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The 2026 edition covers the combined congress of the Nordic Orthopaedic Federation (NOF) and the Danish Orthopaedic Society, held in Copenhagen, 11–13 November 2026.

PROGRAMME OVERVIEW

TUESDAY, 10 NOVEMBER 2026 - PRECOURSE · PARKEN, COPENHAGEN

08:30 – 09:20	Registration
08:45 – 16:45	Damage Control Workshop (parallel to the Precourse parallel sessions and other workshops)
09:20 – 09:35	Welcome
09:40 – 10:10	Parallel session 1: Return from leave
09:40 – 10:10	Parallel session 1: The Future of Orthopaedic Training
09:40 – 10:10	Parallel session 1: Work-life Balance
10:10 – 10:20	Break
10:20 – 10:50	Parallel session 2: Reconstruction - Bones
10:20 – 10:50	Parallel session 2: Balancing the knee
10:20 – 10:50	Parallel session 2: Remodeling in Pediatric Trauma
10:50 – 11:05	Coffee Break
11:05 – 11:35	Parallel session 3: Getting the hip right
11:05 – 11:35	Parallel session 3: Periacetabular Osteotomies
11:05 – 11:35	Parallel session 3: Shoulder Trauma
11:35 – 11:45	Break
11:45 – 12:15	Parallel session 4: Young researcher
11:45 – 12:15	Parallel session 4: PhD - now what?
11:45 – 12:15	Parallel session 4: Building a research group
12:15 – 13:00	Lunch Break
13:00 – 13:05	WORKSHOPS
13:05 – 17:00	Traumatology - Humerus Fractures
13:05 – 17:00	Pediatrics - Growth-plate injuries
13:05 – 17:00	Hand - Flexor tendon repair
13:05 – 17:00	Foot - Multiligament injury
13:05 – 17:00	Infection - Fracture Related Infections
13:05 – 17:00	Arthroplasty - How to do a good Total Hip Arthroplasty
13:05 – 17:00	Sportstraumatology - Meniscus Repair
13:05 – 17:00	Basic Osteosynthesis
17:00 – 17:20	Break
17:20 – 18:00	Beer & Nuts session - Doctors in Elite Sports
18:00 – 19:00	Founding General Assembly - Young NOF
19:30 –	Informal Party (Registration required)

WEDNESDAY, 11 NOVEMBER 2026 · TIVOLI CONGRESS HOTEL

09:00 – 09:45	Symposium: Who gets the Scalpel Next? Culture Change in Nordic Orthopaedics	Congress Hall
09:00 – 09:45	National Society session: Sweden - The Power of Large Register-based RCTs From existing clinical infrastructure to embedded orthopaedic registry trials	Vandsalen
09:00 – 09:45	Symposium: Meta-analyses in Orthopaedics: What can We Trust?	Pjerrot
09:00 – 09:45	**Free Paper session: Sports**	Columbine
09:00 – 09:45	**Free Paper session: Hip Fracture**	Harlekin
09:00 – 09:45	**Free Paper session: Knee Arthroplasty**	Blomster salen
09:00 – 09:45	**Free Paper session: Pediatrics**	Ballon salen
09:45 – 10:00	Break	Exhibition area
10:00 – 10:45	Guildal Lecture: Preparing for War Casualties in the Nordic Perspective	Congress Hall
10:45 – 11:15	Coffee Break in the Exhibition area	
11:15 – 12:00	Symposium: Why Low-value Care remains common in Orthopaedics?	Congress Hall
11:15 – 12:00	National Society session: Estonia - War Medicine and Orthopaedic care	Vandsalen
11:15 – 12:00	Educational Symposium: How do we use simulation to train the best surgeons?	Pjerrot
11:15 – 12:00	**Free Paper session: Hip Arthroplasty**	Columbine
11:15 – 12:00	**Free Paper session: Pediatrics**	Harlekin
11:15 – 12:00	**Free Paper session: Experimental**	Blomster salen
11:15 – 12:00	Closed meeting - Cheflæger	Harlekin
12:00 – 13:00	Lunch in the Exhibition area	
12:15 – 12:45	Lunch Symposium:	Congress Hall
13:00 – 13:45	Symposium: Physician Well-being - Become a Greater Surgeon	Congress Hall
13:00 – 13:45	National Society session: Lithuania - Orthopaedic and Medical Experience in Ukraine: Missions and National Response	Vandsalen
13:00 – 13:45	Meet the Experts: Should we be fixing all clavicle fractures?	Pjerrot
13:00 – 13:45	**Free Paper session: Sports**	Columbine
13:00 – 13:45	**Free Paper session: Knee Arthroplasty**	Harlekin
13:00 – 13:45	**Free Paper session: Foot/Ankle**	Blomster salen
13:00 – 13:45	**Free Paper session: Tumor**	Ballon salen
13:45 – 14:00	Break	Exhibition area
14:00 – 14:45	**YODA/ACTA Best Paper**	Congress Hall
14:00 – 14:45	National Society session: Norway - Overactivity and Low Value Care in Orthopaedics: Choosing wisely	Vandsalen
14:00 – 14:45	Meet the Experts: Tiny Elbows, Big Stress! A practical guide to pediatric fracture success	Pjerrot
14:00 – 14:45	**Free Paper session: Hip Arthroplasty**	Columbine
14:00 – 14:45	**Free Paper session: Trauma**	Harlekin
14:00 – 14:45	**Free Paper session: Spine**	Blomster salen
14:00 – 14:45	Closed meeting - UAO	Harlekin
14:45 – 15:15	Coffee Break in the Exhibition area	
15:15 – 15:30	Opening Ceremony	Congress Hall
15:30 – 16:15	**NOF/DOS Best Paper - The Anders Rydholm Award**	Congress Hall
16:15 – 16:30	Break	Exhibition area
16:30 – 18:00	Poster Walk & Bubbles	Foyer
18:30 – 19:30	YODA General Assembly	

THURSDAY, 12 NOVEMBER 2026 - SUBSPECIALITY DAY · TIVOLI CONGRESS HOTEL

07:30 – 09:00	DOS General Assembly	Congress Hall
09:00 – 09:45	Shoulder/Elbow: Distal Humerus Fracture - A case-based discussion	Arkaden 8
09:00 – 10:30	YNOF/YODA: Meet the Experts (Residents only) - Hip Fractures and how to do it right the first time	Congress Hall
09:00 – 10:30	Trauma: Periprosthetic Fractures in Femur	Vandsalen
09:00 – 10:30	Hip/Knee Arthroplasty: Nordic Arthroplasty Register Association	Pjerrot
09:00 – 10:30	Hand/Wrist: Distal Radius and Forearm Fractures - When the Bone Heals but the Damage Remains I	Columbine
09:00 – 10:30	Sports: ACL injury with concomitant meniscal and MCL injuries	Harlekin
09:00 – 10:30	Infection: Battlefield Lessons: The Fundamentals of Infection Surgery	Blomster salen
09:00 – 10:30	Pediatrics: Perthes Symposium	Ballon salen
09:00 – 10:30	Oncology: Infected Mega-Prosthesis	Arkaden 4+5
09:00 – 10:30	Spine: Treatment of Osteoporotic Fractures	Arkaden 6
09:00 – 10:30	Foot/Ankle: Hallux Valgus - Do's and Don'ts	Arkaden 7
09:45 – 10:30	Shoulder/Elbow: Elbow Arthroplasty for Arthritis - a Case-based discussion	Arkaden 8
10:30 – 11:00	Coffee Break in the Exhibition area	
11:00 – 11:45	Shoulder/Elbow: Shoulder Arthroplasty for Osteoarthritis with Retroversion and Intact Rotator Cuff Function	Arkaden 8
11:00 – 12:30	ACTA Symposium: Ethics in Medical Writing	Congress Hall
11:00 – 12:30	Trauma: Geriatric Fracture Treatment	Vandsalen
11:00 – 12:30	Hip/Knee Arthroplasty: Fast-track Surgery	Pjerrot
11:00 – 12:30	Hand/Wrist: Distal Radius and Forearm Fractures - When the Bone Heals but the Damage Remains II	Columbine
11:00 – 12:30	Sports: Adjunct Procedures and the Posterior-Lateral Knee	Harlekin
11:00 – 12:30	Infection: Preparing for Orthopaedic Infections of War Casualties in the Nordic Perspective	Blomster salen
11:00 – 12:30	Pediatrics: Hip Dysplasia Symposium	Ballon salen
11:00 – 12:30	Oncology: 3D-Printed Implants in Orthopaedic Oncology	Arkaden 4+5
11:00 – 12:30	Spine: Spinal Stenosis with or without Spondylolisthesis	Arkaden 6
11:00 – 12:30	Foot/Ankle: Ankle arthritis	Arkaden 7
11:45 – 12:30	Shoulder/Elbow: Shoulder Arthroplasty for Osteoarthritis in Young Patients	Arkaden 8
12:30 – 13:30	Lunch in the Exhibition area	
12:45 – 13:15	Lunch Symposium:	Congress Hall
13:30 – 14:15	**Trauma: Free Paper session**	Vandsalen
13:30 – 14:15	**Hip/Knee Arthroplasty: Free Paper session**	Pjerrot
13:30 – 14:15	**Hand/Wrist: Free Paper session**	Columbine
13:30 – 14:15	**Sports: Free Paper session**	Harlekin
13:30 – 14:15	**Infection: Free Paper session**	Blomster salen
13:30 – 14:15	**Pediatrics: Free Paper session**	Ballon salen
13:30 – 14:15	**Oncology: Free Paper session**	Arkaden 4+5
13:30 – 14:15	**Spine: Free Paper session**	Arkaden 6
13:30 – 14:15	**Foot/Ankle: Free Paper session**	Arkaden 7
13:30 – 14:15	**Shoulder/Elbow: Free Paper session**	Arkaden 8
14:15 – 14:45	Coffee Break in the Exhibition area	
14:45 – 15:30	Trauma: What is new in Upper Extremity Fractures? Highlight on Nordic Trials	Vandsalen
14:45 – 15:30	Hip/Knee Arthroplasty: Robot Surgery	Pjerrot
14:45 – 15:30	Hand/Wrist: Challenging Cases in Wrist and Forearm Trauma	Columbine
14:45 – 15:30	Sports: Cases	Harlekin
14:45 – 15:30	Infection: Modern Challenges in Orthopaedic Infections	Blomster salen
14:45 – 15:30	Pediatrics: Children's Fracture	Ballon salen
14:45 – 15:30	Oncology: Ongoing Studies in Orthopaedic Oncology in the NOF Countries	Arkaden 4+5
14:45 – 15:30	Spine: State of AI Integration in Spine Registries in the Nordic Countries	Arkaden 6
14:45 – 15:30	Foot/Ankle: 1st ray Pathologies	Arkaden 7
14:45 – 15:30	Shoulder/Elbow: Atraumatic Rotator Cuff Rupture	Arkaden 8
15:30 – 15:45	Break	Exhibition area

15:45 – 17:00	Trauma: Late Night Ortho Trauma Surgery - What is necessary?	Vandsalen
15:45 – 17:00	Danish Hip and Knee Society (DSHK) - General Assembly	Pjerrot
15:45 – 17:00	Danish Society for Hand Surgery (DSfH) - General assembly	Columbine
15:45 – 17:00	Danish Society for Sportstraumatology (SAKS) - General Assembly	Harlekin
15:45 – 17:00	Danish Society for Orthopedic Infections (DSOI) - General Assembly	Blomster salen
15:45 – 17:00	Danish Pediatric Orthopedic Society (DPOS) - General Assembly	Ballon salen
15:45 – 17:00	Danish Group for Sarcoma - General Assembly	Arkaden 4+5
15:45 – 17:00	Danish Orthopedic Spine Society - Spine Cafe	Arkaden 6
15:45 – 17:00	Danish Foot and Ankle Society (DFAS) - General Assembly	Arkaden 7
15:45 – 17:00	Danish Society for Shoulder and Elbow Surgery (DSSAK) - General Assembly	Arkaden 8
19:00 – 23:59	Congress Dinner	Congress Hall

FRIDAY, 13 NOVEMBER 2026 · TIVOLI CONGRESS HOTEL

08:00 – 09:00	NOF General Assembly	Congress Hall
08:00 – 09:00	Danish Society for Traumatology (DOT) - General Assembly	Vandsalen
09:00 – 09:45	Symposium: How to Deal with Psychology in Orthopaedics?	Congress Hall
09:00 – 09:45	National Society session: Finland - Management of Pediatric Patellar Dislocation	Vandsalen
09:00 – 09:45	Quality Symposium: Is the Future Guidelines by AI?	Pjerrot
09:00 – 09:45	**Free Paper session: Hip Arthroplasty**	Columbine
09:00 – 09:45	**Free Paper session: Trauma**	Harlekin
09:00 – 09:45	**Free Paper session: Shoulder/Elbow**	Blomster salen
09:00 – 09:45	**Free Paper session: Experimental**	Ballon salen
09:45 – 10:15	Coffee Break in the Exhibition Area	
10:15 – 11:00	DOS/NOF Honorary Lecture: AI and Digital Solutions for Public Health-care systems: A Nordic Perspective	Congress Hall
11:00 – 11:30	Break	Exhibition area
11:30 – 12:15	Symposium: Fragility Fracture Network (FFN) in the NOF countries – the role of orthopedic surgeons	Congress Hall
11:30 – 12:15	National Society session: Iceland - ACL reconstruction in iceland, incidence, trend in graft choice, 5 - year revision rate and current clinical practice	Vandsalen
11:30 – 12:15	Symposium: Hype, hope or hallucinations – What is the role of AI, personalization and robotics in modern orthopaedics?	Pjerrot
11:30 – 12:15	**Free Paper session: Sports**	Columbine
11:30 – 12:15	**Free Paper session: Trauma**	Harlekin
11:30 – 12:15	**Free Paper session: Knee Arthroplasty**	Blomster salen
11:30 – 12:15	Closed meeting (Inspektor)	Harlekin
12:15 – 13:15	Lunch in the Exhibition area	
12:30 – 13:00	Lunch Symposium	Congress Hall
13:15 – 14:00	Symposium: Best practice treatment of patellofemoral instability (PFI)	Congress Hall
13:15 – 14:00	National Society session: the Netherlands - Quality Registries: Shared Learning and Collective Improvement	Vandsalen
13:15 – 14:00	ACTA Symposium: The Perfect Study Design in Orthopaedic and Traumatological Research	Pjerrot
13:15 – 14:00	**Free Paper session: Knee Arthroplasty**	Columbine
13:15 – 14:00	**Free Paper session: Hip Fracture**	Harlekin
13:15 – 14:00	**Free Paper session: Pediatrics**	Blomster salen
13:15 – 14:00	**Free Paper session: Infection/Amputation**	Ballon salen
14:00 – 14:15	Coffee Break in the Exhibition Area	
14:15 – 15:15	The Great Nordic Battle - Surgery or Not?	Congress Hall
15:15 – 15:30	Closing Ceremony	Congress Hall

SESSIONS WITH ABSTRACTS

WEDNESDAY, 11 NOVEMBER 2026

Session 1	09:00 – 09:45	Free Paper Session – Sports	Columbine	1–5
Session 2	09:00 – 09:45	Free Paper Session – Hip Fracture	Harlekin	6–10
Session 3	09:00 – 09:45	Free Paper Session – Knee Arthroplasty	Blomster salen	11–15
Session 4	09:00 – 09:45	Free Paper Session – Pediatrics	Ballon salen	16–20
Session 5	11:15 – 12:00	Free Paper Session – Hip Arthroplasty	Columbine	21–25
Session 6	11:15 – 12:00	Free Paper Session – Pediatrics	Harlekin	26–30
Session 7	11:15 – 12:00	Free Paper Session – Experimental	Blomster salen	31–32, 34–35, 137
Session 8	13:00 – 13:45	Free Paper Session – Sports	Columbine	36–40
Session 9	13:00 – 13:45	Free Paper Session – Knee Arthroplasty	Harlekin	41–45
Session 10	13:00 – 13:45	Free Paper Session – Foot/Ankle	Blomster salen	46–50
Session 11	13:00 – 13:45	Free Paper Session – Tumor	Ballon salen	52–55, 102
Session 12	14:00 – 14:45	YODA/ACTA Best Paper	Congress Hall	182–186
Session 13	14:00 – 14:45	Free Paper Session – Hip Arthroplasty	Columbine	56–60
Session 14	14:00 – 14:45	Free Paper Session – Trauma	Harlekin	61–65
Session 15	14:00 – 14:45	Free Paper Session – Spine	Blomster salen	66–71
Session 16	15:30 – 16:15	NOF/DOS Best Paper - The Anders Rydholm Award	Congress Hall	177–181

THURSDAY, 12 NOVEMBER 2026

Session 17	13:30 – 14:15	Free Paper Session – Trauma	Vandsalen	72–76
Session 18	13:30 – 14:15	Free Paper Session – Hip/Knee Arthroplasty	Pjerrot	77–81
Session 19	13:30 – 14:15	Free Paper Session – Hand/Wrist	Columbine	82–86
Session 20	13:30 – 14:15	Free Paper Session – Sports	Harlekin	87–91
Session 21	13:30 – 14:15	Free Paper Session – Infection	Blomster salen	92–93, 174, 95–96
Session 22	13:30 – 14:15	Free Paper Session – Pediatrics	Ballon salen	97–101
Session 23	13:30 – 14:15	Free Paper Session – Oncology	Arkaden 4+5	51, 103–106
Session 24	13:30 – 14:15	Free Paper Session – Spine	Arkaden 6	107–111
Session 25	13:30 – 14:15	Free Paper Session – Foot/Ankle	Arkaden 7	112–116
Session 26	13:30 – 14:15	Free Paper Session – Shoulder/Elbow	Arkaden 8	117–121

FRIDAY, 13 NOVEMBER 2026

Session 27	09:00 – 09:45	Free Paper Session – Hip Arthroplasty	Columbine	122–126
Session 28	09:00 – 09:45	Free Paper Session – Trauma	Harlekin	127–131
Session 29	09:00 – 09:45	Free Paper Session – Shoulder/Elbow	Blomster salen	132–136
Session 30	09:00 – 09:45	Free Paper Session – Experimental	Ballon salen	33, 138–141
Session 31	11:30 – 12:15	Free Paper Session – Sports	Columbine	142–146
Session 32	11:30 – 12:15	Free Paper Session – Trauma	Harlekin	147–151
Session 33	11:30 – 12:15	Free Paper Session – Knee Arthroplasty	Blomster salen	152–156
Session 34	13:15 – 14:00	Free Paper Session – Knee Arthroplasty	Columbine	157–161
Session 35	13:15 – 14:00	Free Paper Session – Hip Fracture	Harlekin	162–166
Session 36	13:15 – 14:00	Free Paper Session – Pediatrics	Blomster salen	167–171
Session 37	13:15 – 14:00	Free Paper Session – Infection/Amputation	Ballon salen	172–173, 94, 175–176

POSTER WALK & BUBBLES — WEDNESDAY, 11 NOVEMBER 2026, 16:30 – 18:00, FOYER

Walk 1	16:30 – 18:00	Tumor	Foyer	200–209
Walk 2	16:30 – 18:00	Trauma 1	Foyer	210–219

Walk 3	16:30 – 18:00	Trauma 2	Foyer	220–229
Walk 4	16:30 – 18:00	Trauma 3	Foyer	230–239
Walk 5	16:30 – 18:00	Trauma 4	Foyer	240–249, 387
Walk 6	16:30 – 18:00	Sports Orthopaedics / Arthroscopy 1	Foyer	250–259
Walk 7	16:30 – 18:00	Sports Orthopaedics / Arthroscopy 2	Foyer	260–269
Walk 8	16:30 – 18:00	Spine	Foyer	270–279
Walk 9	16:30 – 18:00	Shoulder/Elbow	Foyer	280–281, 283–289
Walk 10	16:30 – 18:00	Pediatrics 1	Foyer	290–299
Walk 11	16:30 – 18:00	Pediatrics 2	Foyer	300–307, 388
Walk 12	16:30 – 18:00	Knee Arthroplasty 1	Foyer	308–317
Walk 13	16:30 – 18:00	Knee Arthroplasty 2	Foyer	318–326
Walk 14	16:30 – 18:00	Knee Arthroplasty 3	Foyer	327–335
Walk 15	16:30 – 18:00	Hip Arthroplasty 1	Foyer	336–342, 344–345
Walk 16	16:30 – 18:00	Hip Arthroplasty 2	Foyer	346–355
Walk 17	16:30 – 18:00	Infection/Amputation	Foyer	356–358, 360–365
Walk 18	16:30 – 18:00	Foot/Ankle	Foyer	366–374
Walk 19	16:30 – 18:00	Experimental/Non-clinical	Foyer	375–386

SESSION 1: FREE PAPER SESSION – SPORTS

Wednesday, 11 November 2026

09:00 – 09:45

Room: Columbine

Chairs:

Rune Bruhn Jakobsen
Department of Orthopedic Surgery, Akershus University Hospital, Norway

Kristoffer Weisskirchner Barfod
Section for Sports Traumatology, Department of Orthopaedic Surgery, Copenhagen University Hospital Bispebjerg-Frederiksberg

1. Effectiveness of Supervised Strengthening Exercise Compared to Usual Care on Hip-Related Quality of Life for Patients with Femoroacetabular Impingement Syndrome: A Randomised Controlled Trial

Frederik Nicolai Foldager[1,2], Signe Kierkegaard-Brøchner[3], Bent Lund[3], Mathias Høgsholt[2,3], Stian Langgård Jørgensen[3], Martin Gade Stisen[2,4], Bjarne Mygind-Klavsen[5], Ulrik Dalgas[6], Bo Martin Bibby[7], Jens Kristinsson[8], Carsten Mølgaard[9, 10], Kristian Thorborg[11], Laura Mønsted Krohn[11], Maurits van Tulder[12], Mark Scholes[13, 14], Georgia Coburn[13], Diogo Gomes[13], Joanne Kemp[13], Inger Mechlenburg[1,2]

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Background: Physiotherapist-led, non-surgical management is recommended as first-line treatment for femoroacetabular impingement syndrome (FAIS). It remains unclear whether six months of a structured, progressive, supervised strengthening programme provides a clinically superior improvement beyond usual care.

Aim: To evaluate if a six-month supervised strengthening program is clinically superior to usual care in improving hip-related quality of life (QoL) at six months in adults with FAIS.

Materials and Methods: Multicentre, parallel-group, assessor-blinded randomised superiority trial in Denmark and Australia. Adults with FAIS were randomised 1:1 to supervised strengthening or usual care (n=120; 60 per group). Supervised strengthening comprised up to 12 physiotherapy sessions over six months, plus home- or gym-based exercise. Usual care comprised a physiotherapy referral and written advice aligned with WHO physical activity recommendations. The primary outcome was change in hip-related QoL at 6 months, measured with the International Hip Outcome Tool-33 (iHOT-33). Superiority was predefined as the lower limit of the 95% confidence interval (95% CI) for the between-group difference exceeding 6.1 points (MCID). A supplementary analysis assessed the proportion achieving a minimally important change (MIC) of 8.7 points. Analyses followed the intention-to-treat principle and used linear mixed-effects models.

Results: At six months, the supervised strengthening group improved by 12.3 (95% CI 8.2 to 16.3) points on the iHOT-33, while the usual care group improved by 5.5 points (95% CI 1.5 to 9.5). The between-group difference in change was 6.8 points (95% CI 1.0 to 12.5), which did not meet the superiority criterion. The proportion of participants achieving a MIC was 58.5% (95% CI 38.0 to 90.0) with supervised strengthening and 35.7% (95% CI 22.6 to 56.3) with usual care, corresponding to a between-group difference of 22.8 percentage points (95% CI −3.1 to 48.7).

Interpretation / Conclusion: Supervised strengthening was not conclusively clinically superior to usual care for improving hip-related QoL at 6 months in adults with FAIS.

2. Clinical Effects of Eccentric Training and Neurodynamic Sliding on Strength, Balance, and Proprioception in Athletes with Hamstring Shortness

Mohammad Ebrahimi[1], Nilüfer cerbezer [1], Elif Tuğçe Çil Sertöz[1]
Yeditepe University, Physiotherapy and Rehabilitation Department, İstanbul-Turkey

Background: Hamstring shortness is a common issue among female athletes, potentially leading to reduced performance and increased injury risk. Eccentric exercises and neurodynamic sliding techniques are two interventions known to improve muscle flexibility and joint function.
Aim: This study aimed to compare the effects of eccentric training (ET), Neurodynamic Sliding Technique (NST), their combination (ETNST), and a control group on strength, balance, and proprioception in female athletes with hamstring shortness.
Materials and Methods: A randomized controlled trial was conducted with 90 athletes randomly assigned to one of four groups: ET, NST, ETNST, or control. Interventions were carried out over six weeks. Primary outcomes included dynamic balance (Y Balance Test), knee joint range of motion (Straight Leg Raise test), isokinetic strength of knee flexors and extensors, and knee joint proprioception.
Results: 60 athletes completed the study. The ETNST group demonstrated significantly greater improvements in dynamic balance ($p = 0.033$), knee flexion range of motion ($p < 0.001$), and isokinetic strength of knee flexors and extensors ($p < 0.001$) compared to the other groups. Although the ETNST group showed greater improvement in knee joint proprioception, between-group differences were not statistically significant ($p = 0.935$). Both the ET and NST groups showed significant improvements over the control group in several outcomes ($p < 0.05$); however, the combined ETNST protocol yielded the most pronounced overall effects.
Interpretation / Conclusion: The combination of eccentric training and the Neurodynamic Sliding Technique produced the most significant improvements in balance, knee joint range of motion, and strength parameters in female athletes with hamstring shortness. This combined approach can be recommended for rehabilitation and injury prevention programs.

3. Patients with borderline dysplasia and acetabular retroversion can expect similar results after hip arthroscopy with labral repair as patients without underlaying pathology - subgroup analysis of 380 consecutive patients

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Background: Hip arthroscopy with labral repair for patients with femoral-acetabular impingement (FAIS) has been performed at Bispebjerg Frederiksberg Hospital for over 10 years.
Aim: To report the two-year outcome for different subgroups of patients treated with hip arthroscopy and labral repair.
Materials and Methods: From January 2014 to January 2024 patients treated with hip arthroscopy and labral repair at Bispebjerg-Frederiksberg Hospital were followed prospectively using Hip and Groin Outcome Score (HAGOS) with follow-up after 4, 8, 12 weeks, one and two years. The population was divided in the following subgroups: No concomitant pathology, early osteoarthritis (OA) (≥Toennis 2), borderline hip dysplasia, acetabular retroversion (AR) and previous periacetabular osteotomy (PAO), as well as age by the time of surgery (<20 yrs., 21-49yrs., >50yrs.).
Results: Hip arthroscopy with labral repair was performed on 380 consecutive patients (54% female, mean (SD) age 39.8 (14.2) years). Across all subgroups statistically significant improvement from baseline were reported in all HAGOS domains two years post-operatively ($p<0.0001$). In-between group differences were most pronounced in HAGOS Physical Activity (PA) and Quality of Life (QoL). Improvements from baseline were mean [95% confidence interval]: Without pathology PA 34.4 [28.3;40.5], QoL 31.8 [27.3;36.2]. Borderline dysplasia PA 41.5 [20.6; 62.5], QoL 31.8 [16.5;47.1]. Early OA PA 22.1 [-0.1;44.3], QoL 13.0 [-3.1;29.2]. Previous PAO PA 8.3 [-9.4;26.0], QoL 10.4 [-2.5; 23.4]. AR PA 21.5 [10.8;32.3], QoL 23.9 [16.0;31.7]. No difference in clinical outcome regarding age by the time of surgery (<20 yrs., 21-49yrs., >50yrs.) was reported.
Interpretation / Conclusion: Clinically relevant improvements in patient-reported function (HAGOS) in patients after hip arthroscopy with labral repair for FAIS are reported across all subgroups two years post-operatively. While patients with early OA and previous PAO report less optimal outcome, patients with borderline dysplasia report similar results compared to patients without underlaying pathology. Age by surgery did not affect the clinical outcome negatively.

4. Supplementary Procedures in Anterior Cruciate Ligament Reconstruction in Denmark. A Study from The Danish Knee Ligament Reconstruction Register.

Magnus Ravn[1], Kaldau Niels Christian [1], Hölmich Per[1], Witten Adam[1]
1. Sports Orthopedic Research Center – Copenhagen (SORC-C), Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Denmark

Background: Anterior cruciate ligament reconstruction (ACLR) is a commonly performed procedure. Emerging evidence suggests that addressing associated meniscal ramp and root lesions, as well as adding lateral extra-articular tenodesis (LET), may improve outcomes after ACL reconstruction (ACLR). However, the effect and potential complications associated with these supplementary procedures are not fully understood.
Aim: To describe the use of supplementary procedures in primary ACLR in Denmark, and to investigate differences in outcomes between patients undergoing ACLR with and without LET.
Materials and Methods: Data for this study was obtained from the Danish Knee Ligament Reconstruction Register (DKRR) and included all primary anterior cruciate ligament reconstructions (ACLR) performed between 2017 and 2025. Self-reported outcomes 1-year postoperatively and complication rates between patients undergoing ACLR with and without LET were analyzed using unpaired t-test and Chi-square test, respectively.
Results: Data from 6798 adult patients was included in the analysis. Since 2018, the use of lateral extra-articular tenodesis (LET) has increased at an exponential rate (R2 = 0.99), now being performed in 13% of primary ACLR in Denmark. Surgical management of associated ramp lesions and meniscal root tears has shown a steady linear increase over the same period, now performed in 3% and 4% of ACLR, respectively. One year after ACLR, the LET group had a higher mean Knee injury and Osteoarthritis Outcome Score (KOOS-4) compared with the non-LET group (74 vs 70; p = 0.008), but also a higher risk of non-operative complications (20% vs 14%; relative risk 1.42, 95% CI 1.06–1.90). No significant difference was observed in reoperation rates within the first year (4% vs 5%; p = 0.44). Data were insufficient to compare 2-year revision rates between the groups.
Interpretation / Conclusion: Supplementary procedures in primary ACLR have increased markedly over the past years, especially LET. At this early stage of LET implementation in Denmark, LET seems to be associated with a higher risk of postoperative complications, but also a small improvement in KOOS-4.

5. Isolated versus combined medial patellofemoral ligament reconstruction: Radiological characteristics and outcomes in a multicentre cohort

Torsten Grønbech Nielsen[1,2,3], Bjørn Borsøe Christensen[3,4], Ole Gade Sørensen[1], David Kocemba[3,4], Pia Kjær Kristensen[3], Martin Lind[1,3]
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Background: Recurrent patellar dislocation is commonly treated with medial patellofemoral ligament (MPFL) reconstruction, but indications for isolated versus combined procedures remain heterogeneous.
Aim: The purpose of this study was to describe patient demographics and injury characteristics, preoperative radiological risk factors, and postoperative outcomes following MPFL reconstruction, including patient-reported instability (dislocation/subluxation) and revision surgery.
Materials and Methods: This multicentre retrospective cohort included patients who underwent MPFL reconstruction between 2010 and 2024 at five public hospitals in the Central Denmark Region. Procedures included isolated MPFL reconstruction and combined procedures with tibial tuberosity transfer osteotomy (TTO) and/or trochleoplasty (TP). After consent, medical records were reviewed to identify postoperative dislocation, subluxation, and revision surgery, and participants completed the Kujala and Banff Patella Instability Instrument (BPII 2.0) questionnaires. Preoperative imaging assessed trochlear morphology, patella morphology and tibial tubercle position. Postoperative dislocation, subluxation and revision surgery were recorded.
Results: Of 1,564 eligible patients, 910 (58%) participated, representing 1,050 knees and with mean follow-up of 7.2 years. Mean age was 22.1 years and 30% were male. Isolated MPFL reconstruction accounted for 71% of procedures, MPFL+TTO for 25% and MPFL+TP±TTO for 4%. Combined procedures were performed in patients with more pronounced trochlear dysplasia, patella alta and increased TT–TG distance. Redislocation occurred in 11%, 7% and 5%, and revision surgery in 7%, 2% and 0%, respectively. Mean Kujala scores were 75, 74 and 77, and mean BPII 2.0 scores were 58, 58 and 57, respectively.
Interpretation / Conclusion: Isolated MPFL reconstruction was the most common procedure. Combined procedures were used in patients with more pronounced radiological risk factors and showed lower rates of redislocation and revision surgery, while Kujala and BPII 2.0 scores were comparable across procedures.

SESSION 2: FREE PAPER SESSION – HIP FRACTURE

Wednesday, 11 November 2026

09:00 – 09:45

Room: Harlekin

Chairs:

Ann Kristin Hansen
Department of Orthopaedic Surgery, University Hospital of North Norway, Norway

Bjarke Viberg
Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark

6. Mental disorders and osteoporosis treatment in patients with hip fracture – a Danish population-based cohort study

Rikke Sommer Haaber[1,2], Bente Langdahl[2,3], Rob Nelissen[4], Simon Storgaard Jensen[1,2], Kjeld Andersen[5], Alma B. Pedersen[1,2]

1. Department of Clinical Epidemiology, Aarhus University Hospital, Denmark 2. Institute of Clinical Medicine, Aarhus University, Denmark 3. Department of Endocrinology and Internal Medicine, Aarhus University Hospital, Denmark 4. Department of Orthopedics, Leiden University Medical Center, the Netherlands 5. Department of Psychiatry, Odense University Hospital, Denmark

Background: Identifying vulnerable groups that could benefit from stratified care is essential to closing the documented treatment gap in secondary prevention of osteoporotic fractures.
Aim: To evaluate the impact of mental disorders on initiation of anti-osteoporosis medication (AOM) following hip fracture.
Materials and Methods: Using Danish medical registries, we identified patients aged ≥65, with no recent AOM use and a first-time hip fracture between 2010 and 2020 (n=57,887). Mental disorders were categorized using 10-year history of hospital contacts into no mental disorder, organic mental disorders, substance use, schizophrenic, mood, and anxiety disorders. Outcome was initiation of AOM defined by pharmacy dispensations and hospital treatment codes. Among patients without AOM use in the year prior to hip fracture, 1-year cumulative incidence functions (CIF) with 95% confidence intervals of initiation of AOM with death as competing risk were calculated.
Results: The 1-year CIF of initiation of AOM after hip fracture was 20.8% (20.4-21.1) for patients with no mental disorder, 6.5% (6.0-7.1) for organic mental disorders, 17.0% (15.6-18.5) for substance use, 11.5% (9.5-13.8) for schizophrenic, 14.8% (13.8- 15.8) for mood, and 16.1% (14.4-17.9) for anxiety disorders.
Interpretation / Conclusion: Patients with mental disorders were less likely to initiate AOM after hip fracture, highlighting a persistent gap in secondary fracture prevention among vulnerable populations.

7. Reoperation After Internal Fixation of Femoral Neck Fractures in Adults <65 Years: A Danish Nationwide Register-Based Study

Michaela Manalili Hansen[1], Anna Trier Heiberg Brix[1], Per Gundtoft[2], Bjarke Viberg
1. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark 2. Department of Orthopaedic Surgery and Traumatology, Aarhus University Hospital, Denmark

Background: Internal fixation is preferred for femoral neck fractures in non-elderly adults, but failure rates remain substantial, and comparative evidence between implant constructs is limited.
Aim: To compare reoperation after internal fixation with sliding hip screw (SHS) versus cancellous screws (CS) in adults with a femoral neck fracture aged <65 years.
Materials and Methods: In this nationwide register-based cohort study, we included adults aged 20-64 years treated with internal fixation for femoral neck fractures between 1998 and 2021, grouped by implant type, SHS (KNFJ60+80) or CS (KNFJ40+70). The primary outcome was any reoperation, analysed as 1-, 2-, and 10-year cumulative incidence. Adjusted associations were estimated using Fine-Gray regression and reported as subdistribution hazard ratios (SHR). The secondary outcome was conversion to arthroplasty. All estimates are given with 95% confidence interval.
Results: A total of 9,239 patients were included; 2,853 (31%) were treated with SHS and 6,386 (69%) with CCS. Overall, 1,712 (18.5%) patients were <50 years and 7,527 (81.5%) were 50-64 years. Comorbidity burden was similar between groups. At 1 year, the cumulative incidence of reoperation was 19.8% (18.3-21.3) after SHS and 27.8% (26.8-29.0) after CS. At 2 years it was 30.4% (28.7-32.0) versus 41.6% (40.4- 42.8) and the difference was unchanged up to 10 years with 37.9% (36.1-39.7) versus 49.2% (48.0-50.5). This corresponded to a relative risk of reoperation with CS compared to SHS of 1.40 (95% CI 1.29-1.53) at 1 year, 1.37 (95% CI 1.29-1.46) at 2 years, and 1.28 (95% CI 1.22- 1.35) at 10 years. In adjusted analyses, CS was independently associated with a higher adjusted relative risk of reoperation (SHR 1.37, 1.28- 1.47). For the secondary outcome, conversion to arthroplasty occurred in 27.8% (26.1-29.4) after SHS and 32.4% (31.3-33.6) after CS.
Interpretation / Conclusion: In this nationwide cohort of adults aged <65 years with a femoral neck fracture, SHS was associated with a lower cumulative incidence of reoperation than CS over 10 years follow-up. This association persisted after adjustment and was accompanied by fewer conversions to arthroplasty, suggesting more durable fixation with SHS.

8. Impact and Resource Use of Standardized Coordinated Care Following Hip Fracture in Nursing Homes

Mads Nielsen[1], Ditte Jepsen[2], Charlotte Jensen[1], Jonas Ipsen[1,3], Frede Frihagen[4,5], Bjarke Viberg[1]
1. Department of Orthopaedic Surgery and Traumatology, and Clinical Research, Odense University Hospital, Odense and Svendborg, Region of Southern Denmark, Denmark. 2. Department of Geriatrics, Odense University Hospital, Odense, Region of Southern Denmark, Denmark. 3. Department of Regional Health Research, University of Southern Denmark, Odense, Region of Southern Denmark, Denmark. 4. Department of Orthopaedic Surgery and Traumatology, Østfold Hospital Trust, Norway. 5. Oslo University Hospital, Oslo, Norway.

Background: Nursing home (NH) residents who sustain hip fractures have high rates of early readmission and mortality following hospital discharge. An Enhanced Standardized Interdisciplinary Cooperation (ESIC) model was politically mandated for implementation; however, the original model was resource intensive. In collaboration with municipalities, an optimized ESIC model for NH care was therefore designed to be more pragmatic and less resource-intensive, supported by video-based educational materials for the healthcare staff.
Aim: To evaluate the effect of the optimized ESIC on 30-day readmission, 30-day mortality, and intervention-related time-use following hip fracture surgery.
Materials and Methods: This prospective, non-randomized stepped wedge trial included NH residents aged ≥ 65 years discharged after hip fracture surgery between September 2023 and May 2025. The ESIC model included daily monitoring of vital signs for three days, fluid registration, bowel and urinary assessment, and mobilization. A stop-and-evaluate checkpoint was included on day 3 and involved an acute nurse visit to determine whether monitoring should continue. The orthopaedic department provided an extended treatment responsibility for 14 days after discharge. The intervention was introduced sequentially every three months and continued until sample size was reached. Primary outcome was 30-day readmission; secondary outcomes were 30-day mortality and time-use related to intervention tasks.
Results: A total of 245 patients were included (intervention n=140; control n=105). Thirty-day readmission did not differ between groups (26% vs 27%, p=0.967). Thirty-day mortality was 9% in the ESIC group and 18% in controls, yielding an unadjusted OR of 0.46 (CI 0.21-0.99) and adjusted OR of 0.55 (CI 0.21- 1.39). Time-use was approximately 15 minutes per resident per day, and 30 minutes on day 3.
Interpretation / Conclusion: The optimized ESIC-model did not affect readmission rates but was time-efficient and associated with a lower crude 30-day mortality. However, the adjusted analyses were non-significant, possibly due to baseline imbalance and limited statistical power related to the small sample size.

9. Effect and cost of structured and coordinated care after hip fracture

Jonas Ipsen[1,2,3,4], Donna Lykke Wolff [1,2,5], Maria klitgaard Christensen [1,6], Sofie Ronja Petersen [2,4], Bjarke Viberg [3,4], Carl Llor [1,2,7], Mette Elkjaer [1,2,8]

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Background: Hip fracture is increasing with population ageing, placing growing demands on post-discharge care. An intervention previously shown to reduce 30-day mortality and readmissions among nursing home residents was implemented across hospitals and municipalities in the Region of Southern Denmark for both nursing home and community-dwelling patients after hip fracture.
Aim: To evaluate the effectiveness and cost-effectiveness of this implementation compared with usual care.
Materials and Methods: We conducted a prospective multicentre cohort study of patients aged ≥65 years undergoing hip fracture surgery between January 2022 and June 2025 (implementation started November 2023). Patients were identified using diagnosis and procedure codes. Enrolment was identified in patient records and, when possible, validated by municipalities. The intervention consisted of a 14-day structured post-discharge program with systematic monitoring (vital signs, weight, pain), mandatory follow-up visits by municipal nurses, and access to hospital consultation, combined with extended medical responsibility at the hospital. The primary outcome was 30-day mortality. Secondary outcomes included 30-day readmission, 3-month healthcare costs, number needed to treat (NNT), and incremental cost per life saved. Average treatment effects were estimated using targeted maximum likelihood estimation for mortality and g-computation for readmission and costs.
Results: A total of 2,609 patients were included (mean age 82 years; 67% female), of whom 524 received the intervention. Thirty-day mortality was lower in the intervention group (8.0% vs 11.9%; OR 0.60, 95% CI 0.37–0.85), corresponding to a NNT of 19. Readmissions were higher in the intervention group (18.6% vs 13.6%; RR 1.28, 95% CI 1.05–1.56). Mean 3-month costs were €1,079 higher in the intervention group (95% CI €395–€1,767), resulting in an incremental cost of €21,590 per life saved.
Interpretation / Conclusion: Implementation of structured post-discharge monitoring reduced 30-day mortality but increased readmissions and short-term costs after hip fracture. The intervention was cost-effective under common thresholds, supporting its use in post-discharge care pathways.

10. Narrative KKR - Operative treatment of femoral neck fractures in adults, a narrative guideline

Lena Hansen[1], Mette Rosenstand[1], Mathias Kvist Mejdahl[2], Stefan Arni H. Gudjohnsen[1]
1. Department of Orthopaedics, Aalborg University Hospital, Denmark; 2. Department of Orthopaedics, Copenhagen University Hospital - Hvidovre, Denmark

Background: Femoral neck fractures in adults represent a spectrum of disease dependent on multiple factors such as the patient's age, physiologic status and the amount of energy involved in the injury. Globally there is great variation in the operative management of these injuries with the primary modalities utilized being Internal Fixation (IF), Hemi Arthroplasty (HA) and Total Hip Arthroplasty (THA), all of which can be relevant depending on the previously mentioned factors.
Aim: To summarize and provide guidance on the relevant factors for successful operative management of femoral neck fractures in accordance with the latest evidence.
Materials and Methods: A systematic literature search focusing on systematic reviews and guidelines on the operative treatment of femoral neck fractures published in the last 5 years was conducted in Pubmed, Cochrane database of systematic reviews and Guidelines international network's International guideline library with additional relevant studies and guidelines being identified in the referenced literature. Quality assessment was conducted using AGREE-II for guidelines, ROBINS-I for RCS's and AMSTAR-2 for systematic reviews. Final assessment was performed using GRADE where applicable and oxford levels of evidence.
Results: 3 Guidelines of sufficient methodological quality were identified as well as 4 relevant Cochrane reviews and an educational article authored by a multinational group of experts which was equated to an expert opinion guideline. By cross referencing these with the additional studies identified in our search, 3 retrospective cohort studies (RCS) and 8 systematic reviews were identified, representing the published literature since the publication of the included guidelines. Recommendations from the included guidelines with sufficient quality of evidence are included in this guideline with modifications based on included literature. Further recommendations are presented as best practice recommendations.
Interpretation / Conclusion: This Guideline builds upon previous guidelines and provides recommendations on the operative management of femoral neck fractures based on the latest available evidence as well as providing recommendations for areas requiring further study.

SESSION 3: FREE PAPER SESSION – KNEE ARTHROPLASTY

Wednesday, 11 November 2026

09:00 – 09:45

Room: Blomster salen

Chairs:

Christian Bredgaard Jensen
Department of Orthopaedic Surgery, Copenhagen University Hospital Hvidovre, Copenhagen, Denmark

Christian Skovgaard Nielsen
Department of Orthopaedic Surgery, Copenhagen University Hospital – Hvidovre, Denmark

11. Risk of revision and other complications following knee arthroplasty in patients previously exposed to bariatric surgeries: A nationwide, register-based study

Saber Muthanna Aljuboori[1,2,3], Janne Petersen [4,5], Robin Christensen [2,6], Espen Jimenez-Solem [3,4], Line Lund Kårhus [7], Søren Overgaard [1,3]

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Background: Obesity is a major risk factor for knee osteoarthritis (KOA). Bariatric surgery (BAS) effectively induces weight loss, but some of these patients subsequently require knee arthroplasty (KA) despite substantial weight reduction. However, the impact of prior BAS on the risk of revision, antibiotic use, and mortality following KA, remains unclear.

Aim: To evaluate the impact of prior BAS on the risk of revision, antibiotic use, and mortality after KA in patients with KOA, compared with patients undergoing KA without prior BAS, and to examine whether body mass index (BMI) at the time of KA modifies these effects.

Materials and Methods: We conducted a nationwide, register-based cohort study analyzing patients undergoing primary KA. KOA patients with prior BAS were propensity score-matched to a control group based on health and socioeconomic data. Using Cox regression models, we compared hazard ratios (HR) for outcomes, including: (1) revision rates (within 90 days and 2 years), (2) antibiotic use (knee-related and non-knee-related, within 30 and 90 days), and (3) mortality (within 2 years). We stratified by obesity status at time of surgery (non-obese, obese, morbidly obese) and arthroplasty type (total and medial unicondylar).

Results: Among 99,965 patients having KA, 1,448 had prior BAS, and 98,517 did not. After matching, 1427 BAS KOA patients were compared with 6,194 KOA controls. Patients exposed to earlier BAS showed no statistical difference in 90-day revision rates (9 [0.6%] vs. 52 [0.8%], HR: 0.75, 95% CI: 0.37 to 1.52) or 2-year revision rates (43 [3,0%] vs. 195 [3,2%], HR: 0.95, 95% CI: 0.69 to 1.33). None of revision due to infection, use of antibiotics and mortality differed between groups.

Interpretation / Conclusion: No differences were observed in the risk of revision within 2 years, antibiotic use, or mortality between patients with and without prior BAS before KA.

12. Optimizing analgesia after Total Knee Arthroplasty: Does increasing local anesthetic volume improve Popliteal Plexus Block efficacy?

Johan Kløvgaard Sørensen[1,2], Mikkel Schjødt Heide Jensen[1,2], Ulrik Grevstad[4], Lone Nikolajsen[2,3], Charlotte Runge[1,2]

1. University Research Clinic for Interdisciplinary Orthopedic Pathways, Elective Surgery Centre, Regional Hospital Central Jutland, Silkeborg, Denmark 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark 3. Department of Anesthesiology, Aarhus University Hospital, Aarhus, Denmark 4. Department of Anesthesia, Gentofte Hospital, Gentofte, Denmark

Background: The Popliteal Plexus Block (PPB) is a novel regional anesthetic technique targeting sensory nerves innervating the posterior knee capsule and intra-articular structures. When added to modern multimodal analgesia following total knee arthroplasty (TKA) in combination with regional anesthetic techniques targeting the anterior capsule, PPB reduces posterior knee pain and postoperative opioid consumption without compromising early mobilization. However, the optimal volume of local anesthetic for PPB remains unknown.
Aim: This trial aimed to determine if 20 mL of local anesthetics for PPB provides superior analgesic efficacy and early functional outcomes compared with 10 mL after TKA.
Materials and Methods: In this single-center, blinded, randomized controlled trial, 120 adults undergoing primary unilateral TKA were randomized to receive PPB with either 10 mL or 20 mL of bupivacaine 5 mg/mL, in addition to a standardized multimodal analgesic regimen including a femoral triangle block. Primary outcome was 24-hour cumulative opioid consumption. Secondary outcomes included the proportion of patients with no opioid-use within 0-24 hours postoperatively, pain scores, early functional outcomes, and patient-reported Quality of Recovery-15.
Results: No statistically significant or clinically relevant differences were observed between the two groups in 24-hour postoperative opioid consumption (median 15 [IQR 3.75-30] vs. 15 mg [IQR 0-30] oral morphine milligram equivalents; median difference 0 mg, 95% CI -10 to 5; p=0.6). Moreover, no differences were observed within the first 24 hours after surgery in the proportion of patients with no opioid use (25% vs. 33%; p = 0.4), overall pain at rest or during ambulation, ability to ambulate with crutches, adverse motor impairment, or Quality of Recovery-15 scores. 95% of patients in both groups had successful same-day discharge after surgery.
Interpretation / Conclusion: Use of 20 mL of local anesthetic for PPB does not improve postoperative analgesia or early functional outcomes compared with 10 mL following TKA. Consistent with the principle of using the lowest effective dose, these findings support the use of 10 mL of local anesthetic for PPB in clinical practice and further research.

13. Association between postoperative benzodiazepine and opioid use and the risk of periprosthetic fracture–related revision and mortality after hip and knee arthroplasty

Manuela Yepes-Calderón[1,2], Melisa Castaneda-Vanegas[1], Hein Putter[3], Marcel L. Bouvy[4], Liza N. van Steenbergen[5], Albert Dahan[6], Frits R. Rosendaal[2], Rob G.H.H. Nelissen[1,5], Maaike G.J. Gademan[1,2]
1. Department of Orthopedics, Leiden University Medical Center, Leiden, The Netherlands; 2. Department of Clinical Epidemiology, Leiden University Medical Center, Leiden, The Netherlands; 3. Department of Biomedical Data Sciences, Leiden University Medical Center, Leiden, The Netherlands; 4. Utrecht Institute for Pharmaceutical Sciences (UIPS), Division of Pharmacoepidemiology and Clinical Pharmacology, Utrecht University, Utrecht, The Netherlands; 5. Dutch Arthroplasty Register (LROI), 's-Hertogenbosch, The Netherlands; 6. Department of Anesthesiology, Leiden University Medical Center, Leiden, The Netherlands.

Background: Caution is suggested when prescribing benzodiazepines and opioids because of their potential adverse effects. However, evidence on their impact on outcomes after arthroplasty remains limited.
Aim: We examined whether postoperative benzodiazepine and opioid exposure, individually and concurrently, is associated with adverse outcomes after total hip or knee arthroplasty for osteoarthritis (THA-OA/TKA-OA) and hip arthroplasty for fracture (HA-fracture).
Materials and Methods: In this nationwide cohort study, the Dutch Arthroplasty Register, which provides patient and procedure information, was linked to the Dutch pharmaceutical register, which provides medication dispensing data.We included all patients who underwent primary THA-OA, TKA-OA, or HA-fracture between 2013 and 2022. Outcomes of interest were revision surgery for peri-prosthetic fracture and all-cause mortality within two postoperative years. Time-dependent Cox regression analyses were performed to model the periods of postoperative benzodiazepine, opioid, or concurrent (overlapping) use and outcomes.
Results: We included 92,474 THA-OA, 78,774 TKA-OA, and 16,590 HA-fracture patients. During follow-up, 521 THA-OA, 38 TKA-OA, and 57 HA-fracture patients underwent revision for periprosthetic fracture. No association was found between benzodiazepine or opioid use and revision risk. Over the same period, 1,508 THA-OA, 1,023 TKA-OA, and 3,019 HA-fracture patients died. Across all groups, both drug classes were associated with higher mortality risk. Among THA-OA patients, benzodiazepine use was associated with an adjusted hazard ratio (aHR) of 2.21 (95% CI, 1.82–2.68), and opioid use with an aHR of 4.97 (95% CI, 4.25–5.80). Concurrent use of both medications conferred an additional risk across all subgroups (interaction term aHR 2.50; 95% CI, 1.92–3.25). Similar estimates were observed for TKA-OA and HA-fracture patients.
Interpretation / Conclusion: Postoperative benzodiazepine and opioid use are independently associated with increased risks of all-cause mortality after THA-OA, TKA-OA and HA-fracture. Concurrent use conferred the highest mortality risk, supporting caution with combined prescribing after these procedures.

14. No association between prior knee multi-ligament injury and implant survival of subsequent total knee arthroplasty - A nationwide cohort study

Kajaanan Vijayakumar[1], Julius Tetens Hald[1], Anders Odgaard[1,2], Anders El-Galaly[1,2]
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Background: To assess 5- and 10-year implant survival and revision risk following total knee arthroplasty (TKA) in knees with prior multi-ligament knee injury (MLI), compared with TKAs performed for primary osteoarthritis without prior knee surgery.
Aim: (Included in the background)
Materials and Methods: This nationwide retrospective cohort study included all primary TKAs performed in Denmark between 1998 and 2021. Knees with prior MLI were identified using national health registers and matched in a 1:5 ratio by age, sex, Charlson Comorbidity Index (CCI), and date of primary procedure. Implant survival was estimated using Kaplan–Meier analysis, and Cox regression was used to calculate hazard ratios (HR) for revision.
Results: We identified 79 TKAs with prior MLI and 395 matched TKAs performed for primary osteoarthritis. At 5 years, implant survival was 91.2% CI (84.8 to 98.2) in the MLI group and 94.4% CI (92.1 to 96.8) in the primary osteoarthritis group. At 10 years, survival was 91.2% CI (84.8 to 98.2) and 94.0% CI (91.5 to 96.5), respectively. The difference was not statistically significant (log-rank test, p = 0.58). Implant constraint was not significantly associated with revision risk, HR 1.42 (CI 0.63 to 3.20). Time from MLI to TKA was not associated with revision risk, HR 1.09 (CI 0.94 to 1.27).
Interpretation / Conclusion: TKAs performed after prior MLI showed no statistically significant difference in 5- or 10-year implant survival compared with TKAs performed for primary osteoarthritis without prior knee surgery. Neither implant constraint nor time from injury to TKA was associated with increased revision risk.

15. Comparative Outcomes of Risk-Stratified Chemoprophylaxis Vs. Aggressive Chemoprophylaxis for Deep Venous Thrombosis Following Total Knee Replacement: A Randomised Controlled Trial

Tarun Goyal[1], Nitin Khunger[1], Lakshmana Das[1], Mosarraf Sarkar
1. Department of Orthopaedics, All India Institute of Medical Sciences, Bathinda

Background: Patients undergoing total knee arthroplasty (TKA) are at a higher risk for venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism. While low-molecular-weight heparin (LMWH) is a commonly used prophylactic agent, it carries the risk of bleeding. Risk-adapted strategy using aspirin for low-risk patients and LMWH for high-risk patients, may reduce adverse events without reducing efficacy.
Aim: To investigate if a risk-stratified thromboprophylaxis strategy can identify low risk patients who can be safely treated with aspirin alone, without LMWH after TKA.
Materials and Methods: This single-centre, open-label, randomised controlled trial enrolled 400 patients undergoing unilateral TKA for osteoarthritis. Patients were randomised to Group 1, receiving LMWH for 10 days followed by aspirin for a total of 6 weeks, or Group 2, receiving prophylaxis using a risk-stratified approach. Group 2 received aspirin alone if low risk, or LMWH followed by aspirin if high risk. Doppler ultrasonography of the bilateral lower limb veins was performed preoperatively and at 2 and 6 weeks postoperatively to detect both symptomatic and asymptomatic DVT. The primary outcome was the incidence of duplex-confirmed DVT. Secondary outcomes included bleeding complications, postoperative pain (VAS), and WOMAC & KOOS scores.
Results: 14 patients (3.5%) developed clinical symptoms suggestive of DVT. DVT was confirmed in only four patients on Doppler (1 patient in Group 1 and 3 patients in Group 2; RR 1.80; 95% CI 0.61–5.28; p = 0.28). Doppler surveillance also identified asymptomatic DVT in 10 patients (5.0%) in Group 1 and 12 patients (6.0%) in Group 2 at 2 weeks, increasing to 12 patients (6.0%) and 14 patients (7.0%), at 6 weeks . No pulmonary embolism or major bleeding was reported. Bleeding complications were higher in Group 1 (7.5%) versus Group 2 (2.5%) (RR 3.00; 95% CI 1.10–8.19; p = 0.032). Functional scores and pain scores showed comparable improvements.
Interpretation / Conclusion: A risk-adapted strategy using was safe and as effective as using LMWH for all patients. Rates of thromboembolic events were similar and bleeding-related complications were fewer. It may be a reasonable alternative to universal LMWH use.

SESSION 4: FREE PAPER SESSION – PEDIATRICS

Wednesday, 11 November 2026

09:00 – 09:45

Room: Ballon salen

Chairs:

Cecilie Arildsen
Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark

Andreas Balslev-Clausen
Department of Orthopedic Surgery, Rigshospitalet, Copenhagen University Hospital, Denmark

16. Angular alignment, rotational profile, and joint range of motion in the lower limb of typically developing children from 7–16 years of age

Christian Wong[1,2], Michael Mørk Petersen [2], Trine Henriksen [3], Ales Jurca [4], Søren Bødtker [2], Steen Harstaad [5]
1. Department of Orthopaedics, Odense University Hospital, Denmark; 2. Rigshospitalet, Copenhagen, Denmark; 3. Danish Foot Podiatrists, Denmark; 4. Volumental, Stockholm, Sweden 5. Center for Muscle and Joint Health, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, Denmark

Background: Normative reference values for lower limb alignment, rotational profile, and joint range of motion (ROM) in children are essential for distinguishing physiological variation from pathology, yet contemporary population-based data remain limited.
Aim: To establish updated reference intervals for lower limb angular alignment, rotational profile, and joint ROM in typically developing children, and to examine associations with age, sex, sidedness, and BMI.
Materials and Methods: Cross-sectional study of 501 typically developing children aged 6–17 years recruited from Danish primary schools. Standardized clinical assessments of hip, knee, and ankle ROM, rotational profile, and angular alignment were performed. Associations with age, sex, sidedness, and BMI were analyzed using descriptive statistics and regression models with correction for multiple testing.
Results: ROM of the hip, knee, and ankle decreased statistically with age, alongside reduced femoral anteversion and increased tibial torsion; however, these changes were small and not clinically meaningful. No consistent differences were observed between sexes or sides. In contrast, BMI was significantly associated with reduced ROM across multiple joints, with decreases of approximately 0.4°–1.2° per BMI unit. Overall, anthropometric parameters remained stable after the age of 7 years.
Interpretation / Conclusion: Lower limb alignment, rotational profile, and joint ROM are largely stable throughout childhood after age 7, with minimal clinical impact of age or sex. BMI appears to be a more relevant determinant of variation. These findings support the use of updated normative values and emphasize cautious interpretation of minor deviations in clinical practice.

17. Breech Presentation as a Risk Factor for Developmental Dysplasia of the Hip in a Large Norwegian Birth Cohort

Kaya Kvarme Jacobsen[1,2], Hege Kristiansen [3,4], Trude Gundersen [2,5], Atle Lie Stein [6,7], Karen Rosendahl [8,9], Lene Bjerke Laborie [2,10]

1. Deparment of Orthopedic Surgery, Førde Central Hospital, Norway 2. Department of Clinical Medicine, University of Bergen, Norway 3. Department of Pediatrics, Førde Central Hospital, Norway 4. Department of Clinical Science, University of Bergen, Norway 5. Department of Orthopedic Surgery, Haukeland University Hospital, Norway 6. Department of Clinical Dentistry, University of Bergen, Norway 7. The Norwegian Arthroplasty Registry, Haukeland University Hospital, Norway 8. Department of Radiology, University Hospital of North Norway, Norway 9. Department of Clinical Medicine, University of Tromsø, Norway 10. Department of Radiology, Haukeland University Hospital, Norway

Background: Developmental dysplasia of the hip (DDH) affects 2–3% of all newborns, increases the risk of hip osteoarthritis, and accounts for 30% of total hip replacements in adults under 40 years. Breech presentation is a well-established risk factor for DDH, but with possible subgroups at higher risk.

Aim: The objective of this study was to examine the association between breech presentation and DDH using data from a large Norwegian birth cohort.

Materials and Methods: We used data from the Norwegian Mother, Father and Child Cohort Study (MoBa), including approximately 115,000 children, 90,000 mothers, and 70,000 fathers. The diagnosis of DDH was based on parental questionnaires. Presentation at birth (breech or cephalic) was obtained from the Medical Birth Registry of Norway. We excluded children with cerebral palsy, congenital anomalies (except clubfoot), syndromes, chromosomal abnormalities, those in contact with habilitation services, and children not walking by 24 months. Only births after 210 days of gestation were included. Statistical analyses were performed using SPSS version 29.

Results: After applying exclusion criteria, 100,063 children remained in the dataset. Of these, 3,263 (3.3%) were diagnosed with DDH. Breech presentation occurred in 4.2% of pregnancies; 10.7% of these children developed DDH, compared to 2.9% among cephalic presentations. The odds for DDH increased with gestational age, with breech infants who developed DDH having on average five days longer gestation than breech infants without DDH. The proportion of boys with DDH was slightly higher in the breech group. Although birth weight was generally lower in breech deliveries, it was higher among breech infants who developed DDH. Among children with DDH, 53.7% in the breech group received treatment compared to 33.4% in the cephalic group.

Interpretation / Conclusion: Breech presentation is a significant risk factor for DDH. Findings from this large cohort support the “packaging” theory, suggesting that longer time spent in breech presentation increases the risk of DDH. Furthermore, children born in breech presentation appear more likely to have DDH requiring treatment. Our results indicate that further risk stratification of breech presenting children is needed.

18. Hip-Related Tenotomy and Progression to Severe Hip Displacement in Non-Ambulant Children with Cerebral Palsy: A Nationwide Cohort Study

Muhammed Bakhtiyar[1], Afrim Iljazi [1], Christian Wong [2], Andreas Balslev-Clausen [1], Michael Mørk Petersen [1]
1. Department of Orthopedic Surgery, Rigshospitalet, Copenhagen University Hospital, Denmark 2. Department of Orthopedic Surgery, Odense University Hospital, Odense, Denmark

Background: Hip displacement is a major complication in non-ambulant children with cerebral palsy. Hip-related soft-tissue release is commonly performed, but evidence on its effectiveness in preventing progression after established migration is limited.
Aim: To evaluate whether hip-related tenotomy is associated with reduced progression to severe hip displacement in non-ambulant children with cerebral palsy and established hip migration.
Materials and Methods: This nationwide register-based cohort study included children classified as Gross Motor Function Classification System (GMFCS) level IV or V enrolled in the Danish Cerebral Palsy Follow-Up Program (CPOP) between 2008 and 2023. Hips with baseline MP 30–49% were included and followed until first occurrence of severe hip outcome, defined as MP ≥50% or hip osteotomy. Death was treated as a competing event. Cumulative incidence was estimated using the Aalen–Johansen estimator. Associations were analyzed using Fine–Gray competing-risk regression with cluster-robust standard errors.
Results: A total of 259 children contributing 406 hips were included; 110 hips underwent hip-related tenotomy. At 10 years, cumulative incidence of severe hip outcome was 34.7% (95% CI 28.8–40.7) without tenotomy and 20.4% (95% CI 12.4–28.5) with tenotomy. In adjusted competing-risk regression, tenotomy was associated with reduced risk of severe hip outcome (subdistribution hazard ratio (sHR) 0.53, 95% CI 0.34–0.84; p = 0.006). Stratified analyses showed a significant association in GMFCS IV (sHR 0.35, 95% CI 0.16–0.78; p = 0.010), but not in GMFCS V (sHR 0.68, 95% CI 0.40–1.19; p = 0.180). Higher Modified Ashworth Scale (MAS) grades were independently associated with increased risk.
Interpretation / Conclusion: Hip-related tenotomy was associated with reduced progression to severe hip displacement among non-ambulant children with established migration, particularly in GMFCS IV. In GMFCS V, progression remained substantial despite soft-tissue release, underscoring the importance of careful patient selection and continued surveillance.

19. Screening for developmental dysplasia of the hip in the Netherlands from 2014 to 2024: shift in number of diagnoses and severity

H.W. van Kouswijk[1,2], F.E.C.M. Mulder[2], N.M.C. Mathijssen[3,4], A.J. Rasker[1,5], M. Witbreuk[5], M. Boot[6], J. van Linge[3,4], M.A. Witlox[2], TRAM consortium, P.B. de Witte[1]
1. Department of Orthopaedics, Leiden University Medical Center, Leiden, The Netherlands; 2. Department of Orthopaedics, Care and Public Health Research Institute (CAPHRI), University Maastricht, Maastricht, The Netherlands; \ 3. Department of Orthopaedics, Reinier de Graaf Hospital, Delft, The Netherlands; 4. Reinier Haga Orthopaedic Center, Zoetermeer, The Netherlands; 5. Joint Research, Department of Orthopaedics, OLVG Hospital, Amsterdam, The Netherlands; 6. Department of Orthopaedics, Spaarne Hospital, Hoofddorp, The Netherlands.

Background: During the inclusion phase of the national TRAM study (a multicentre randomized trial evaluating active monitoring versus abduction treatment for infants with centered developmental dysplasia of the hip; DDH), fewer infants were diagnosed with centered DDH within the Dutch selective screening programme than anticipated during trial initiation.
Aim: To assess temporal trends in DDH diagnoses over the past decade and their association with changes in screening conditions.
Materials and Methods: In this multicentre observational cohort, unique infants undergoing selective DDH ultrasound screening between July 1, 2014, and June 30, 2024, were included from five hospitals. DDH severity was assessed by certified operators using the Graf classification (no DDH [I]; centered [IIa-c]; decentered [D, III-IV]). Extracted variables included sex, gestational age, screening indication, year, and age at screening (weeks). Associations between screening characteristics and DDH severity were analysed using ordinal regression with hospital fixed effects, adjusted for demographics and risk factors.
Results: A total of 24,700 infants were screened, of whom 1,500 (6.1%) were diagnosed with DDH. Screening volume increased by 35% over the study period, accompanied by a gradual increase in age at screening (~3 days/year). The proportion of infants diagnosed with DDH declined from 10.3% in 2014 by 0.6% annually, with the relative proportion of centered DDH decreasing from 65% to 40%. In adjusted analyses, later screening year (β=0.04; 95%CI 0.01-0.07) and higher age at screening (β=-0.06; 95%CI -0.08--0.04) were significantly associated with lower DDH severity.
Interpretation / Conclusion: Over the past decade, increasing screening volume within a selective programme was accompanied by declining DDH diagnoses, particularly of centered forms. Higher age at screening was associated with reduced detection of centered DDH, consistent with its presumed self-limiting nature. These findings highlight the impact of evolving screening conditions and support timely screening in accordance with national guidelines.

20. Correlation between gestational age and alpha angles: A population-based study using natural language processing on ultrasound and radiology reports

Ane Møller Carlsen[1], Hans-Christen Husum[2], Mathias Hauge Bünger[1], Jan Duedal Rölfing[1], Martin Gottliebsen[1]
1. Department of Orthopaedics, Aarhus University Hospital, Denmark; 2. Department of Radiology, Regional Hospital Randers, Denmark

Background: Developmental dysplasia of the hip (DDH) is among the most common musculoskeletal conditions in infancy. The Pavlik harness is widely used and achieves normalization of clinical and ultrasound findings in most infants – however, radiological evidence of residual acetabular dysplasia (RAD) has been reported in a considerable proportion of children despite apparently successful early treatment. While often asymptomatic in early childhood, persistent dysplasia is associated with premature osteoarthritis, and may necessitate surgical correction. Advances in datamining and natural language processing (NLP) provide new ways to analyze both structured ultrasound parameters and unstructured clinical text, including narrative radiographic descriptions and maternal/child clinical documentation – providing opportunity to apply these models to large cohorts.
Aim: The study aims to evaluate the correlation between gestational age and alpha angles in children using an NL-model to extract data.
Materials and Methods: Population based study of all children born in the Central Denmark Region from January 1st 2012 to December 31st 2025 who received an index hip ultrasound within the first six months of life (n = 7922). Data was extracted from the electronic patient system (EPJ) from pediatric, orthopedic, and obstetric departments, and analyzed using an NLP model to extract alpha angles from ultrasound descriptions. A multiple linear regression model was used to predict alpha angles using gestational age, and adjusting for age at ultrasound.
Results: We identified 7922 children, of which 7637 had all relevant parameters (alpha angles, gestational age, age at ultrasound). When adjusting for age at ultrasound, alpha angles decrease by 0,48 degrees [95%CI -0.53 ; -0.44] for each additional week of gestational age ($p < 2.2e{-}16$).
Interpretation / Conclusion: The analysis shows a statistically significant correlation between gestational age and mean alpha angles ($p < 2.2e{-}16$) when adjusting for the age at ultrasound variable – alpha angles consistently decrease with higher gestational age.

SESSION 5: FREE PAPER SESSION – HIP ARTHROPLASTY

Wednesday, 11 November 2026

11:15 – 12:00

Room: Columbine

Chairs:

Stephan Maximilian Herbert Röhrl
Department of Orthopaedic Surgery, Oslo University Hospital, Norway

Mats Bue
Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus N, Denmark

21. Outcomes of different types of dual mobility cups in primary total hip arthroplasty: A nationwide observational study from the Norwegian Arthroplasty Register (2008–2024)

Mathias Uhlen Brevik[1], Sigurd Stenvik[2], Anne Marie Fenstad[2], Kirsti Sevaldsen[1,3], Jan-Erik Gjertsen[2,4], Otto Schnell Husby[1,3], Stephan M. Röhrl[5,6], Torbjørn Berge Kristensen[2], Geir Hallan[2,4,7], Ove Furnes[2,4], Frank-David Øhrn[1,3]

1. Department of Surgery, Nordmøre & Romsdal Hospital, Møre & Romsdal Hospital Trust, Norway; 2. The Norwegian Arthroplasty Register, Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Norway; 3. Faculty of Medicine and Health Sciences, Department of Neuromedicine and Movement Science (INB), NTNU Norwegian University of Science and Technology, Norway; 4. Department of Clinical Medicine, University of Bergen, Bergen, Norway; 5. Division of Orthopaedic Surgery, Oslo University Hospital Ullevål, Oslo, Norway; 6. Faculty of Medicine, University of Oslo, Oslo, Norway; 7. Department of Orthopedic Surgery, The Coastal Hospital at Hagevik, Haukeland University Hospital, Bergen, Norway.

Background: Dual-mobility (DM) cups were developed to reduce dislocation after total hip arthroplasty (THA). Their use in primary THA has increased, but comparative data on cup revision across different DM cup designs remain limited.

Aim: To compare survivorship free of cup revision in cemented non-modular DM (cDM), uncemented non-modular DM (ucDM), and modular dual-mobility (MDM) cups in primary THA. A secondary aim was to compare revision of any part of the THA.

Materials and Methods: We included 7,263 primary DM THAs reported to the Norwegian Arthroplasty Register from 2008 to 2024: 3,387 cDM, 1,540 ucDM, and 2,336 MDM. Cup revision was defined as exchange or removal of the acetabular component, with or without revision of the entire THA. Kaplan–Meier analyses estimated survivorship at 1, 5, and 10 years. Cox regression analyses were performed with cDM as reference, adjusting for age, sex, ASA class, diagnosis, and time period.

Results: MDM cups were more often used in younger osteoarthritis patients. For cup revision, 5- year survival was 96.2% (95% CI 95.5–96.9) for cDM, 96.9% (96.0–97.9) for ucDM, and 96.6% (95.8–97.4) for MDM. At 10 years, survival free of cup revision was 95.4% (94.3–96.5) for cDM and 95.8% (94.3–97.3) for ucDM; no estimate was available for MDM. In adjusted analyses, no statistically significant differences were found between the groups for cup revision. At 5 years, adjusted hazard rate ratios (HRR) for cup revision were 0.84 (95% CI 0.58–1.20) for ucDM and 1.05 (0.77–1.44) for MDM, compared with cDM. For revision of any part of the THA, 5-year survival was 94.4% (93.5–95.3) for cDM, 95.1% (93.9–96.4) for ucDM, and 94.8% (93.8–95.8) for MDM. At 10 years, the corresponding survival estimates were 93.2% (91.9–94.5) and 92.0% (89.7–94.4).

Interpretation / Conclusion: The three dual-mobility cup designs showed comparable survivorship in primary THA. No statistically significant differences were found in adjusted analyses for cup revision or revision of any part of the THA. Ten-year results were similar for cDM and ucDM, but unavailable for MDM.

22. Single versus Multiple Prophylactic Antibiotic Doses and Periprosthetic Joint Infection: A Target Trial Emulation Using Nationwide Danish Registry Data

Armita Armina Abedi[1,2], Marie Anneberg[3,4], Alma Becic Pedersen[3,4], Claus Varnum[5,6], Robin Christensen[7,8], Søren Overgaard[1,2]

1. Department of Orthopedic Surgery and Traumatology, Copenhagen University Hospital, Bispebjerg, Denmark. 2. Department of Clinical Medicine, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark. 3. Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark. 4. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark. 5. Department of Orthopedic Surgery, Lillebaelt Hospital - Vejle, Denmark. 6. Department of Regional Health Research, University of Southern Denmark, Denmark. 7. Section for Biostatistics and Evidence-Based Research, the Parker Institute, Bispebjerg and Frederiksberg Hospital, Copenhagen, Denmark. 8. Research Unit of Rheumatology, Department of Clinical Research, University of Southern Denmark, Odense University Hospital, Denmark.

Background: Periprosthetic joint infection (PJI) after total hip arthroplasty (THA) is serious. Optimal perioperative antibiotic dosing is unclear; shorter regimens may reduce exposure and resistance.
Aim: To emulate a randomized clinical trial comparing single-dose versus multiple-dose perioperative antibiotic prophylaxis for preventing PJI after primary THA for osteoarthritis.
Materials and Methods: This study was an emulation of a nationwide target trial using prospectively collected Danish registry data linked with microbiology databases. The cohort included all primary THA procedures performed between January 1, 2010, and December 31, 2020, with follow-up for up to one year. We estimated the causal effect of prophylactic regimen on PJI using stabilized inverse probability weighting based on propensity scores, followed by weighted logistic regression with hospital-clustered robust standard errors to obtain odds ratios (OR) and absolute risk differences (ARD). For the primary endpoint, noninferiority of single prophylactic antibiotic dosing would be demonstrated if the upper limit of the two-sided 95% confidence interval for the odds ratio was less than 1.40 compared with multiple dosing. Secondary outcomes included PJI within 365 days, any revision, hospital-treated infection, community-based antibiotic use, and mortality within 90 days. The study protocol was registered on medRxiv prior to conducting any analyses (DOI: 10.1101/2025.04.13.25325741).
Results: The cohort comprised 76,126 patients (6,409 single-dose; 69,717 multiple-dose), with good covariate balance after weighting. PJI within 90 days occurred in 63 patients (0.98%) in the single-dose group and 656 patients (0.94%) in the multiple-dose group. Weighted analyses yielded an OR of 0.97 (95% CI, 0.73–1.29) meeting the prespecified noninferiority criterion. Results were consistent for PJI within 365 days and across secondary outcomes.
Interpretation / Conclusion: In this nationwide target trial emulation, a single preoperative antibiotic dose was noninferior to multiple doses for preventing PJI after THA. These findings support minimizing perioperative antibiotic exposure without compromising infection prevention, although confirmation in randomized clinical trials is warranted.

23. The interaction effect between severe mental disorders and hip fracture on the risk of postoperative infection

Line Jakobsen Moestrup[1,2], Rikke Sommer Haaber[1,2], Simon Storgaard Jensen[1,2], Christina Vandenbroucke-Grauls[3], Alma Becic Pedersen[1,2]
1. Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark; 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark; 3. Department of Medical Microbiology and Infection Control, Amsterdam University Medical Centre, Amsterdam, Netherlands.

Background: Infections are the most frequent complication following hip fracture (HF) surgery. Approximately 30% of patients undergoing HF surgery have a diagnosed mental disorder (MD), but its potential interaction with HF surgery in relation to postoperative infection risk remains uncertain.
Aim: To examine the interaction effect between HF and MDs on the risk of postoperative infection.
Materials and Methods: The nationwide cohort study includes a cohort of HF patients aged ≥ 65 years operated during 2004-2021 and an age- and sex-matched comparison cohort from the Danish general population without HF. MDs were identified using International Classification of Diseases, 10th Edition codes F00-F48 from the Danish Hospital Registers. Outcomes were hospital-treated infections (H-TIs) and hospital- or community-treated infections (HC-TIs) within 30 days after surgery. Cumulative incidence functions (CIF) with 95% confidence intervals were estimated with death as competing risk. Interaction was assessed on absolute and relative scale using differences in incidence rates and hazard ratios.
Results: Across all MDs, CIFs were lower for H-TIs than for HC-TIs. Among 100,335 HF patients, the highest cumulative incidence of H-TIs was observed in those with mood disorders (18.1%, 17.3–19.0), whereas the highest incidence of HC-TIs occurred in patients with dementia (43.0%, 42.2–43.9). Among 498,943 matched comparators, anxiety disorders were associated with the highest cumulative incidence of H-TIs (2.1%, 1.8– 2.5), while dementia was associated with the highest incidence of HC-TIs (18.4%, 17.9– 18.8). Attributable fractions across MD categories ranged from 1.1%–32.3% for H-TIs and from 10.8%–19.7% for HC-TIs, indicating a synergistic effect between MDs and HF surgery on infection risk. The strongest synergistic effect was observed in patients with substance use disorders for both H-TIs and HC-TIs, with attributable fractions of 32.3% (20.4–44.2) and 19.7% (14.1–25.4), respectively.
Interpretation / Conclusion: HF patients with MDs are at higher risk of infection than comparators. MDs and HF surgery interact synergistically, which increases the infection risk more than 30%, highlighting the need for targeted treatment and care for HF patients with MDs.

24. Changes in pain catastrophizing, anxiety and depression and their association with physical function one year after total hip and knee arthroplasty

Douwe Rijntjes[1], E. Wassenaar[1], D.J. van den Berg[1], T.P.M. Vliet Vlieland[2], S.H.M. Verdegaal[3], A.J.H. Vochteloo[4], B.F.P. Broekman[5], R.G.H.H. Nelissen[1], M.G.J. Gademan[1,6]
1. Department of Orthopaedics, Leiden University Medical Center, Leiden, The Netherlands 2. Department of Orthopaedics, Rehabilitation and Physical Therapy, Leiden University Medical Center, Leiden, The Netherlands 3. Department of Orthopaedics, Alrijne ziekenhuis, Leiderdorp, The Netherlands 4. Department of Orthopaedics, Orthopedisch Centrum Oost Nederland, Hengelo, The Netherlands 5. Department of Psychiatry, Amsterdam University Medical Center, Amsterdam, the Netherlands. 6. Department of Clinical Epidemiology, Leiden University Medical Center, Leiden, The Netherlands

Background: Pain catastrophizing, depression and anxiety can affect postoperative recovery. However, little is known on how these psychological symptoms evolve after total hip- or knee arthroplasty (THA/TKA), and to what extent their change over time relates to postoperative physical function.
Aim: To investigate the evolvement of pain catastrophizing, depression and anxiety symptoms and their association with physical function one year after THA/TKA.
Materials and Methods: This concerns a multicentre longitudinal cohort study on patients scheduled for primary THA/TKA. Physical function, pain catastrophizing, anxiety and depression were assessed with the Hip disability/Knee injury and Osteoarthritis Outcome Score-Physical function Short form (HOOS-PS/KOOS-PS), the Pain Catastrophizing Scale (PCS) and the Hospital Anxiety and Depression Scale (HADS) at baseline, 3, 6 and 12 months postoperatively. To estimate the change psychological symptoms over time and their association with physical function at 12 months linear mixed models were used.
Results: 1621 THA and 1529 TKA patients were included. For THA patients, mean PCS scores decreased from 11.8 (95%CI 11.3-12.2) preoperatively to 6.0 (95%CI 5.5-6.5) one year postoperatively, in TKA patients scores decreased from 11.1 (95%CI 10.6-11.5) to 6.1 (95%CI 5.7-6.7). THA patients' mean HADS-anxiety and depression scores decreased from 3.9 (95%CI 3.7-4.0) to 2.9 (95%CI 2.7-3.1) and from 3.4 (95%CI 3.2- 3.5) to 2.0 (95%CI 1.8-2.2), respectively. For TKA patients, these scores decreased from 3.8 (95%CI 3.6-3.9) to 3.0 (95%CI 2.9-3.2) and from 2.8 (95%CI 2.7-2.9) to 2.1 (95%CI 2.0-2.3). The association between more psychological symptoms and poorer HOOS/KOOS at 12 months strengthened over time. In THA patients, beta coefficients for PCS increased from 0.31- 0.68, for HADS anxiety from 0.79-1.43, and for depression from 1.06-2.11. Similar results were observed in TKA patients.
Interpretation / Conclusion: Pain catastrophizing, anxiety and depression improved during the entire first year after THA and TKA, meanwhile their association with physical function at 12 months increased over time.

25. Inadequate PROMs commonly used in arthroplasty Registries carry high risks of type 2 errors when used in randomized and comparative studies.

Michael Rindom Krogsgaard[1,2,3], Mads Benjamin Krogh[1], Gustav Kalle Mølbak Vangsgaard[1], Christian Fugl Hansen[1]

Section for Sports Traumatology, Department of Orthopedic Surgery, Copenhagen University Hospital Bispebjerg and Frederiksberg, Denmark; Institute for Sports Medicine Copenhagen, Department of Orthopedic Surgery, Copenhagen University Hospital Bispebjerg and Frederiksberg, Denmark; Institute for Clinical Medicine, Copenhagen University, Denmark.

Background: Many National Arthroplasty Registries collect patient reported outcome measures (PROMs) to document the subjective outcome of surgery, and to compare various implants or techniques. But are these PROMs adequate instruments? And what is the consequence if they are not?

Aim: To identify PROMs used in arthroplasty registers, to assess their content and construct validity, and from literature to evaluate the effect of using inadequate PROMs.

Materials and Methods: Arthroplasty Registries were identified via search in PubMed and Google and information about the PROMs that were used was obtained from year reports and homepages. A 2021 thorough analysis of 61 musculoskeletal PROMs, including PROMs for hip and knee osteoarthritis, was updated, using a COSMIN search algorithm, and content and construct validity was assessed. Literature on consequences of using inadequate PROMs was searched in PubMed.

Results: 42 of 79 national arthroplasty registries use PROMs: EQ-5D-5L, KOOS, KOOS-12, Oxford Hip Score, Oxford Knee Score, Oxford Shoulder Score, WOOS, HOOS and Harris Hip Score. The updated catalogue presents an assessment of 275 validity studies for 17 knee and 12 hip PROMs, showing that none of the identified PROMs used in arthroplasty registers have adequate content and construct validity. Literature shows that in RCTs a significant difference between treatments is found more than twice as often in studies using a valid and adequate PROM compared to studies using inadequate PROMs. The risk of a ceiling effect is high with inadequate PROMs, lowering the chance of finding a difference between treatments. In studies when a clinically important difference between treatments had been demonstrated, suboptimal PROMs failed to show the difference.

Interpretation / Conclusion: The ability of the PROMs that are used in Arthroplasty Registries to detect differences between treatments, e.g., two types of implants or different treatment strategies, is reduced, and there is a high risk of type 2 errors. Therefore, in addition to hard endpoints, anchor questions should also be included, e.g., Numerical Rating Scale for pain and Numerical Rating scale for satisfaction. Only few registries use such outcomes.

SESSION 6: FREE PAPER SESSION – PEDIATRICS

Wednesday, 11 November 2026

11:15 – 12:00

Room: Harlekin

Chairs:

Christopher Iobst
Department of Orthopedic Surgery, Center for Limb Lengthening and Reconstruction, Nationwide Children's Hospital, Columbus, OH, United States

Jan Duedal Rölfing
Department of Orthopaedics, Aarhus University Hospital, Aarhus, Denmark

26. Should we remove flexible intramedullary nails after diaphyseal forearm pediatric fracture? A retrospective cohort study

Maria Tirta[1,2], Amalie Eikrem Holsæter[3], Eline Borg Holt[3], Richard Olsson[1], Rune Bruhn Jakobsen[1,3], Per-Henrik Randsborg[1,3]
1. Department of Orthopedic Surgery, Akershus University Hospital, Norway 2. Interdisciplinary Orthopaedics, Aalborg University Hospital, Denmark 3. Faculty of Medicine, University of Oslo, Norway

Background: Routine removal of elastic stable intramedullary nails (ESIN) after pediatric diaphyseal forearm fractures remains common practice despite limited supporting evidence.
Aim: To evaluate whether ESIN retention is associated with refracture risk compared with implant removal in pediatric forearm fractures, and to assess complications and healthcare resource use.
Materials and Methods: In this retrospective cohort study, 288 patients (<17 years) treated with ESIN for diaphyseal forearm fractures at a single center were included. Following a policy change in 2021, routine implant removal was discontinued, in favour of retaining implants unless symptomatic. Patients were grouped into removal (n=136) and non-removal (n=152). The primary outcome was refracture, analyzed using Cox regression. Early refractures (<12 months) were assessed using logistic regression. Secondary outcomes included complications and healthcare resource utilization, defined as the number of outpatient visits and radiographic examinations during follow-up.
Results: Among patients managed with planned retention, only 9 (6%) required later removal, all due to implant-related irritation. A total of 21 refractures (7.3%) occurred, of which 9.6% in removal and 5.3% in non-removal group (HR 1.4, 95% CI:0.5–3.4). Early refractures occurred in 5.9% and 3.3%, respectively (OR 1.8, 95% CI:0.6–6.2), including three cases within six months after implant removal. Complications occurred after implant removal (8.1%), with a higher infection rate than after the initial surgery. Patients in the removal group required more outpatient visits and radiographic examinations, with a higher proportion undergoing ≥3 visits (26.5% vs. 13.8%) and ≥6 radiographs (19.1% vs. 6.6%).
Interpretation / Conclusion: ESIN retention was well tolerated and not associated with an increased risk of refracture or other complications. In contrast, implant removal may introduce a period of increased vulnerability to refracture, in addition to added complications and greater healthcare use. These findings support adoption of a selective implant removal strategy, limiting removal to patients with implant-related symptoms.

27. Fall injuries among infants and toddlers in an urban Danish population

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1. Accident Analysis Group, Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark 2. Orthopaedic Research Unit, Department of Clinical Research, Faculty of Health Sciences, University of Southern Denmark.

Background: Due to young children's developing motor skills, limited coordination, and tendency to explore their environments without an understanding of danger, young children are particularly vulnerable to falls. Few studies have described the epidemiology of fall injuries in this group, specifically regarding lesions, the height of fall, and the objects they fall from.
Aim: This study describes the epidemiological characteristics of fall injuries in infants and toddlers, including injury mechanism and lesions sustained in an urban Scandinavian population.
Materials and Methods: We included all infants (0-1 years) and toddlers (2-3 years) treated at Odense University Hospital for injuries sustained in fall accidents 2017-2024. From the patient registration system, we extracted data regarding age, gender, fall heights, objects from which they fell, and diagnoses.
Results: The study includes 4497 (39%) infants and 6950 (61%) toddlers. In both infants and toddler, half of the fall injuries occurred from lower than 1 metre, 40% from the same level, and 10% from 1 metre or higher. Among those who fell from heights, 45% (CI: 44-46) of infants and 36% (CI: 35-37) of toddlers fell from furniture. Secondly, 19% (CI: 17-20) of infants fell from changing tables/lifts and 16% (CI: 15-17) of toddlers fell from play stands. The majority of both infants (77%, CI: 76-78) and toddlers (62%, CI: 61-63) had lesions in the head or neck. Toddlers had significantly more lesions in the upper limbs, lower limbs, and in the trunk than infants. Bruises and wounds were the most common type of lesion, 43% (CI: 42-44) and 37% CI: 36-38) in infants, and 30% (CI: 29-31) and 45% (CI: 44-46) in toddlers. The proportion of children with deep lesions was twice as high among infants (7.5%, CI: 6.7-8.3) than among toddlers (3.9%, CI: 3.5- 4.4). The proportion of fractures was higher in toddlers (15%, CI: 14-16) than in infants (9.2%, CI: 8.3-10.0).
Interpretation / Conclusion: The study showed differences between infants and toddlers regarding injury mechanism and lesion sustained from falls accidents. The results are valuable information when planning prevention campaigns of fall injuries in infants and toddlers in the community.

28. Cast Wedging For Redisplaced Pediatric Forearm Fractures: A High-Value Strategy That Reliably Restores Alignment And Avoids Surgery

Ali Yalcinkaya[1,2], Mubashir Wani[2,3], Jishar Sainulabdeen[3], Adil Ali[3], Mohammed Ebrahem[3], Imran Mumtaz[3], Ali Alabbas[3], Anirejuoritse Bafor[2], Christopher Iobst[2], Abdelsalam Hegazy[3], Farhan Ali[3]
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Background: Secondary displacement after closed reduction of pediatric forearm fractures occurs in 25–37% of cases. Cast wedging offers a noninvasive alternative to restore alignment without repeat anaesthesia or surgical fixation, yet it remains underused as operative fixation rates for redisplaced fractures continue to rise.
Aim: To evaluate the effectiveness of cast wedging in restoring radiographic alignment and avoiding further intervention in children with redisplaced forearm fractures, and to identify predictors of substantial radiographic correction.
Materials and Methods: Retrospective cohort study of 142 children aged 3–14 years who underwent cast wedging for redisplaced forearm fractures at a tertiary pediatric trauma centre (2021–2024). Radiographic deformity was measured pre-wedge, immediately post-wedge, and at final follow-up. Primary outcome was avoidance of additional intervention. Substantial correction was defined as ≥50% improvement in angulation. Multivariable logistic regression identified independent predictors of success.
Results: Cast wedging avoided repeat manipulation or surgery in 139/142 patients (97.9%). Median deformity improved from 17° pre-wedge to 10° post-wedge and 8° at final follow-up ($p<0.001$). Substantial correction (≥50%) was achieved in 53.2% of patients. Immediate post-wedge correction was the strongest predictor: 76.8% of those with ≥50% immediate correction ultimately achieved ≥50% final correction vs 30.0% with less immediate correction ($p<0.001$). Lower body weight independently predicted success (OR 0.64 per 10 kg; 95% CI 0.45–0.90; $p=0.011$). Younger children showed additional improvement between post-wedge and final follow-up. Complications were rare (2.1%). Model discrimination was strong (AUC 0.851).
Interpretation / Conclusion: Cast wedging is a safe, highly effective, and underused strategy for redisplaced pediatric forearm fractures, avoiding additional intervention in nearly all patients. Immediate post-wedge correction is the most clinically actionable predictor of final radiographic success, supporting careful optimisation at the time of wedging. These findings reinforce cast wedging as a high-value first-line option before repeat anaesthesia or surgical fixation.

29. Patient perspective on anaesthesia and treatment pathways following paediatric forearm fractures. A qualitative study.

Cecilie Mølgaard Arildsen [1,2], Stig Brorson[3,4,5], Nicola Groes Clausen[6], Tazio Maleitzke[4,7,8,9], Bjarke Viberg[1,2], Charlotte Myhre Jensen[1,2]

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Background: Paediatric forearm fractures requiring operative treatment are routinely managed under general anaesthesia in Denmark. While this approach provides effective analgesia and reduces procedural anxiety, it involves prolonged care pathways and rare but potentially concerning risks. Little is known about how children and their parents experience anaesthesia and the surrounding care process.

Aim: The aim of this study was to explore which aspects of care children and their parents perceived as important in their encounters with the healthcare system following paediatric forearm fracture treatment under general anaesthesia.

Materials and Methods: An exploratory qualitative study was conducted using semi-structured dyadic interviews with 11 children (aged 5–13 years) treated for forearm fractures and their parents. Interviews were conducted either in connection with cast or K-wire removal or within one month after completion of treatment, transcribed verbatim, and analysed using reflexive thematic analysis.

Results: Three overarching themes were identified: (1) Age, maturity, understanding and coping, showing that children's ability to manage procedures was not strictly age-dependent but shaped by individual maturity and situational coping; (2) The parental role between responsibility, control and emotional ambivalence, describing how parents navigated fear, rational risk assessment and the need to remain emotionally strong for their child; and (3) The importance of communication and framing of care, highlighting the role of clear information, predictable pathways and supportive staff interactions. Notably, anaesthesia functioned as both a regulatory strategy for children and a critical emotional transition for parents, who often described intense emotional release when temporarily relinquishing responsibility and when confronted with their child's apparent smallness and vulnerability in the operating theatre.

Interpretation / Conclusion: Children's and parents' experiences of paediatric fracture care are shaped less by age or procedure and more by individual coping, parental emotional management, the quality of communication and the framing and organisation of care.

30. KKR - Standardizing Care for Physeal Fractures: A Systematic Review and National Danish Follow-Up Strategy

Sebastian Strøm Rönnquist[1,2], Christian Færgemann[3], Morten Jon Andersen[2,4]
1. Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital – Rigshospitalet, Denmark; 2. Department of Clinical Medicine, University of Copenhagen, Denmark; 3. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark; 4. Department of Orthopaedic Surgery, Copenhagen University Hospital - Herlev and Gentofte, Denmark

Background: Narrative KKR – short clinical guideline regarding follow up of physeal fractures
Aim: To synthesize data on the incidence, risk factors, and timing of post-traumatic growth disturbance to propose an evidence-based follow-up pathway for Danish orthopedic departments.
Materials and Methods: A full systematic literature review was conducted.
Results: Overall growth disturbance rates reach 10-30%.
Interpretation / Conclusion: Growth disturbance is predictable based on injury severity and anatomic site. To standardize care, we suggest a Danish follow-up pathway featuring mandatory clinical and radiographic screening detection.

SESSION 7: FREE PAPER SESSION – EXPERIMENTAL

Wednesday, 11 November 2026

11:15 – 12:00

Room: Blomster salen

Chairs:

Anna Vasara
Musculoskeletal and Plastic Surgery, Helsinki University Hospital, Finland

Jasmin Bagge
Department of Orthopedic Surgery, Copenhagen University Hospital – Amager and Hvidovre, Hvidovre, Denmark

31. Cefepime/enmetazobactam steady-state concentrations in spondylodiscitis-relevant tissues – an experimental porcine study

Maria Bech Damsgaard Nielsen[1,2], Mads Kristian Duborg Mikkelsen[1,2], Kresten Wendell Rickers[2], Haisheng Li[2], Christoph Crocoll[3], Michal Poborsky[3], Nis Pedersen Jørgensen[2,4], Alex Soriano[5], Maiken Stilling[1,2], Mats Bue[1,2]
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Background: Spondylodiscitis is a severe infection associated with considerable morbidity and mortality. The prevalence of gram-negative infections is on the rise, posing significant therapeutic challenges. Cefepime/enmetazobactam constitutes a novel antibiotic combination that offers broad-spectrum activity against resistant gram-negative organisms. However, its pharmacokinetic profile within spinal tissues remains unknown.
Aim: To dynamically assess unbound steady-state concentrations of cefepime/enmetazobactam in vertebral cancellous bone, intervertebral disc, and paravertebral muscle after both short-term and continuous infusions.
Materials and Methods: 16 pigs were randomised to receive either short-term infusion (3 doses of 2g/0.5g cefepime/enmetazobactam administered over 2 hours, repeated every 8 hours) or continuous infusion (1g/0.25g loading dose administered over 15 minutes, followed by 6g/1,5g administered over 15 hours and 45 minutes). Steady state was assumed during the third dosing interval (16-24 hours). Microdialysis was employed to sample interstitial fluid from spondylodiscitis-relevant tissues: vertebral cancellous bone, intervertebral disc and paravertebral muscle, at steady state for 8 hours. The unbound concentrations of cefepime and enmetazobactam were quantified by LC– MS/MS. The primary endpoint was to determine the time above relevant MIC (T>MIC) for cefepime (0.125, 4, 8, and 32 mg/L) and the time above relevant concentration threshold (T>Ct) for enmetazobactam (2 and 8 mg/L)
Results: For both cefepime and enmetazobactam, there were no differences in T>MIC and T>Ct when comparing administration forms, applying the conventional targets of MIC 0.125, 4, and 8 mg/L, and Ct of 2 mg/L. Only when applying the aggressive targets of MIC 32 mg/L and Ct 8 mg/L did continuous infusion yield longer T>MIC and T>Ct compared with short-term infusion in both the vertebral cancellous bone and intervertebral disc.
Interpretation / Conclusion: Both cefepime and enmetazobactam consistently reached theoretically effective unbound steady-state tissue levels in relevant target tissues for spondylodiscitis, irrespective of the administration method.

32. Tendon attachment to porous 3D-printed titanium : Effects of strontium coating in a paired ovine model

Sarah S. Freund[1], Anna B. Borgognoni[1], Michael M. Bendtsen[1], Jørgen Baas[1], Jeppe S. Byskov[2], Bahram Ranjkesh[3], Steen Bærentzen[4], Jens R. Nyengaard[4,5], Thomas Baad-Hansen[1]
1. Department of Orthopaedics, Aarhus University Hospital, Denmark; 2. Additive Manufacturing, Danish Tecnological Institute, Denmark; 3. Section for Prosthetic Dentistry, Department of Dentistry and Oral Health, Aarhus University, Denmark; 4. Department of Pathology, Aarhus University Hospital, Denmark; 5. Core Center for Molecular Morphology, Section for Stereology and Microscopy, Department of Clinical Medicine, Aarhus University, Denmark

Background: Reliable tendon reattachment to prosthetic components remains a clinical challenge. Porous 3D-printed titanium implants show promising bone and soft-tissue ingrowth. Strontium surface modification may enhance biological response, but its effect on soft-tissue integration is not well established.
Aim: To compare Trevira® with non-coated and strontium-coated 3D-printed titanium implants by evaluating mechanical fixation and biological integration.
Materials and Methods: Two paired studies were conducted (n=10 per group), with each sheep receiving both Trevira® and titanium implants. Porous 3D-printed titanium implants (gyroid structure, 630 µm pores) were compared with Trevira® (approximately 200 µm pores). Strontium coating was applied by magnetron sputtering. Specimens were harvested after four weeks. Mechanical fixation was assessed by pull-out testing and normalized to attachment strength in kPa. Histomorphometry quantified fibroblast density, multinucleated giant cells, and microvessel density.
Results: Mechanical fixation was higher for titanium implants compared with Trevira® (Δ106 kPa, 95% CI 49–162; Δ75 kPa, 95% CI 21–128), with no difference between coated and non-coated implants. Fibroblast density was higher in Trevira® compared with both non-coated (Δ712 profiles/mm², 95% CI 79–1728) and coated titanium (Δ1147 profiles/mm², 95% CI 866–1428), and lower in coated compared with non-coated titanium (Δ316 profiles/mm², 95% CI 128– 505). Multinucleated giant cell density was higher in Trevira® compared with both non-coated (Δ5.2 profiles/mm², 95% CI 3.1–10.4) and coated titanium (Δ5.5 profiles/mm², 95% CI 0–7.7), and lower in coated compared with non-coated titanium (Δ0.9 profiles/mm², 95% CI 0–1.1). Microvessel density was higher in titanium implants compared with Trevira® (Δ4.7%, 95% CI 3.4–5.9; Δ3.5%, 95% CI 1.4–8.9), and higher in coated compared with non-coated titanium (Δ3.9%, 95% CI 1.3–6.4).
Interpretation / Conclusion: 3D-printed titanium provides superior tendon fixation compared with Trevira®. Strontium coating preserves mechanical strength while reducing inflammatory response and enhancing vascularization, indicating improved biological integration.

34. CD31⁺ Cell Enrichment Enhances Therapeutic Effects of Stromal Vascular Fraction in Experimental Primary Osteoarthritis

Sijia Zhou[1,2,3,4], Tobias Winkler[1,2,3], Bin Chen[1,2,3], Marta Grzeski[5], Yilong Yang[4], Florian N. Fleckenstein[6], Dominik Geisel[6], Alexander Hildebrandt[1,2,3], Daniela Aschenbrenner[1,2], Marie Agatha Mohn[1,2], Benjamin Claass[7], January Weiner 3rd[8], Sven Geissler[1,2], Georg N. Duda[1,2], Søren P. Sheikh[7], Oliver Klein[5], Tazio Maleitzke[1,3,9,10]

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Background: Despite the growing burden of osteoarthritis (OA), effective disease-modifying treatments remain limited. Stromal vascular fraction (SVF), a minimally processed and clinically accessible adipose-derived cell product, has shown therapeutic promise in OA; however, its biologically active subpopulations and underlying mechanisms remain insufficiently defined.
Aim: This study aimed to determine whether enrichment of the CD31⁺ cell fraction refines the therapeutic activity of SVF in osteoarthritis and to characterize the associated structural and molecular changes.
Materials and Methods: A comparative preclinical study was performed in the Dunkin Hartley guinea pig model of spontaneous primary OA. Animals received a single intra-articular injection of DPBS, unfractionated SVF, or CD31⁺-enriched SVF. Therapeutic effects were assessed using histology and OARSI scoring, immunohistochemistry and immunofluorescence, cartilage and infrapatellar fat pad transcriptomics, spatial proteomics by MALDI-MSI, µCT, MRI, and multiplex inflammatory profiling.
Results: Both SVF and CD31⁺ SVF attenuated OA-associated joint degeneration compared with DPBS. In cartilage, both treatments reduced catabolic and inflammatory changes, increased aggrecan expression, and suppressed MMP-13, TNF-α, and MCP-1. Spatial proteomics showed that both therapies modulated extracellular matrix composition, including reduced fibronectin and COL1A1 signals, with CD31⁺ SVF showing a more distinct ECM-remodeling profile. Compared with unfractionated SVF, CD31⁺ SVF also showed more pronounced and more consistent effects on osteochondral integrity, particularly in subchondral and trabecular bone microarchitecture. These findings indicate that CD31⁺ enrichment does not uniformly enhance all SVF effects, but rather refines its therapeutic profile in selected domains.
Interpretation / Conclusion: CD31⁺-enriched SVF and unfractionated SVF both exert therapeutic effects in spontaneous OA, but CD31⁺ enrichment is associated with selective advantages in ECM remodeling and osteochondral preservation. These findings support CD31⁺ enrichment as a biologically refined SVF-based strategy for further translational evaluation in OA.

35. Calca Gene-Derived Peptides Regulate Cartilage and Subchondral Bone in Murine Age-Related Osteoarthritis

Alexander Hildebrandt[1,2,3], Jérôme Weber[1,2], Tamara Dietrich[1,2], Mara Meyer Günderoth[1,2], Sijia Zhou[1,2], Ditte Jæhger[4], Tobias Winkler[1,2,5], Georg N. Duda[2], Serafeim Tsitsilonis[1,2], Anders Troelsen[6,7], Johannes Keller[8], Tazio Maleitzke[1,2,7,9]

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Background: Despite the increasing incidence of OA, approved disease-modifying treatments are not yet available. The Calca gene encodes three peptides (calcitonin gene-related peptide alpha (αCGRP), calcitonin (CT), and procalcitonin (PCT)) that act as central regulators of inflammation and bone turnover.
Aim: In this study, we investigate the role of Calca-gene-derived peptides in spontaneous, naturally occurring OA in mice.
Materials and Methods: Sixteen-month-old CT-receptor-deficient (Calcr-/-16m, n=11) and Calca-deficient (Calca-/-16m, n=12) mice with spontaneous OA were compared to age-matched wild type (WT16m, n=10) and healthy 4-month-old genotype-matched control mice (Calcr-/-4m, n=10; Calca- /-4m, n=10; WT4m, n=10). Intraarticular inflammation, articular cartilage and subchondral bone architecture were assessed by gene expression analysis, semi-quantitative OARSI scoring, histomorphometry, and µ-computed tomography.
Results: WT16m and Calcr-/-16m animals developed progressive OA with age while Calca-/-16m mice showed superior joint integrity. OA was characterized by cartilage degradation, marked chondrocyte cell death and subchondral plate sclerosis. Superior cartilage quality and greater chondrocyte viability in Calca-/-16m mice was accompanied by pronounced signs of osteopenia in proximal tibiae, counteracting subchondral bone sclerosis in these animals.
Interpretation / Conclusion: Inhibition of CT signaling has little impact on the development of spontaneous OA in mice, while the combined absence of αCGRP and PCT protect from cartilage degradation and subchondral bone sclerosis, and cause osteopenia in the proximal tibia.

137. Radiation exposure in pregnant orthopedic residents

Kine Andresen[1], Maren Gundersen[1], Maja Madlener[1], Margrethe Myhre[1], Helene Solberg[1], Camilla Jensen[1], Rune Jakobsen[1,2]
1. Akershus university hospital 2. University of Oslo

Background: The main principle in Norway is that pregnant employees should not work in situations where the fetus may be exposed to radiation. National regulations state that the radiation dose to a fetus must not exceed 1 mSv. At many hospitals, a clear precautionary approach is taken, and all pregnant physicians are routinely prohibited from work situations involving fluoroscopy, which in many cases leads to delays in training. We changed internal routines in collaboration with the radiation protection officer so that pregnant staff could continue to work with fluoroscopy.
Aim: To monitor work-related radiation exposure during pregnancy in orthopedic residents.
Materials and Methods: From April 1st 2024 to June 1st 2025, there were five pregnant residents in the department. All had a mandatory conversation with the radiation protection officer which included a review of the current knowledge, guidelines, and radiation hygiene principles. It was emphasised that continued work with radiation would only take place if the individual wished so. A full-wrap-around lead apron was to be used, as well as a personal dosimeter worn both over and under the apron. Personal dosimeters were changed every 60 days. An electronic dosimeter worn over the apron was also used for as many procedures as possible, and doses recorded on a per-case-basis.
Results: Of 21 readings from personal dosimeters worn over the lead apron, 10 were below the lower detection limit (<0.05 mSv). The mean value for the remaining readings was 0.19 mSv (SD 0.17). Similarly, only 4 of 22 dosimeters worn under the lead apron showed detectable values. Their mean value was 0.07 mSv (SD 0.02). There were 66 recorded radiation doses from individual procedures. The mean dose was 0.0094 mSv (SD 0.020). There was wide variation, from 0 to 0.135 mSv per procedure. The highest cumulative dose for a single resident was 0.231 mSv. This physician used an electronic dosimeter in approximately 50% of the procedures, corresponding to a fetal dose of 0.005 mSv.
Interpretation / Conclusion: Radiation doses were generally low. Even for the individual with the highest measured dose, the cumulative fetal dose was 1/216 of the dose limit specified in the Radiation Protection Regulations.

SESSION 8: FREE PAPER SESSION – SPORTS

Wednesday, 11 November 2026

13:00 – 13:45

Room: Columbine

Chairs:

Louise Eggers Rasmussen
Department of Orthopaedics , University Hospital of Southern Denmark, Esbjerg, Denmark

Jeroen van Egmond
Department of Orthopedic surgery, Bravis Ziekenhuis, the Netherlands

36. Periacetabular osteotomy followed by progressive resistance training compared to progressive resistance training as non-surgical treatment in patients with hip dysplasia (PreserveHip) – a randomised controlled trial

Lisa Tønning[1,2]
1. Department of Orthopaedics, Aarhus University Hospital, Denmark; 2. Department of Clinical Medicine, Aarhus University, Denmark

Background: Hip dysplasia is a common structural hip disorder that causes pain, impaired function and reduced quality of life in young adults. Although periacetabular osteotomy (PAO) is the preferred surgical treatment, evidence comparing PAO with non-surgical interventions remains limited.
Aim: To compare the efficacy of periacetabular osteotomy (PAO) followed by usual care and progressive resistance training (PRT) with 12 months of PRT alone on hip pain at 12 months in adults with hip dysplasia eligible for surgery.
Materials and Methods: Multicentre, randomised controlled trial with blinded outcome assessment. The PAO-group underwent surgery followed by four months of usual care and eight months of PRT. The PRT-group completed 12 months of PRT without surgery.
Results: Sixty-eight participants (mean age 29 years; 87% female) with radiographically confirmed hip dysplasia (centre-edge angle <25° and acetabular index >10°) and eligible for PAO were randomly assigned to PAO (35 participants) or PRT (33 participants). The adjusted between-group difference in the Copenhagen Hip and Groin Outcome Score (HAGOS) pain improvement at 12 months was 8.9 points (95% confidence interval (CI) -1.8 to 19.6) in favor of PAO, but without exceeding the minimal important change (MIC) of 9.7 points. Both groups improved at 12 months, showing mean changes of 22.8 points (95% CI 15.3 to 30.3) in the PAO-group and 13.8 points (95% CI 6.2 to 21.4) in the PRT-group.
Interpretation / Conclusion: Changes from baseline to 12-month follow-up in HAGOS pain did not conclusively support the hypothesis that PAO followed by usual care and eight months of PRT was superior to 12 months of PRT alone. The trial did not reach the planned sample size and larger, adequately powered trials are needed to determine the comparative efficacy of PAO followed by usual care and PRT versus PRT alone.

37. Donor site morbidity after MPFL reconstruction combined with trochleoplasty in patients with chronic patellofemoral instability - a non-randomized comparison of two prospectively followed cohorts, comparing gracilis- and quadriceps tendon autografts

Christian Dippmann[1,2], Isabel Kaeferstein [3,4], Peter Lavard [1], Kristoffer Barfod [1,2]
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Background: The objective of this study was to evaluate donor site morbidity and patient-reported outcome measures (PROMs) at 2-year follow-up in a cohort of patients treated for recurrent patellofemoral instability (PFI) with trochleoplasty (TP) and medial patellofemoral ligament reconstruction (MPFL-R) using either a gracilis tendon autograft (GTA) or a quadriceps tendon autograft (QTA). We hypothesize that utilizing a QTA was associated with less donor side morbidity and decreased risk of saphenous nerve damage compared with a GTA.
Aim: The aim of the study was to evaluate the difference in donor-site morbidity and clinical outcome in patients undergoing TP with either GTA or QTA for MPFL-R.
Materials and Methods: This prospective study included patients treated between November 2020 and January 2022. All patients underwent MPFL-R with TP following the Copenhagen PFI treatment algorithm. GTA was the standard graft until June 2021, thereafter QTA was the standard graft. Outcomes were donor site morbidity, including pain, cramps, loss of strength, and sensory disturbances, and the mean difference from baseline for the Knee Injury and Osteoarthritis Outcome Score (KOOS), the Lysholm, and the Kujala score one and two years postoperatively.
Results: Fifty consecutive patients, 32 in the GTA group (mean (SD) age 21.8 (5.9) years) and 18 in the QTA group (mean (SD) age 20.3 (6.2) years), were included. At the 2-year follow-up, pain at the donor site and loss of strength in the posterior thigh were more common in the GTA group (n=12) than in the QTA group (n=1) ($p<0.02$). Saphenous nerve injury was only reported in the GTA group (n=8, 25%, $p<0.04$). Mean improvements of KOOS, Kujala and Lysholm scores were comparable in both groups. At the final follow-up visit, no re-dislocations or major complications were reported with either graft type.
Interpretation / Conclusion: QTA was associated with less impairment of strength in the posterior thigh and less saphenous nerve injury compared to GTA two years after MPFL-R in combination with TP. No statistically significant differences in KOOS, Kujala and Lysholm scores were observed.

38. Dose-response relationship between training volume and improvements in physical function in patients with hip osteoarthritis

Troels Kjeldsen[1,2], Agnes Grünewald Larsen[1], Frederik Nicolai Foldager[1,2], Ulrik Dalgas[3], Søren Thorgaard Skou[4,5], Jan Moritz Grigat[1,2], Inger Mechlenburg[1,2,3]
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Background: Clinical guidelines recommend exercise as core treatment for hip osteoarthritis, but the importance of exercise dosage is greatly debated.
Aim: The aim of this study was to examine associations between training volume and changes in patient-reported and performance-based physical function.
Materials and Methods: This was an exploratory cohort study using longitudinal data from the Hip Booster trial, a multicenter randomized controlled trial conducted across 5 hospitals and 10 physiotherapy clinics in Denmark. Participants were randomized to 12 weeks of progressive resistance training (PRT) or neuromuscular exercise (NEMEX). This exploratory study included 144 participants with complete training and outcome data, including the Activities of Daily Living (ADL) subscale of the Disability and Osteoarthritis Outcome Score (HOOS) and the 30-second chair stand test (30s-CST).
Results: In the PRT group, a 64.700 kg increase in training volume (total kilograms lifted during intervention) was associated with a greater improvement in HOOS ADL corresponding to the minimal important difference (MID) of 8.6 points, while a 41.700 kg increase was associated with the MID for the 30s-CST of 0.5 repetitions. In the NEMEX group, an 8.958-repetition increase in training volume (total repetitions performed during intervention) was associated with a greater improvement in HOOS ADL, corresponding to the (MID) of 8.6 points, while a 3.225-repetition increase was associated with the MID for the 30s-CST of 0.5 repetitions.
Interpretation / Conclusion: In hip osteoarthritis, greater training volume was associated with greater improvements in patient-reported and performance-based physical function.

39. Effect of transition from paper-based forms to digital registration in the Norwegian Knee Ligament Register (NKLR); data on completeness and correctness

Rikard Ohlsson[1,2], Eivind Inderhaug[3,4,5], Håvard Visnes[5,6], Andreas Persson[5,7], Anne Marie Fenstad[5], Cathrine Aga[8,2]

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Background: The Norwegian Knee Ligament Register (NKLR) was founded in 2004 and has now registered more than 36,000 primary cruciate ligament reconstructions. Data was collected through paper-based forms until 2017, after which a digital solution using the Medical Registration System (MRS), was introduced. From January 2025, the data is collected through a full digital registration.

Aim: The main purpose of this study was to compare the completeness (degree of coverage) of reported primary ACL reconstructions (ACLR) in Norway before and after the introduction of MRS. The secondary aim was to evaluate correctness for selected key variables before and after the introduction of digital registration.

Materials and Methods: The study included all patients who underwent primary ACLR in 2015 (paper-based registration) and 2022 (digital registration) at three high volume Norwegian hospitals. The patient's medical records were reviewed and compared with reported data from NKLR. We assessed the degree of completeness of the registration, and the correctness of a selection of key variables such as cause of injury, demographic data, operation time, graft and fixation type, additional injuries, cartilage injury and meniscal injury/treatment. The patient's medical record was defined as the gold standard.

Results: In the periods 2015 and 2022, a total of 654 primary ACL reconstructions from the three hospitals were reported to NKLR. The completeness for reporting to the NKLR in 2015 and 2022 was respectively 89.6% and 90.9%. The positive predictive value (PPV) for selected key variables in the 2015 and 2022 cohorts ranged from 81.8–100% and 90.1–100%, respectively. Associated cartilage injury was the variable with the lowest proportion of correct registration in both cohorts. The PPV for cartilage injury in 2015 and 2022 was 81.8 and 90.1% respectively. The digital solution, with mandatory registration of key variables, led to 100% completeness of key variables.

Interpretation / Conclusion: Completeness and correctness for the Norwegian Knee Ligament Register was unchanged or better after the introduction of digital registration. The data quality in the register is still solid. It seems safe for other national registers to implement digital registration.

40. Meniscal Ramp Lesions on MRI Are Common but Poorly Correlate With Arthroscopy and Clinical Outcomes

Anders Stålman[1,2], Christoffer Von Essen[1,2], Riccardo Cristiani[1,2], Erik Lerjefors[1,3]
1. Stockholm Sports Trauma Research Center, MMK, Karolinska Institutet 2. Capio Artro Clinic, FIFA Medical Center of Excellence, Stockholm, Sweden 3, NU sjukvården, Sweden

Background: Meniscal ramp lesions are increasingly identified on MRI in patients with anterior cruciate ligament (ACL) injuries. However, discrepancies between MRI and arthroscopic findings raise concerns regarding their clinical relevance and prognostic value.
Aim: To evaluate (1) the prevalence and diagnostic agreement of meniscal ramp lesions on MRI versus at ACL reconstruction (ACLR), and (2) their association with patient-reported outcomes and subsequent meniscal surgery.
Materials and Methods: Two retrospective cohort studies including patients undergoing primary ACLR in 2018 (n=579). Preoperative MRI and surgical records were reviewed for meniscal ramp lesions. Study 1 assessed prevalence and associated factors. Study 2 evaluated prognostic outcomes, including KOOS4, minimal important change (MIC), patient acceptable symptom state (PASS), treatment failure, and additional medial meniscus surgery within 5 years.
Results: Ramp lesions were identified in 43.2% on MRI but only 9.8% at ACLR. MRI demonstrated high sensitivity (96.5%) but limited specificity (62.6%). Notably, no stable ramp lesions (Greif types 1–2) identified on MRI were confirmed at surgery. Posteromedial tibial bone bruising was associated with ramp lesions on both MRI and at ACLR. MRI-detected ramp lesions were not associated with differences in KOOS4, MIC, PASS, or treatment failure. In contrast, ramp lesions identified at ACLR were associated with lower KOOS4 (69.9 vs. 75.6) and lower PASS rates (20.0% vs. 55.8%, $p<0.05$). Additional medial meniscus surgery rates did not differ significantly, although numerically higher after ramp lesions identified at ACLR.
Interpretation / Conclusion: Meniscal ramp lesions are frequently detected on MRI but are less commonly confirmed at surgery, particularly for stable lesion subtypes. MRI findings alone have limited prognostic value, whereas ramp lesions identified at ACLR are associated with worse subjective outcomes. These findings suggest that ramp lesions represent a dynamic entity and highlight the importance of intraoperative confirmation in clinical decision-making.

SESSION 9: FREE PAPER SESSION – KNEE ARTHROPLASTY

Wednesday, 11 November 2026

13:00 – 13:45

Room: Harlekin

Chairs:

Per-Henrik Randsborg
Department of Orthopedic Surgery, Akershus University Hospital, Norway

Martin Lindberg-Larsen
Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark

41. Patellofemoral versus Total Knee Arthroplasty for Isolated Patellofemoral Osteoarthritis: 10-Year Results of a Randomised Trial

Anders Odgaard[1,2], Brice Ozenne[3], Søren Rytter[4], Per Wagner Kristensen[5], Snorre Stephensen[6], Amir Pasha Attarzadeh[7], Andreas Kappel[8], Paul Blanche[3]

1. Department of Orthopaedic Surgery, Rigshospitalet - Copenhagen University Hospital, Denmark 2. Department of Clinical Medicine, University of Copenhagen, Denmark 3. Section of Biostatistics, Department of Public Health, University of Copenhagen, Denmark 4. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus, Denmark 5. Department of Orthopaedic Surgery, Vejle Hospital, Vejle, Denmark 6. Department of Orthopaedic Surgery, Copenhagen University Hospital Gentofte, Copenhagen, Denmark 7. Department of Orthopaedic Surgery, Zealand University Hospital Køge, Køge, Denmark 8. Department of Orthopaedic Surgery, Aalborg University Hospital, Aalborg, Denmark

Background: National registries show that patellofemoral arthroplasty (PFA) has a lower survival rate than total knee arthroplasty (TKA), suggesting that PFA may be a less effective intervention for patellofemoral osteoarthritis (PFOA). However, short term RCT, case series, and clinical experience suggest that PFA offers superior outcomes.

Aim: To compare the long-term health benefits of PFA and TKA over a 10-year period.

Materials and Methods: Patients suffering from PFOA recalcitrant to non-surgical treatment were recruited for this trial and randomized (1:1) to PFA or TKA at seven Danish hospitals. The trial was double-blinded for the first year. Over the postoperative decade, the study tracked both knee-specific (OKS, KOOS) and generic (EQ-5D, SF-36) patient-reported outcomes (PROs), prioritizing time-averaged change in SF-36 Bodily Pain as primary outcome. Secondary outcomes were various other PRO metrics. Statistical evaluation utilized mixed models for repeated measures—adjusting for age and sex—while cumulative revision incidences were compared using competing risk analyses. (NCT01326156).

Results: From June 2007 to Sept 2014, 100 patients were randomized (mean age 64.4 years; 77% female). At the 10-year mark, data were available for 82 of 89 surviving participants. The mean time-averaged improvement in SF-36 Bodily Pain over 10 years was 37.2 for PFA compared to 30.3 for TKA (mean difference 6.9; 95% CI -0.9 to 14.7; p=0.081). PFA demonstrated greater mean time-averaged improvement for the majority of the decade; at 8 years mean difference 7.6 (95% CI 0.0 to 15.1; p=0.049). PFA showed a significantly higher mean time-averaged improvement in EQ-5D index over 10 years (0.174 vs. 0.119; MD 0.055; 95% CI 0.001 to 0.108; p=0.044), a QALY difference of 0.55. The 10-year cumulative incidence of revision was 12.0% for PFA and 6.0% for TKA (difference 6.0%; 95% CI -5.2% to 17.2%; p=0.29).

Interpretation / Conclusion: Both treatments are effective for PFOA. PFA offered greater cumulative gains in pain reduction and health-related quality of life for most of the decade, although the primary analysis was non-significant. The elevated revision rates observed for PFA in registries do not reflect the procedure's clinical utility or patient outcome.

42. Comparative functional outcomes of patellar resurfacing in patients undergoing posterior stabilized and cruciate retaining total knee arthroplasty: A randomized clinical trial

Tarun Goyal[1], Shashank Suman[1], Lokender Singh[1]
Department fo Orthopaedics, All India Institute of Medical Sciences, Bathinda

Background: Total knee arthroplasty (TKA) is an established treatment for end-stage osteoarthritis of the knee. Cruciate-Retaining (CR) and Posterior-Stabilised (PS) are the two commonly used TKA designs. It is unclear whether outcomes differ between cruciate-retaining (CR) and posterior-stabilised (PS) TKA designs. Limited literature exists comparing the functional results of patellar resurfacing between these two implant categories.
Aim: To compare the functional outcomes of patellar resurfacing between posterior-stabilised (PS) and cruciate-retaining (CR) implant designs
Materials and Methods: This was a randomised clinical trial including 122 patients aged 50–75 years undergoing primary TKA for primary osteoarthritis. Patients were randomly allocated into four groups: CR without patellar resurfacing, PS without patellar resurfacing, CR with patellar resurfacing, and PS with patellar resurfacing. Outcomes were assessed preoperatively, at 6 weeks, and at 6 months, including KOOS, WOMAC, VAS, SF-12 (PCS/MCS), Kujala score, FJS, Tegner-Lysholm score, Hip-Knee-Ankle (HKA) alignment, range of motion (ROM), and surgical duration.
Results: Baseline demographics were comparable between the groups. Patellar resurfacing significantly increased surgical duration (p-value <0.0001). KOOS scores were better in the resurfacing groups, especially in the PS with resurfacing group ($p < 0.05$). Kujala scores were significantly higher in the resurfacing groups at both follow-ups, with maximal improvement in the PS group. WOMAC and VAS scores improved similarly across all groups without significant intergroup differences. ROM at 6 weeks and 6 months was significantly higher in PS knees (mean 122°, SD at 6 months, $p < 0.001$). FJS and SF-12 MCS scores showed no differences, whereas SF-12 PCS showed a small but significant improvement in favour of the PS group with resurfacing.
Interpretation / Conclusion: Patellar resurfacing combined with PS knee design provides modest early benefits in ROM, patellofemoral function, and KOOS outcomes. However, by 6 months, overall functional recovery is similar across all the groups. All groups achieved substantial pain relief and patient satisfaction.

43. Three years after multicenter implementation of same-day discharge following primary hip and knee arthroplasty: Current status and progress

Oddrún Danielsen[1,2], Claus Varnum[1,3], Thomas Jakobsen[1,4], Mikkel Rathsach Andersen[1,5], Manuel Josef Bieder[1,6], Torben Bæk Hansen[1,7], Søren Overgaard[1,8,9], Henrik Kehlet[1,10], Christoffer Calov Jørgensen[1,11], Kirill Gromov[1,12], Martin Lindberg-Larsen[1,2]

1. Center for Fast-track Hip and Knee Replacement, Denmark 2. Dept. of Orthopaedic Surgery and traumatology, Odense University Hospital and Svendborg 3. Dept. of Orthopaedic Surgery, Lillebaelt Hospital – Vejle 4. Dept. of Orthopaedic Surgery, Aalborg University Hospital 5. Dept. of Orthopaedic Surgery, Copenhagen University Hospital, Herlev-Gentofte 6. Dept. of Orthopaedic surgery, Næstved, Slagelse and Ringsted Hospitals 7. Dept. of orthopaedic surgery, Regional Hospital Gødstrup 8. Dept. of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital, Bispebjerg 9. Department of Clinical Medicine, University of Copenhagen, Denmark 10. Section of Surgical Pathophysiology, Copenhagen University Hospital, Rigshospitalet 11. Dept. of Anaesthesia, Hospital of Northern Zeeland, Hillerød 12. Dept. of Orthopaedic Surgery, Hvidovre University Hospital

Background: In September 2022, a protocol for same-day discharge after primary hip and knee arthroplasty was implemented across eight public orthopedic centers covering all Danish regions. Same-day discharge was introduced as standard of care for carefully selected patients, with continuous evaluation based on real-time outcome and safety data.

Aim: The aim of this study was to assess temporal trends in same-day discharge over a 3-year period following implementation and to describe developments across centers.

Materials and Methods: This prospective consecutive cohort study included patients undergoing primary hip or knee arthroplasty at 8 public hospitals (Center for Fast-track Hip and Knee Replacement) from September 2022 to August 2025. Patients were screened using predefined inclusion and exclusion criteria and discharged on day of surgery when functional discharge criteria were fulfilled. Data from the same centers during a 6-month pre–COVID-19 period (July–December 2019) served as baseline comparison.

Results: Of 23,379 primary hip and knee arthroplasties registered in the entire study period, 44.3% (95% confidence interval [CI] 43.7-45.0) were eligible for same-day surgery (range 27.8-57.6% in centers), of whom 63.4% (range 24.9-72.3%) were discharged on day of surgery. Hence, 30.4% (CI 29.8-31.0) of all patients (eligible and non-eligible) were same-day patients with a range of 17.0-41.6% within centers. This represented a total increase from 6% in the baseline period. Over the 3-year period overall same-day discharge rates increased steadily, from 21.6% in the first 6-month period to 38.2% in the final 6-month period of the study period. Substantial inter-centre variation persisted with overall same-day discharge rates ranging from 18.7% to 69.5% in the final 6-month period and center improvements from baseline to final 6- month ranging from 5.7% to 46.2% across centres.

Interpretation / Conclusion: In a public healthcare setting, we found it possible to increase the same-day discharge after hip and knee replacement to 38.2% in the final six months of the study period. Despite a shared protocol, considerable inter-center variation persisted, highlighting the influence of real-world cultural, logistical and organizational factors.

44. Adherence to Stepped Care in Knee Osteoarthritis Prior to Orthopedic Consultation: A Multicenter Study

Walter van der Weegen[1], Michiel Siebelt[1], Anke Kornuijt[1,2], Anne Vochteloo[3], Keetie Cremers[4], Rintje Agricola[1,5]
1. Sports & Orthopedics Research Centre, St. Anna Hospital, Geldrop, the Netherlands; 2. Department of Physical Therapy, Anna Hospital, Geldrop, The Netherlands. 3. Centre for Orthopeadic Surgery OCON, Hengelo, The Netherlands 4. Department of Orthopedics, Canisius Wilhelmina Hospital, Nijmegen, The Netherlands 5. Department of Orthopaedics, Erasmus MC University Medical Centre, Rotterdam, Netherlands

Background: Guidelines recommend a stepped-care (SC) approach for knee osteoarthritis (OA), prioritizing conservative treatment before surgical referral. Real-world adherence to this pathway is uncertain, with possible undue strains on orthopedic practices.
Aim: To assess adherence to SC prior to orthopedic consultation and its association with treatment choice.
Materials and Methods: Multicenter observational study using prospectively collected Computer-Assisted History Taking data from three Dutch hospitals. Patients ≥55 years with knee complaints (n=7,874) were included. SC adherence was classified as full, partial, or none based on reported physiotherapy and analgesic use. In a subset (n=5,135), multivariable logistic regression evaluated associations between SC adherence and treatment (arthroplasty vs conservative), adjusting for clinical factors.
Results: Full SC adherence was reported by 12.0% of patients, 66.3% had partial adherence, and 21.7% reported no prior conservative treatment. Among patients with a recorded diagnosis (n=2,901), 96.1% had knee OA; 32.4% underwent arthroplasty. Full SC was associated with higher odds of arthroplasty versus no SC (OR 2.34, 95% CI 1.73–3.18), but showed poor discrimination (AUC 0.56). In multivariable analysis, predictors of arthroplasty included symptom duration (OR 3.85), age, BMI, pain severity, reduced walking ability, and full SC (OR 1.65). Model performance was acceptable (AUC 0.79) and unchanged without SC (AUC 0.78). Radiographic severity showed strongest discrimination (AUC 0.91).
Interpretation / Conclusion: Most patients referred for orthopedic consultation have not completed guideline-recommended stepped care. Although SC adherence is associated with arthroplasty, it adds minimal predictive value beyond clinical characteristics. These findings indicate suboptimal implementation of conservative OA management and inefficiencies in the care pathway.

45. Genicular Artery Embolization for the Treatment of Pain following Total Knee Arthroplasty

Florian Fleckenstein[1], Tazio Maleitzke[2,3], Tobias Winkler[3], Federico Collettini[1]
1. Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Department of Diagnostic and Interventional Radiology, Berlin, Germany. 2. Trauma Orthopaedic Research Copenhagen Hvidovre (TORCH), Department of Orthopaedic Surgery, Copenhagen University Hospital - Amager and Hvidovre, Hvidovre, Denmark. 3. Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Center for Musculoskeletal Surgery, Berlin, Germany.

Background: Persistent pain after total knee arthroplasty remains a clinical challenge. In a relevant subset of patients, no clear cause is identified despite extensive workup. Genicular artery embolization has emerged as a minimally invasive treatment option, but standardized patient selection criteria are lacking.
Aim: To evaluate the safety and clinical effectiveness of genicular artery embolization in patients with persistent pain after total knee arthroplasty within a structured rule out algorithm.
Materials and Methods: This single center retrospective analysis included consecutive patients undergoing genicular artery embolization for persistent pain after total knee arthroplasty between January 2023 and January 2026. All patients underwent a structured workup excluding infection, loosening, malalignment, malrotation, patellofemoral pathology, and metal hypersensitivity. Embolization was performed via antegrade femoral access using rapidly resorbable gelatin microspheres or imipenem cilastatin. Outcomes were assessed at baseline, 6 weeks, 3 months, 6 months, and 12 months using Numeric Rating Scale pain and KOOS subscores. Adverse events were classified according to the modified CIRSE classification system.
Results: Fifty eight patients underwent embolization. Technical success was achieved in all cases. Median fluoroscopy time was 13.5 min (IQR 10.3–16.6). Follow up was available in 100% at 6 weeks and 3 months, 69% at 6 months, and 33% at 12 months. Median pain score improved from 7 (IQR 6–8) at baseline to 5 (IQR 3.0–5.3) at 6 months and 4 (IQR 3.0– 5.5) at 12 months. Median KOOS Pain improved from 39 (IQR 33–50) to 65 (IQR 47–78) at 6 months. At 6 months, clinically meaningful improvement was achieved in 80% for pain score and in 62% to 82% across KOOS domains. No major or moderate adverse events occurred. Minor complications were limited to transient skin discoloration in 2 patients, both CIRSE grade 1 events.
Interpretation / Conclusion: Genicular artery embolization appears to be a safe and clinically effective treatment option for persistent pain after total knee arthroplasty when applied within a structured diagnostic algorithm.

SESSION 10: FREE PAPER SESSION – FOOT/ANKLE

Wednesday, 11 November 2026

13:00 – 13:45

Room: Blomster salen

Chairs:

Monica Sailer
Department of Orthopaedic Surgery, Akershus University Hospital, Norway

Marianne Toft
Department of Orthopaedic Surgery, Regional Hospital Viborg, Denmark

46. Effect of Ultrasound-Guided Corticosteroid Injection Combined With Exercise Therapy in Insertional Achilles Tendinopathy: A Randomized Placebo Controlled Trial

Julie P. Rydahl[1,2], Rene B. Svensson [1,2,5], Peter S. Magnusson [1,2,3], Michael Kjær [1,2], Finn E. Johannsen [1,2], Simon Døssing [1,2,4]

1. Institute of Sports Medicine Copenhagen, Department of Orthopaedic Surgery, University Hospital Bispebjerg-Frederiksberg, Copenhagen, Denmark. 2. Center for Healthy Aging, Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark. 3. Department of Physical and Occupational Therapy, University Hospital Bispebjerg-Frederiksberg Hospital, Copenhagen, Denmark. 4. Section for Sports Traumatology, Department of Orthopedic Surgery, University Hospital Bispebjerg-Frederiksberg Hospital, Copenhagen, Denmark. 5. Center for Fast Ultrasound Imaging, Department of Health Technology, Technical University of Denmark, Lyngby, Denmark

Background: Ultrasound-guided corticosteroid injection (CSI) is commonly used for insertional Achilles tendinopathy (IAT). It remains unclear if CSI adds value compared to placebo when combined with structured exercise therapy and load management.

Aim: To determine whether ultrasound-guided CSI is superior to placebo injection when combined with structured load management and progressive home exercises in patients with chronic IAT.

Materials and Methods: Fifty adults with chronic IAT were randomized to ultrasound-guided CSI (n = 26) or placebo injection (n = 24). Both groups were instructed in load management and a progressive app-guided exercise program. The primary outcomes were Victorian Institute of Sports Assessment-Achilles (VISA-A) total score and pain-subscore at 6 months. Secondary outcomes were global rating of change, ultrasound-assessed tendon thickness and Doppler activity, and self-reported recovery of pre-injury activity level, assessed at 1,2,3,6,9 and 12 months.

Results: At 6 months, no significant between-group difference existed in the VISA-A total score (placebo, 58.0; CSI, 46.4; mean difference, 11.6 [95% CI, −0.9 to 24.0]; p = .07) or VISA-A pain subscore (p = .053). The placebo group improved significantly from baseline to 6 months (mean change, +15.1; p < .001), whereas the CSI group did not (mean change, +2.7; p = .46). At 1 month, the CSI group reported higher global rating scores (mean, 2.2 vs. 0.8; mean difference, 1.3 [95% CI, 0.6 to 2.1]; p < .01) and showed lower Doppler activity at 1–3 months (all p < .05), but these effects were not sustained. At 12 months, recovery of pre-injury activity level was higher in the placebo group than in the CSI group (61.7% vs. 36.4%; mean difference, 25.3% [95% CI, −48.6 to −2.0]; p < .05).

Interpretation / Conclusion: In patients with chronic IAT, adding ultrasound-guided CSI to structured exercise therapy and load management did not improve 6- or 12-month outcomes compared to placebo injections.

47. A nationwide comparison of public and private treatment of Achilles tendon rupture in Finland

Marjukka Hallinen[1.], Oskari Leino[1.], Inari Laaksonen[1.], Markus Matilainen[2.], Elina Ekman[1.]
1. Department of Orthopaedics and Traumatology, Turku University Hospital, Turku, Finland 2. University of Turku, Turkui, Finland

Background: The incidence of Achilles tendon ruptures (ATRs) has increased globally. While operative treatment has traditionally been favored, recent evidence suggests that nonsurgical management with early functional rehabilitation provides comparable outcomes with fewer complications. In Finland, healthcare is delivered through both publicly funded and private sectors, yet potential differences in ATR treatment practices between these sectors remain unclear.
Aim: The purpose of this study was to compare the incidence of and treatment methods for Achilles tendon ruptures (ATRs) in public and private healthcare in Finland between 1997 and 2019.
Materials and Methods: This study utilized data from the National Hospital Discharge Register and the Finnish Register of Primary Health Care Visits, which comprehensively cover public and private healthcare in Finland. Patients with Achilles tendon ruptures were identified using ICD-10 code S86.0, and operative cases were defined by procedure code NHL10 performed within 30 days of injury. Duplicate records, pediatric patients, and cases with missing sector information were excluded, and data on patient characteristics, treatment type, and healthcare sector were analyzed.
Results: A total of 29,902 Achilles tendon ruptures were identified, with 56% treated nonoperatively and 44% operatively; 91% of cases were managed in the public sector and 9% in the private sector. The overall incidence increased over time, reaching 32.3 per 100,000 person-years in 2019, with nonoperative treatment becoming predominant in the public sector after 2009, while operative treatment remained dominant in the private sector ($P<0.001$). Patients treated privately were younger and more often male, and sports-related injuries were the most common cause, although external cause data were incomplete.
Interpretation / Conclusion: The distribution of public and private treatment for ATRs remained consistent during the follow-up period from 1997 to 2019. In the public sector, treatment methods became significantly more nonoperative during the study period, while no such change was observed in the private sector.

48. Suturing the Soleus and Gastrocnemius Subtendons Individually Reduced Soleus Subtendon Elongation 26 weeks after Ruptured Achilles Tendon Repair

Rasmus Mikkelsen[1], Lars Konradsen[1], Høffner Rikke[2,3], Michael Krogsgaard[1], Anne-Sofie Agergaard[3], Rene Svensson[2], Michael Kjær[3], Magnusson Stig Peter[2,3]
1. Department of Sport Traumatology, Copenhagen University Hospital Bispebjerg-Frederiksberg Hospital, Denmark 2. Department of Physical and Occupational Therapy, Copenhagen University Hospital Bispebjerg-Frederiksberg Hospital, Denmark 3. Institute of Sports Medicine Copenhagen, Copenhagen University Hospital Bispebjerg-Frederiksberg Hospital, Denmark

Background: Elongation of the Achilles tendon after rupture negatively impacts clinical outcome. Using a 3D-MRI technique we have recently shown that one week after standard surgical repair, the soleus and gastrocnemius subtendons elongated compared to the uninjured side
Aim: The present study examined if suturing the soleus and gastrocnemius subtendons individually could restore subtendon lengths 1- and 26-weeks post-surgery compared to a standard surgical technique.
Materials and Methods: Ambi-directional study design with a prospective part repairing the soleus and gastrocnemius subtendons separately (n=23) and a retrospective part with a standard single structure surgical repair (Kessler technique) (n=48). The individual subtendon suturing was inspired by the modified Lace technique (Segesser and Weisskopf; 2017). Pre-operative ultrasound imaging on the uninjured side was used to measure the distance from the superior corner of the calcaneus to the most distal muscle fiber of the soleus, which was then used as the target length during repair on the injured side. One and 26 weeks after surgery both groups underwent 3D MRI of both legs to determine the length of the two subtendons. Injured-uninjured difference was calculated to compare the two techniques. Statistics: Two-way ANOVA (surgery x time) with Sídák's post hoc multiple comparisons test was used to analyze the data for each subtendon separately.
Results: Soleus subtendon: there was a significant interaction ($P<0.05$), time ($P<0.001$), and surgery ($P<0.001$) effect. Individual suturing yielded a significantly smaller side-to-side difference at week 1 ($P<0.001$) and 26 ($P<0.05$) compared to standard surgery (mean, 95% CI). Gastrocnemius subtendon: there was no interaction or surgery effect, but a significant effect of time ($P<0.0001$, mean, 95% CI).
Interpretation / Conclusion: Individual repair the soleus and gastrocnemius subtendons restored the lengths 1-week post-surgery while standard surgical technique only restored gastrocnemius length. Individually repaired, both subtendons elongated over time but the soleus subtendon elongation at week 26 only to ~50% of the standard surgical technique. These data imply that both surgical technique and loading over time impact tendon elongation.

49. Achilles tendon rupture – 134 different operative procedures to choose from

Mikkel Graack[1], Michael Rindom Krogsgaard [1,2,3]
1. Institute of Sports Medicine Copenhagen, Department of Orthopedic Surgery, Bispebjerg and Frederiksberg Hospital Copenhagen University Hospital, Copenhagen, Denmark; 2. Section for Sports Traumatology, Department of Orthopaedic Surgery, Bispebjerg and Frederiksberg Copenhagen University Hospital, Copenhagen, Denmark; 3. Department of Clinical Medicine, Copenhagen University, Denmark

Background: How Achilles tendon ruptures are best treated is an ongoing debate. Weight-bearing, length and type of casting, principles for rehabilitation and other issues are commonly considered. Whether to operate or not seems like a simple research question. But which surgical procedure is the best?
Aim: The first step to identifying the best surgical method for a future RCT is to map the procedures described in literature, and this is the aim of the current study. **Materials and**
Materials and Methods: PubMed was searched for publications on surgical treatment of acute Achilles tendon rupture. Series as well as randomized/comparative studies were included. Studies on treatment of chronic tendon ruptures were excluded as well as reviews. All hits were assessed by two independent observers after headline, abstract and full article as necessary, and discrepancies were discussed. First, articles were categorized according to the overall surgical method, and for each of these 14 individual details on incision, preparation of tendon ends, suture-type and -technique, augmentation and closure were evaluated for further categorization.
Results: There were 3,080 hits. From headline and abstracts 2,398 articles were excluded, and from full-article read further 374 were excluded, leaving 308 included articles for analyses. Five principally different techniques were identified: open surgery, minimal invasive surgery, percutaneous surgery, endoscopic surgery and combined open / minimal invasive surgery. After characterization according to details, there were 134 different surgical methods. Only two of these were described independently by more than one research group.
Interpretation / Conclusion: There is no consensus on how to operate Achilles tendon rupture, and the vast majority of surgical groups are using their own method. It seems important to reduce the number of surgical options, based on analyses of the individual outcomes.

50. Differential Retraction between the proximally retracted Gastrocnemii and Soleus subtendons in Achilles Tendon Rupture - a discovery with potential impact on decision making and repair methods.

Susanne Olesen Schaarup[1], Eva Wetke[2], Finn Elkjaer Johannsen[3], Lars Konradsen[4]
1. Department of Orthopaedics, Naestved Hospital, Denmark 2. Department of Orthopaedics, Koege University Hospital, Denmark 3. Institute of Sports Medicine, Bispebjerg Hospital, Denmark 4. Department of Orthopaedics, Bispebjerg Hospital, Denmark

Background: Longitudinal detachment of the Gastrocnemius from the Soleus occurs in most Achilles tendon ruptures enabling independent proximal retraction of the individual subtendons. Differential retraction has not to our knowledge been quantified.
Aim: To present a method to measure and quantify retraction and differential retraction after Achilles Tendon Rupture (ATR).
Materials and Methods: 52 patients with acute ATR from an ongoing prospective cohort study were examined preoperatively Bilateral subtendon lengths of the Soleus (SOL) and both Gastrocnemius (MGS, LGS) tendons were measured with ultrasound a.m. Barfod: With the patient prone and both legs free hanging the most distal myotendinous junction locations of SOL, MGS and LGS were identified with ultrasound and marked on the skin bilaterally. Proximal retraction was measured by side-to-side height difference of the skin marks. Differential retraction was calculated as the difference between the soleus retraction and the longest Gastrocnemial retraction (either medial or lateral).
Results: Differential retraction between SOL and MGS/LGS subtendons was mean 0 mm and median 0 mm but with a very wide range (-38 - +47), N=52 Differential retraction of 10 mm or more was present in half of patients with ATR. 29% differed by 10-19 mm, 13% 20-29 mm and 8% 30-47 mm. SOL was the most retracted subtendon in 46 % and MGS+LGS in 44% of the cases. 10% were equally retracted. Mean SOL retraction (n=52) was 21 mm (0-50, SD 12.9), MGS (n=52) 20 mm (0-45, SD 11) and LGS (n=21) 18 mm (0-45, SD 11). The uninjured subtendons showed substantial variations in lengths: SOL mean 48 mm, SD 19, range 10-111 mm, MGS mean 177 mm, SD 20, range 126-236 mm, LGS mean 203 mm, SD 21, range 157-260 mm.
Interpretation / Conclusion: Retraction and Differential subtendon retractions are measurable using ultrasound a.m. Barfod. The normal Soleus subtendon showed a great variation in length from 10 to 111 mm. Differential retraction was present in 90% of the Achilles tendon ruptures but with a great variety in retraction patterns. 21% of patients had a differential retraction of 20 mm or more between the subtendons in the proximal stump.

SESSION 11: FREE PAPER SESSION – TUMOR

Wednesday, 11 November 2026

13:00 – 13:45

Room: Ballon salen

Chairs:

Trude Basso
Department of Orthopedic Surgery, St. Olavs University Hospital, Norway

Michael Mørk Petersen
The Musculoskeletal Tumor Section, The Department of Orthopedic Surgery, Rigshospitalet, University of Copenhagen, Denmark

52. Cross-cultural validation of PROMIS Cancer Physical Function and Pain Interference in Sarcoma Patients from Denmark and India

Kasper V. Rydberg[1], Prakash Nayak[2], Sarah S. Freund[1], Andrea Baad-Hansen[1], Thomas Baad-Hansen[1], Ajay Puri[2]
1. Aarhus University Hospital, Department of Orthopaedic Oncology, Aarhus, Denmark; 2. Tata Memorial Hospital, Department of Orthopaedic Oncology, Mumbai, India

Background: Patient-reported outcomes in musculoskeletal oncology are commonly assessed using legacy instruments such as the Musculoskeletal Tumor Society score (MSTS), Toronto Extremity Salvage Score (TESS), and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30). The Patient-Reported Outcomes Measurement Information System (PROMIS) may offer improved precision and scalability, but cross-cultural validation in sarcoma populations remains limited.
Aim: To evaluate the reliability and construct validity of PROMIS Cancer Pain Interference (PROMIS CPI) and PROMIS Cancer Physical Function (PROMIS CPF) following limb-sparing surgery for lower extremity musculoskeletal tumours in Danish and Indian cohorts.
Materials and Methods: Prospective cohorts of Danish (n=56) and Indian patients (n=150) were included. Internal consistency, test–retest reliability (2–4 weeks), measurement error, convergent validity, and floor/ceiling effects were analysed according to COSMIN methodology.
Results: Both PROMIS domains showed high internal consistency (Cronbach's α 0.98–0.99 for Danish; 0.97–0.99 for Indian patients). Test–retest reliability for PROMIS CPF was ICC=0.94 (Danish) and 0.76 (Indian), and for PROMIS CPI ICC=0.87 (Danish) and 0.51 (Indian). Association analyses showed that PROMIS CPF was associated with TESS (ρ=0.95 Danish; 0.70 Indian), EORTC QLQ-C30 function (ρ=0.92 Danish; 0.61 Indian), and MSTS (ρ=0.77 Danish; 0.36 Indian). PROMIS CPI was associated with EORTC QLQ-C30 pain (ρ=0.86 Danish; 0.54 Indian) and inversely associated with TESS (ρ=– 0.81 Danish; –0.52 Indian) and MSTS (ρ=–0.65 Danish; –0.22 Indian). No clinically relevant floor or ceiling effects were observed for PROMIS CPF. PROMIS CPI showed floor effects (38.9% Danish; 19.3% Indian). Legacy instruments showed floor effects for EORTC pain (23.6% Danish; 50% Indian) and ceiling effects in the Danish cohort for EORTC function (29.1%), TESS (29.1%), and MSTS (26.8%).
Interpretation / Conclusion: PROMIS Cancer Physical Function and Pain Interference instruments demonstrated acceptable measurement properties across cohorts, supporting their use for assessing patient-reported outcomes in culturally diverse sarcoma populations.

53. A Population-Based Retrospective Analysis on Treatment and Outcome in Children, Adolescents and Young Adults With Synovial Sarcoma in Denmark From 2002 to 2024

Maja Charlotte Dittmar[1], Ida Marie Ipsen Nielsen[1], Daniel Thor Halberg Dybdal[1,2], Mathilde Frost Køtter[1], Ninna Aggerholm-Pedersen[3,4], Christina Enciso Holm[5], Lisa Lyngsie Hjalgrim[1]
1. Department of Paediatric Oncology and Haematology, Rigshospitalet, Copenhagen, Denmark; 2. Childhood Cancer Research Group, Danish Cancer Institute, Danish Cancer Society, Copenhagen, Denmark; 3. Department of Clinical Medicine, Aarhus University, Denmark; 4. Department of Oncology, Aarhus University Hospital, Denmark; 5. Department of Orthopaedic Surgery, Rigshospitalet, Copenhagen, Denmark

Background: Synovial sarcoma (SyS) is a rare, high-grade mesenchymal malignancy primarily treated with surgery, with notable age-related differences in systemic therapy use. Incidence, survival and treatment patterns among young patients in Denmark have not previously been described.
Aim: To determine age-standardised incidence rates (ASIRs), assess overall survival (OS) and event-free survival (EFS) and describe treatment patterns among children, adolescents, and young adults with SyS from 2002 to 2024.
Materials and Methods: We conducted a retrospective nationwide cohort study of all patients aged <40 years diagnosed with SyS between 2002 and 2024 in Denmark (n=91). We calculated ASIRs and analysed 5-year OS and EFS across three age groups (0–14, 15–19, 20–39) for two diagnostic periods (2002–2012, 2013–2024). We also assessed OS and EFS by sex, largest tumour diameter, tumour localisation and disease status at diagnosis, using univariable analyses. Finally, we evaluated treatment patterns, with a focus on surgery and chemotherapy.
Results: The overall ASIR was 0.15 per 100,000. Five-year OS and EFS were 67% and 51%, respectively. Among patients with localised SyS, 5-year OS improved from 55% (95%CI: 42-71%) in 2002-2012 to 97% (95%CI: 91-100%; p<0.0001) in 2013-2024. EFS increased from 39% (95%CI: 27-56%) to 76% (95%CI: 63-91%, p=0.00026). Young adults consistently had poorer OS than paediatric patients. Tumour diameter >5cm and metastatic disease were significantly associated with poorer survival. Surgery was part of the primary treatment for all children and adolescents and 90% of young adults. Chemotherapy was used in 78% of children, 62% of adolescents and 34% of young adults. Surgical margins were distributed as 46% R0, 36% R1, 13% R2, and 5% missing data, without significant differences across age groups. The proportion of R2 resections decreased from 18% in 2002-2012 to 8% in 2013-2024.
Interpretation / Conclusion: In patients with localised SyS, survival improved from 2002 to 2024 across all age groups, yet young adults continued to have poorer outcomes than children and adolescents. Increasing age, tumour diameter >5cm and metastatic disease were associated with inferior survival. Use of chemotherapy varied notably by age group.

54. Survival disparities between children, adolescents, and young adults with high-grade bone cancer from 1990 to 2024: a population-based cohort study.

Daniel Dybdal[1,2], Klaus Rostgaard[2], Henrik Hjalgrim[2,3], Ninna Aggerholm-Pedersen[4,5], Niels Junker[6], Thomas Baad-Hansen[5,7], Pernille Edslev[8], Eva Kjær[1], Akmal Safwat[9], Michael Petersen[10], Lisa Hjalgrim[1]

1. Department of Paediatrics and Adolescent Medicine, Copenhagen University Hospital Rigshospitalet 2. Danish Cancer Institute, Danish Cancer Society 3. Department of Clinical Medicine, University of Copenhagen 4. Department of Oncology, Aarhus University Hospital 5. Department of Clinical Medicine, Aarhus University 6. Department of Oncology, Herlev and Gentofte Hospital 7. Department of Orthopaedic Oncology, Aarhus University Hospital 8. Department of Paediatrics and Adolescent Medicine, Aarhus University Hospital 9. Danish Center for Particle Therapy, Aarhus University Hospital 10. Department of Orthopaedic Surgery, Copenhagen University Hospital Rigshospitalet

Background: Bone sarcomas are important contributors to early-life cancer mortality and morbidity. Optimisation of treatment regimens has improved survival, but the survival disparity between children, adolescents, and young adults has widened. Population-based studies are needed to understand and address these disparities. This is the first comprehensive study of early-life bone sarcomas in Denmark.

Aim: To describe survival disparities among clinically relevant subgroups of CAYA diagnosed with osteosarcoma or Ewing sarcoma of bone in Denmark and identify potential contributing factors, including patient features, tumour characteristics and treatment regimen.

Materials and Methods: We combined population-wide data from national registers from 1990 to 2024 with clinical data from patient records. We calculated age-standardised incidence rates, 5-year relative survival rates stratified by several clinical factors, and Aalen-Johansen estimators for relapse/progression and death within 5 years.

Results: A total of 578 patients under 40 years of age were diagnosed with either osteosarcoma (n = 336) or Ewing sarcoma of bone (n = 242) in Denmark between 1990 and 2024. Five-year relative survival improved for patients aged 0–24 years but stagnated for those aged 25–39 years. We observed age-dependent differences in the distribution of tumours and in relative survival across anatomical sites, tumour sizes, and treatment regimens. Metastatic disease or a tumour diameter of > 8 cm reduced relative survival by 19 to 45 percentage points. A smaller proportion of 25– 39-year-olds underwent primary surgery, when compared to patients under 25 years of age.

Interpretation / Conclusion: Survival disparities between children, adolescents, and young adults with high-grade bone sarcomas have increased over time, and the causes are likely multifactorial. Age-dependent differences in the distribution of tumours across anatomical sites and in tumour size appear to play a role, likely linked to the key role of successful primary surgical management. The incidence of and survival from relapse/progression also appear to favour younger patients. Including patients in international, joint paediatric-adult treatment protocols remains a high priority.

55. Dovetail Osteotomies Enhance Rotational Stability and Reduce Plate Stress in Intercalary Femoral Allograft Reconstruction

Andreas M. Kristensen[1], Christian L. Nielsen [2], Saša Ćuković [3], Karupppasamy Subburaj [1], Thomas Baad-Hansen[2]
1. Department of Mechanical and Production Engineering, Aarhus University, Denmark; 2. Department of Orthopedic Surgery, Aarhus University Hospital, Denmark; 3. Institute of Biomechanics, Swiss Federal Institute of Technology (ETH Zurich), Switzerland.

Background: Non-union, graft fracture, and mechanical failure remain prevalent complications following biological reconstruction after bone sarcoma resection. Initial biomechanical stability is critical for successful osseointegration and complication prevention. The currently used transverse osteotomies provide no intrinsic mechanical interlock, leaving the construct heavily reliant on the fixation hardware.
Aim: This study aimed to evaluate whether dovetail osteotomies at the graft–host junction improve rotational stability, optimise load distribution, and reduce fixation hardware stresses compared with traditional transverse osteotomies in femoral intercalary reconstructions, assessed in both allograft-only and Capanna technique configurations.
Materials and Methods: A femoral diaphyseal model was analysed using the Finite Element Method (FEM) in five configurations: (0) intact femur, (1) allograft reconstruction with transverse osteotomies, (2) allograft reconstruction with dovetail osteotomies, (3) Capanna reconstruction with transverse osteotomies, and (4) Capanna reconstruction with dovetail osteotomies. Reconstructions included a lateral bridging plate with eight screws. Loading conditions comprised a 10 Nm torsion and a 2000 N axial compression. Outcomes included relative stiffness, peak principal stress in bone, and maximum plate von Mises stress.
Results: Dovetail osteotomies substantially increased relative rotational stiffness compared to transverse osteotomies in both allograft-only (Model 2: 90% vs. Model 1: 38%) and Capanna reconstructions (Model 4: 81% vs. Model 3: 53%) without compromising relative compressive stiffness. Under torsional loading, dovetail osteotomies both reduced peak stresses and produced a more uniform principal stress distribution in the allograft. Dovetail osteotomies also markedly reduced the maximum plate von Mises stress under torsion (Model 2: 29 vs. Model 1: 191 MPa, Model 4: 25 vs. Model 3: 63 MPa) and modestly under compression.
Interpretation / Conclusion: Dovetail osteotomies demonstrated superior rotational stability, improved stress distribution in bone, and reduced fixation plate stress compared with transverse osteotomies in both allograft-only and Capanna femoral intercalary reconstructions.

102. The first population-based comparison of key time intervals in high-grade bone sarcomas among children, adolescents, and young adults: Can delays explain the increasing age-related survival disparities?

Daniel Dybdal[1,2], Klaus Rostgaard[2], Ninna Aggerholm-Pedersen[3,4], Henrik Hasle[4,5], Mathilde Køtter[1], Maya Schambye[1], Henrik Hjalgrim[2,6], Bodil Engelmann[7], Thomas Baad-Hansen[4,8], Michael Petersen[6,9], Lisa Hjalgrim[1]
1. Department of Paediatrics and Adolescent Medicine, Copenhagen University Hospital Rigshospitalet, Copenhagen, Denmark. 2. Danish Cancer Institute, Danish Cancer Society, Copenhagen, Denmark. 3. Department of Oncology, Aarhus University Hospital, Aarhus, Denmark. 4. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark 5. Department of Paediatrics and Adolescent Medicine, Aarhus University Hospital, Aarhus, Denmark. 6. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark. 7. Department of Oncology, Herlev and Gentofte Hospital, Copenhagen, Denmark. 8. Department of Orthopaedic Oncology, Aarhus University Hospital, Aarhus, Denmark. 9. Department of Orthopaedic Surgery, Copenhagen University Hospital Rigshospitalet, Copenhagen, Denmark

Background: Survival disparities are increasing between children, adolescents, and young adults with high-grade bone cancers. The timing of diagnostic and treatment deliverables is known to influence survival rates, and systematic, age-dependent differences in these timings may contribute to survival disparities.
Aim: To conduct the first population-based study comparing the durations of key intervals throughout the diagnostic and treatment trajectories among children, adolescents, and young adults with high-grade bone sarcomas.
Materials and Methods: We included all patients aged 0 to 39 years with osteosarcoma (n = 186) or Ewing sarcoma of bone (n = 158) in Denmark from 2002 to 2024 (total n = 344). We combined national register data with clinical data from hospital records. We measured five key intervals within the diagnostic pathway and treatment course, including the timing of primary surgery in relation to neo-adjuvant and adjuvant treatment. These intervals were modelled using gamma distributions by age group, sex and primary tumour site.
Results: Young adults had 42.7 days (+90%) longer median duration from first health care contact to diagnosis, 8.2 days (+76%) longer median duration from diagnosis to initiation of treatment, and 6.2 days (+30%) longer median duration from primary surgery to re-initiation of chemotherapy compared to children and adolescents. Patients with pelvic tumours had 19.2 days (+36%) longer median duration from first health care contact to diagnosis than patients with lower extremity tumours.
Interpretation / Conclusion: Age-related differences in key time intervals could contribute to the well-documented survival disparity between children, adolescents and young adults with bone cancer. This includes the timing of primary surgery in relation to other treatment modalities. Future efforts to reduce delays and maintain treatment intensity should focus on identifying specific barriers in the patient trajectory.

SESSION 12: YODA/ACTA BEST PAPER

Wednesday, 11 November 2026

14:00 – 14:45

Room: Congress Hall

Chairs:

Christian Fugl Hansen
Department of Orthopaedic Surgery, Bispebjerg and Frederiksberg Copenhagen University Hospital, Denmark

Søren Overgaard
Department of Orthopaedic Surgery, Bispebjerg and Frederiksberg Copenhagen University Hospital, Denmark

182. Long-Term Stroke Risk Following Cervical Spine Injury: A Nationwide Registry-Based Case-Control Study

Lasse Kristensen[1,2], Ole Brink[2,3], Kristian Høy[2,4]
1. Aarhus University, Health, Denmark; 2. Department of Orthopaedics, Aarhus University Hospital, Denmark; 3. Danish Armed Forces 4. Department of Clinical Medicine, Aarhus University, Aarhus N, Denmark

Background: Cervical spine injury (CSI) may be associated with blunt cerebrovascular injury and acute stroke. However, the long-term risk of stroke following CSI remains unclear.
Aim: To determine whether CSI is associated with an increased long-term risk of stroke and stroke-related mortality compared with matched controls.
Materials and Methods: Between 2017–2023, 17,690 patients were treated at national trauma centres. Using Abbreviated Injury Scale codes, 822 patients with CSI were identified. A matched cohort of 7,850 controls treated for non-CSI conditions was selected from national databases. Stroke Incidence (ICD-10 I60–I64) and stroke-related mortality were recorded from hospital discharge to end of follow-up. Stroke-free survival was analysed using Kaplan–Meier methods, and Cox proportional hazards models were used to estimate adjusted hazard ratios (HRs) accounting for age and sex.
Results: Stroke occurred in 22 CSI patients (2.7%) and 80 controls (1.0%), corresponding to a risk ratio of 2.73 (95% CI 1.69–4.40; p<.001). mean time to stroke was shorter in the csi group (297 vs 578 days). stroke-related mortality higher among patients (1.0% 0.3%; rr 3.40; 95% ci 1.54–7.53; p="0.003)." adjusted analyses, independently associated with increased risk (hr 2.30; 1.33–4.01; age a significant predictor, whereas sex not.
Interpretation / Conclusion: This is among the first nationwide studies with long-term follow-up examining stroke risk after cervical spine injury. The cohort demonstrates that patients with CSI have a more than twofold increased risk of stroke and higher stroke-related mortality compared with matched controls, even in the absence of clinically diagnosed cerebrovascular injury. These findings likely reflect undetected or delayed vascular injury following CSI, predisposing patients to later cerebrovascular events. This highlights the potential need for long-term surveillance and preventive strategies in this population.

183. Tranexamic acid use and risk for infection after arthroplasty

Andrine Flom[1], Anne Marie Fenstad[3,4], Lars Nordsletten[1,2], Ove Furnes[3,5], Håvard Dale[3,5], Jan-Erik Gjertsen[4,5], Lene Solberg[1], Marianne Westberg[1,3]
1. Division of Orthopaedic Surgery, Oslo University Hospital, Oslo, Norway 2. Institute of Clinical Medicine, University of Oslo, Oslo, Norway 3. The Norwegian Arthroplasty Register, Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Norway 4. The Norwegian Hip Fracture Register, Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Norway 5. Department of Clinical Medicine, University of Bergen, Bergen, Norway

Background: Tranexamic acid (TXA) is an antifibrinolytic drug which reduces postoperative bleeding in patients undergoing surgery, including orthopaedic surgery such as total hip arthroplasty (THA), total knee arthroplasty (TKA), and hip hemi arthroplasty (HA). TXA utilization in orthopaedic surgery has increased over the last decade. Some studies implies that TXA also has an immunomodulating effect, possibly by reducing serum plasmin. The increased use of TXA is coincident with an observed decrease in periprosthetic joint infection (PJI).
Aim: To investigate if use of TXA is associated with a reduced risk of PJI after hip and knee arthroplasty.
Materials and Methods: THAs, TKAs, and HAs registered in the Norwegian Arthroplasty Register and the Norwegian Hip Fracture Register between 2011 and 2024, with follow-up to December 31st 2025 were included in the dataset. IBM SPSS statistics and R was used for Kaplan-Meier plots and Cox-regression. Endpoint was revision due to infection within one year.
Results: The total number of procedures included was 270,406 in 215,684 patients (128,408 THAs, 93,563 TKAs, and 48,435 HAs). Of these, 1.0%, 0.8%, and 2.1% respectively were treated for PJI during the first year. The proportion of revision for infection was 1.0% in the TXA group compared to 1.5% in the non-TXA group. Unadjusted, and using the non-TXA group as reference, the hazard ratio for revision due to infection was 0.668 (95% CI 0.618-0.722, P<0.001) overall, 0.932 (95% CI 0.809-1.073) for THAs, 0.871 (95% CI 0.711-1.067) for TKAs and 0.960 (95% CI 0.850-1.084) for HAs. Through the period, total TXA use increased from 26.7% in 2011, to 91.7% in 2024.
Interpretation / Conclusion: In this register study we observed that the use of TXA in hip and knee arthroplasty was associated with a 0.5% reduction of revision due to PJI.

184. What is the optimal route of tranexamic acid administration during total hip arthroplasty? A randomized controlled trial

Paulius Zasčiurinskas[1,2], Gintarė Lukoševičiūtė[1,2], Šarūnas Tarasevičius[2]
1. Lithuanian University of Health Sciences, Faculty of Medicine, Kaunas, Lithuania 2. Lithuanian University of Health Sciences, Department of Orthopedics and Traumatology, Kaunas, Lithuania

Background: Tranexamic acid (TXA) is widely used to reduce blood loss in orthopedic surgery. There is an ongoing debate on which administration algorithm is most effective — intravenous (IV), intra-articular (IA), periarticular injection (PAI) or a combination of these. Our systematic literature search identified an evidence gap in Total Hip Arthroplasty (THA), as no papers have been published researching the efficacy of the mentioned administration routes.
Aim: To investigate the difference in blood loss parameters when comparing different TXA administration routes in THA.
Materials and Methods: Patients were randomly allocated to one of four groups. Group 1 (G1) received an IA of TXA and a PAI placebo. Group 2 (G2) received an IA placebo and PAI TXA. Group 3 (G3) received both IA and PAI TXA. Group 4 (G4) received IA and PAI placebo. All groups received IV TXA, ensuring an equal composite dose. All groups received the same (peri)operative care, by the same team. With the exception of Group 4, all patients received 1000 mg of intravenous TXA 30 minutes before surgery and a further 1000 mg of intravenous TXA 30 minutes after surgery. Patients in Group 4 received 1500 mg of intravenous TXA both before and after surgery.
Results: A total of 100 patients were included in the study. In G1 (IA + IV TXA + PAI placebo), mean patient age was 59.0; observed TBL was 1104.5 mL, HBL was 837.4 mL, calculated %TBL was 21.5% of PBV, and %HBL was 16.3%. In G2 (PAI + IV TXA + IA placebo), mean age was 62.4; observed TBL was 1095.0 mL, HBL was 819.7 mL, calculated %TBL was 22.8 % of PBV, and %HBL was 17.0 %. In G3 (PAI + IV + IA TXA), mean age was 65.1; observed TBL was 1138.9 mL, HBL was 936.7 mL, calculated %TBL was 24.6 % of PBV, and %HBL was 20.2 %. In G4 (IV TXA + IA placebo + PAI placebo), mean age was 60.1; observed TBL was 1066.0 mL, HBL was 800.4 mL, calculated %TBL was 22.0 % of PBV, and %HBL was 16.4 %. No statistically significant differences in any of the blood-loss parameters were observed between the groups.
Interpretation / Conclusion: This RCT demonstrated that there is no statistically significant difference between the different TXA administration routes during THA, when the total composite dose of TXA is kept equal across the routes.

185. Trends in revision rates for dislocation after total hip arthroplasty: a landmark analysis to compare the direct anterior with the posterolateral approach using data from the Dutch Arthroplasty Register (LROI).

Caspar Hulleman[1], Brechtje Hesseling [1], Jansje Pasma [1], Liza van Steenbergen [2], Marta Fiocco [3,4,5], Marijn Rutgers [1]

1. Reinier Haga Orthopedic Center, Zoetermeer, The Netherlands 2. Dutch Arthroplasty Register (LROI), 's-Hertogenbosch, The Netherlands 3. Mathematical Institute, Leiden University, Leiden, The Netherlands 4. Princes Máxima Centrum for Pediatric Oncology, Utrecht, The Netherlands 5. Department of Biomedical Data Science, Leiden, The Netherlands

Background: There is a subgroup of patients who experience a dislocation of a total hip arthroplasty (THA) after a prolonged period of well-functioning prosthesis. It is already established that using the direct anterior approach (DAA) reduces this risk within the first five years after surgery compared to the posterolateral approach (PLA).

Aim: This study aims to investigate the hazard for revision for dislocation following primary THA with PLA compared to primary THA with DAA in three distinct time frames after surgery.

Materials and Methods: Data on 221,131 primary THAs placed for osteoartritis and performed between 2013 and 2022 were collected from the Dutch Arthroplasty Register (LROI). A competing risk model was used to estimate the effect of approach (PLA, DAA) on revision for dislocation, with revision for other reasons and death as competing events. A landmark analysis was performed at three different landmark points, for the following time windows: 0 – 1 year after surgery; 1-5 years, and from 5 years onward, to estimate the cause-specific hazard ratio adjusted for age and BMI (HRacs), for revision due to dislocation. All patients alive and event-free at each landmark point were included in the analysis and were censored at the end of each time window if they were still alive without experiencing any event. HRacs with 95% confidence interval (CI) are reported for each time window.

Results: Data on 129,214 and 80,032 THA procedures were available for the PLA and DAA groups, respectively. Between 0 and 1 years, the HRacs (95% CI) was 3.07 (2.57 – 3.66) for PLA . For 1 – 5 years (203,843 patients were included in the analysis) HRacs was 6.62 (4.91 – 8.92), and 4.85 (2.63 – 8.95) at the landmark point 5 years (97,010 patients were included in the analysis).

Interpretation / Conclusion: Our results suggest that THAs performed with the PLA have a higher cause-specific hazard of revision for dislocation in all time frames, even beyond 5 years postoperatively.

186. Local application of CarboCell G/C eradicates Staphylococcus aureus in an experimental orthopaedic prophylactic setting

Mads K.D. Mikkelsen[1,2], Catrine J. Bertelsen[3], Maiken Stilling[1,2,4], Maria Bech Damsgaard Nielsen[1,2], Josephine O. Kipp[2,4], Christoph Crocoll[5], Michal Poborsky[5], Jonas R. Henriksen[3], Anders E. Hansen[3], Mats Bue[1,2,4]
1. Aarhus Denmark Microdialysis Research (ADMIRE), Aarhus University Hospital, Denmark; 2. Department of Clinical Medicine, Aarhus University, Denmark; 3. Department of Health Technology, Technical University of Denmark, Denmark; 4. Department of Orthopaedic Surgery, Aarhus University Hospital, Denmark; 5. Department of Plant and Environmental Sciences, University of Copenhagen, Denmark.

Background: To reduce postoperative infection risk in orthopaedic surgery, antibiotic prophylaxis is recommended for procedures involving implants or foreign bodies. Local antibiotic therapies are not routinely used for antibiotic prophylaxis, but in certain patient populations good efficacy has been shown.
Aim: The present study aimed to 1) evaluate whether CarboCell G/C can reduce total antibiotic exposure compared to systemic administration of gentamicin and clindamycin while maintaining local therapeutic efficacy, and 2) to quantify tissue concentrations of gentamicin and clindamycin after systemic delivery.
Materials and Methods: Ten pigs were inoculated with Staphylococcus aureus and had a K-wire implanted in the metaphysis of both hind legs (n=20) and randomised into 3 treatment groups for a 24-h study period: Group A, local treatment (1.0 mL) with CarboCell G/C (4 pigs, n=8), Group B, intravenous gentamicin 300 mg and clindamycin 600 mg every 8 h (4 pigs, n=8), and Group C, no treatment (2 pigs, n=4). Soft tissue, bone and the K-wire were collected for microbiological testing. In Group B, microdialysis was utilised to evaluate gentamicin and clindamycin concentrations in bone and subcutaneous tissue and make a descriptive comparison to recently reported bone concentrations following CarboCell G/C injection.
Results: In Group A, no S. aureus growth was identified on any samples. In Group B, one K-wire yielded S. aureus growth. In Group C, S. aureus growth was identified in all but one tissue sample. Compared to locally administered CarboCell G/C, systemically administered gentamicin and clindamycin exhibited peak drug concentrations in bone tissues that were 44 and 140 times lower, respectively.
Interpretation / Conclusion: CarboCell G/C provides comparable prophylactic efficacy to systemic administered gentamicin and clindamycin in an experimental surgical orthopaedic setting. Further, CarboCell G/C enables markedly higher bone concentrations of gentamicin and clindamycin.

SESSION 13: FREE PAPER SESSION – HIP ARTHROPLASTY

Wednesday, 11 November 2026

14:00 – 14:45

Room: Columbine

Chairs:

Lars Lykke Hermansen
Department of Orthopedics, University Hospital of Southern Denmark, Denmark

Kaspar Tootsi
Orthopaedic Clinic, Tartu University Hospital, Tartu, Estonia

56. Uncemented Collum Femoris Preserving versus cemented Lubinus SP II stem in total hip arthroplasty in patients 70 years and older: a randomized controlled trial with 5-year follow-up

Diederik R. de Boer[1], Roelina Munnik-Hagewoud[1], Yasmin van Benthem[1], Mats J. van Rietschoten[1], Pieter B.A.A. van Driel[1], Cees C.P.M. Verheyen[1], Harmen B. Ettema[1]
1. Department of Orthopaedics, Isala Hospital, Zwolle, The Netherlands

Background: In older patients undergoing primary total hip arthroplasty (THA), cemented stems are associated with aseptic loosening, whereas uncemented stems are associated with periprosthetic fractures. Bone-preserving uncemented short stems, such as the Collum Femoris Preserving (CFP) stem, may reduce revision risk and offer advantages regarding offset restoration and bone preservation.
Aim: To compare 5-year clinical and radiological outcomes of the uncemented CFP and cemented SP II stems in older patients.
Materials and Methods: Patients aged 70 years and older undergoing primary THA for symptomatic osteoarthrosis were randomized to receive either a CFP or 130-mm SP II stem. The primary outcome was the Hip disability and Osteoarthritis Outcome Score (HOOS) during the first postoperative year. Secondary outcomes included patient-reported outcome measures (PROMs) up to 5 years, complications, revisions, implant survival, perioperative data, radiological outcomes, and periprosthetic bone mineral density (BMD).
Results: 149 patients were randomized to CFP (n=66) or SP II (n=83). The between-group difference in HOOS during the first postoperative year was -1.6 points (95% CI: -6.6 to 3.4), meeting the pre-defined noninferiority criterion. No significant differences were found in other PROMs up to 5 years. 5-year stem survival was 95.4% and 97.5% for the CFP and SP II stems, respectively ($p = 0.301$). Operative time was 10 minutes shorter in the CFP group ($p<0.001$). Femoral offset increased more in the CFP group ($p<0.001$), whereas BMD did not differ significantly. Radiolucent lines around the tip were more observed in the CFP group ($p<0.001$).
Interpretation / Conclusion: In patients 70 years and older, the uncemented CFP stem provided no clinical or radiological advantages over the cemented Lubinus SP II short-stem at 5- years follow-up.

57. Early dislocation is associated with worse patient-reported improvements 12 months after total hip arthroplasty: A multicenter registry-based cohort study of 5,102 procedures

Claus Varnum[1,2], Marc Alexander Nomberg[2], Thomas Jakobsen[3], Kirill Gromov[4], Anders Troelsen[4], Christian Bredgaard Jensen[4], Simon Kornvig[1,2]
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Background: Dislocation is one of the most frequent complications after total hip arthroplasty (THA). The most common treatment of a first-time dislocation is closed reduction. However, no studies have investigated patients-reported improvements after early dislocations within the first two years after primary THA.
Aim: The primary aim of this study was to investigate the association between first-time dislocation within the first 3 months after primary THA (early dislocation) and improvements in Oxford Hip Score (OHS) 12 months after primary THA.
Materials and Methods: This multicenter registry-based cohort study included 5,102 primary THAs due to primary osteoarthritis performed at three Danish fast-track departments from 2019 to 2024. Exclusion criteria were age less than 45 years, previous surgery of the same hip, and bilateral procedure the same day. Early dislocations were collected using the Danish Hip Arthroplasty Register (DHR). Oxford Hip Scores (OHSs) were collected routinely at baseline and 3, 12, and 24 months after surgery. Marginal mean differences (MMDs) with 95% confidence intervals (CIs) were estimated using multilevel Tobit regression and adjusted for age, sex, and the Charlson Comorbidity Index (CCI) obtained from the DHR.
Results: The incidence of early dislocation was 2.5% (125/5,102). Patients who had an early dislocation had higher age (median: 75 vs. 72 years) and CCI but their sex and body mass index were similar to patients without a dislocation. Patients who had an early dislocation had worse adjusted OHS improvements 12 months after surgery compared with patients without a dislocation (MMD: -4.4 (CI: -6.4; -2.4)). This difference remained 24 months after surgery (MMD: -5.0 (CI: -7.1; -2.8)) and was present 3 months after surgery (MMD: -6.3 (CI: -8.3; -4.4)).
Interpretation / Conclusion: Patients who had an early dislocation had worse patient-reported improvements 12 months after THA. In perspective, we should continue our efforts to minimize the incidence of dislocations.

58. Antidepressant use after revision hip and knee arthroplasty: A registry-based study

Melisa Castaneda-Vanegas[1], Yepes-Calderón Manuela[1,2], Jorge Vargas-Centeno[1], Birit F.P. Broekman[3], Rachid Mahdad[4], Maaike G.J. Gademan[1,2]

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Background: Despite extensive research on revision arthroplasty outcomes, including complications, pain, and costs, the mental health impact remains underexplored.
Aim: This study investigated antidepressant use within one year after revision total hip or knee arthroplasty (THA/TKA), comparing post-revision use with pre-revision, primary THA/TKA patients, and the general Dutch population.
Materials and Methods: Data from the Dutch Arthroplasty Register and the Foundation for Pharmaceutical Statistics (2013–2022) were linked. Patients aged ≥30 years undergoing revision THA/TKA were included. Antidepressant use was compared with pre-revision, primary THA/TKA patients, and the general population (GIP-databank). Prevalences were age- and sex-standardized. Comparisons used prevalence ratios (PR), adjusted hazard ratios (HR), and standardized prevalence ratios (SPR).
Results: The study included 8,962 revision patients (4,395 THA; 4,567 TKA), 176,445 primary arthroplasty patients (98,040 THA; 78,405 TKA), and 11,738,571 general population individuals. One year post-revision, antidepressant use was 13.5% (THA) and 15.2% (TKA), up from 12.7% and 13.6% pre-revision. Primary arthroplasty patients showed 9.3% (THA) and 10.3% (TKA) use; the general population had 9.3%. Post-revision prevalence increased significantly for TKA (PR 1.11 [95%CI 1.01–1.23]) but not for THA. Revision patients had higher hazards than primary patients (THA HR 1.48 [95%CI 1.34–1.63]; TKA HR 1.48 [95%CI 1.37– 1.61]). Revision patients had higher antidepressant use than the general population (THA SPR 1.28 [95%CI 1.18–1.38]; TKA SPR 1.45 [95%CI 1.34–1.56]).
Interpretation / Conclusion: Revision arthroplasty patients had higher antidepressant use than primary patients and the general population. Within revision patients, use at 1 year increased for TKA but not THA. These findings highlight the need for early identification, monitoring, and tailored psychological interventions alongside managing somatic symptoms such as pain and reduced mobility.

59. Total Hip Arthroplasty After Solid Organ Transplantation: A single center retrospective matched cohort analysis on Surgical outcomes and Impact on Organ Performance

Wouter Schroven[1], Jan Clerick [2], Robin Vos [3], Dirk Kuypers [4], Johan Van Cleemput [5], Stijn Ghijselings [1,6], Georges Vles [1,6]

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Background: Outcomes of total hip arthroplasty (THA) in solid organ transplant (SOT) recipients remain incompletely characterized. Chronic immunosuppression and transplant-related comorbidities may increase perioperative risks.

Aim: To compare revision risk after THA in SOT recipients versus matched controls, and to evaluate medical complications, orthopaedic outcomes, and graft-specific organ function.

Materials and Methods: This single-center retrospective matched cohort study compared patients undergoing THA after SOT with a 1:1 matched non-transplant control group. Matching was performed on age, sex, body mass index, ASA classification, and year of surgery. The primary outcome was all-cause revision surgery. Secondary outcomes included 90-day mortality, 30-day medical complications, orthopaedic complications, perioperative variables (length of hospital stay, blood transfusion requirement, postoperative hemoglobin changes, and fixation method), and graft-specific organ function.

Results: A total of 103 matched pairs were included. Revision surgery was uncommon and comparable between groups (2.9% vs 2.0%, P = 1.00). Transplant recipients demonstrated a significantly higher rate of 30-day medical complications (24/103 (23.3%) vs 2/103 (2%), P < .001). Transplant status remained independently associated with medical complications after adjustment for age, sex, ASA classification, and surgical indication (adjusted OR 12.3, 95% CI 2.4–62.0). Similar rates for prosthetic joint infection, dislocation, and implant-related complications were found. Graft-specific renal, pulmonary, and hepatic function remained stable one year postoperatively.

Interpretation / Conclusion: In conclusion, THA in SOT recipients is associated with increased early postoperative medical morbidity; however, orthopaedic outcomes and, importantly, graft-specific organ function remained preserved. These findings provide clinically meaningful reassurance that THA does not appear to compromise transplant integrity when performed within a multidisciplinary care model, while underscoring the need for careful perioperative surveillance because of the increased risk of medical complications.

60. KKR - Air-flowsystem in arthroplasty operating theaters

Lars Lykke Hermansen[1], Morten Bøgehøj [2], Thomas Jakobsen [3], Søren Overgaard [4]
1. Department of Orthopedics, University Hospital of Southern Denmark, Esbjerg; 2. Department of Orthopedic Surgery and Traumatology, Odense University Hospital, Odense; 3. Department of Orthopedics, Aalborg University Hospital, Aalborg; 4. Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital, Bispebjerg

Background: From the 1960s to the 1980s, new types of air systems designed for operating rooms were introduced with the aim of creating a cleaner environment to reduce clinical infections. It became widely accepted that Laminar Air Flow (LAF) should be the gold standard over conventional or Turbulent Air Flow (TAF). However, the conclusion following the recent International Consensus Meeting on Orthopedic Infections in 2025 was that ” *There is no evidence to demonstrate that the use of traditional LAF systems is effective in reducing Surgical Site infection or Periprosthetic joint Infection in orthopedic surgery.”*
Aim: The purpose of this review was to investigate whether there is a clinical difference in surgical site infections after hip and knee replacement surgery in patients who have undergone surgery in operating rooms with LAF compared to TAF systems, based on recent data from countries that are comparable to Denmark.
Materials and Methods: We conducted a systematic search using the PubMed database. The search protocol was generated by a research librarian. We included primary studies from 1995 and excluded systematic reviews to control the literature that the present guideline is based upon. Studies from Asia and Africa was excluded. Two independent reviewers conducted title/abstract screening and full text assessment. Conflicts were resolved by a third reviewer.
Results: 263 studies were identified and 1 additional study after screening of reference lists. 10 papers were finally included (6 register and 4 retrospective cohort studies). All studies contained data on THA, while 6 of the studies also presented data on TKA. 9 studies had a min. 1 year follow-up. 7 studies had large study populations between 30,000 and >90,000 included, while the remaining involved 1,200-11,000 participants. There was no difference between the LAF and TAF groups in 8 of the studies, while 2 studies found an association with more revisions due to infection after THA in LAF rooms.
Interpretation / Conclusion: The recent literature is not able to detect a clinically relevant, protective effect regarding infections after lower limb total joint replacement with the use of LAF systems when compared to TAF.

SESSION 14: FREE PAPER SESSION – TRAUMA

Wednesday, 11 November 2026

14:00 – 14:45

Room: Harlekin

Chairs:

Lasse Rämö
Department of Orthopaedics and Traumatology, Helsinki University Hospital, Helsinki, Finland

Michael Brix
Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark

61. Reoperation After Cannulated Screws Versus Sliding Hip Screw for Undisplaced Femoral Neck Fractures: A Post Hoc Analysis of a Trial Cohort Randomised to Internal Fixation

Michaela Manalili Hansen[1], Kristoffer Hare[1], Morten Schultz Larsen[1], Søren Kold[2], Henrik Palm[3], Per Gundtoft[4], Bjarke Viberg[1]

1. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Denmark 2. Department of Orthopaedic Surgery and Traumatology, Aalborg University Hospital, Denmark 3. Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital Bispebjerg, Denmark 4. Department of Orthopaedic Surgery and Traumatology, Aarhus University Hospital, Denmark

Background: Cannulated cancellous screws (CCS) and sliding hip screws (SHS) are commonly used for undisplaced femoral neck fractures in older adults, but comparative evidence remains inconclusive, and the optimal implant choice remains uncertain.

Aim: To compare the risk of conversion to arthroplasty, risk of any reoperation, perioperative data, and functional outcome between CCS and SHS in patients aged ≥65 years with undisplaced femoral neck fractures treated with internal fixation.

Materials and Methods: This post hoc analysis included the subgroup of patients randomised to internal fixation in the SENSE multicentre trial, in which patients with an undisplaced femoral neck fracture were randomised to either internal fixation or arthroplasty. Implant type was not randomised and followed local practice. The primary outcome was conversion to arthroplasty within 2 years, analysed using Fine-Gray regression with death as a competing event, adjusting for age, sex, smoking, alcohol, New Mobility Score (NMS), and ASA score. Secondary outcomes included any reoperation, intraoperative data, time to reoperation, and NMS at 3, 6, 12, and 24 months.

Results: A total of 159 patients were included (CCS n=108, SHS n=51). Baseline characteristics were comparable, although CCS patients were slightly older (79.2 years [95% CI 77.9-80.5] vs 76.3 years [74.3-78.3]). Within 2 years, 13/108 in the CCS group and 8/51 in the SHS group were converted to arthroplasty. The crude SHR for SHS vs CCS was 1.11 [95% CI 0.45-2.73] and 1.06 [95% CI 0.42-2.66] after adjustment. Overall, 42 patients (26%) underwent any reoperation (adjusted SHR 1.12 [95% CI 0.53-2.83]). SHS was associated with longer operative time (56 min [95% CI 49.7–62.3] vs 46 min [41.3– 50.7]) and higher intraoperative blood loss (165 mL [132.6–196.8] vs 50 mL [38.0–61.2]). Median time to reoperation was 238 days (range 8-536 days) for CCS and 270 days (range 67-691 days) for SHS. NMS was similar between groups at all follow-up time points.

Interpretation / Conclusion: SHS showed no difference in conversion to arthroplasty compared with CCS in competing-risk analyses, but was associated with longer operative time and higher intraoperative blood loss. NMS was comparable at all follow-up time points.

62. A comparison of short-acting and extended-release opioids for the treatment of postoperative pain following orthopedic surgical procedures: A systematic review.

Sila-Nisa Türkyilmaz[1,2], Pernille Lykke Petersen[3], Kristoffer W. Barfod[1,2], Ebrahim Rahdi[1,2]
1. Section of Sports Traumatology, Department of Orthopedic Surgery, Copenhagen University Hospital Bispebjerg, Copenhagen, Denmark 2. Department for Clinical Medicine University of Copenhagen 3. Department of Anaesthesia and Intensive Care, Copenhagen University Hospital - Bispebjerg and Frederiksberg, Copenhagen, Denmark

Background: Opioids are widely used for postoperative pain following orthopedic surgery. International guidelines recommend against the use of extended release (ER) opioids for postoperative pain, based on evidence from mixed-surgery populations. However, it remains unclear which formulation is the best for orthopedic patients.
Aim: To assess efficacy of pain reduction postoperative day (POD) 0-3 and serious adverse events (SAE) in patients treated with ER versus immediate-release (IR) opioids for postoperative pain following orthopedic surgical procedures
Materials and Methods: This study was a systematic review following PRISMA guidelines. MEDLINE (PubMed), Embase (Ovid), Scopus, Cochrane CENTRAL, CINAHL and PEDro were searched from January 1, 2000 to April 15, 2025. Studies were eligible if they included patients undergoing orthopedic surgery treated with IR versus ER opioids for acute postoperative pain. Primary efficacy outcome was pain measured POD 0–3. Primary safety outcome was serious adverse events (SAE). Secondary outcomes were opioid consumption, opioid-related side effects, length of hospital stay and other adverse events. Screening and data extraction were performed by two independent reviewers. Risk of bias (RoB) was assessed using Cochrane RoB2
Results: 3374 studies were identified, 73 were retrieved for full text screening and 17 included in the review. Pain relief POD 0-3 was inconsistently reported, and no direct comparison was possible. 7 studies reported better pain relief with ER opioids, 3 reported better pain relief with IR opioids and 7 found no difference. Metanalysis on SAEs showed no statistically significant difference between ER and IR opioids (p=0.56), 5 studies did not report about SAE's and 7 studies with no occurrence of SAEs. No apparent differences were observed regarding opioid consumption, opioid related side-effects, length of hospital stay, and other adverse events
Interpretation / Conclusion: Heterogeneity in outcome reporting across included studies limited direct comparison between ER and IR opioids. No statistically significant differences were found in pain reduction POD 0-3, SAE or any of the secondary outcomes.

63. Bracing after Ankle Fracture (BAF): A randomised multicentre non-inferiority internal PILOT study comparing an ankle stirrup to the standard foot-ankle brace in patients with ankle fracture

Katrine K. Krag-Andersen[1,2,3], Jonas A. Ipsen [1,2], Anders Holsgaard-Larsen [1,2], Charlotte Abrahamsen [4], Per H. Gundtoft [5], Matthew L. Costa [6], Stinus S. L. Larsen [7], Asbjørn Hróbjartsson [8], Dennis W. Hallager [9,10], Rasmus Juul [9], Jesper L. Toustrup [11], Bjarke Viberg [1,2]

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Background: Standard treatment of ankle fractures is immobilisation with a foot-ankle brace (walker). Although effective, it may delay recovery. Furthermore, patients prefer lighter ankle stirrups allowing controlled movement. The Bracing after Ankle Fracture (BAF) trial investigates whether stirrups are non-inferior to walkers in pain and function at 12 weeks post-fracture measured by the Manchester-Oxford Foot Questionnaire (MOXFQ, 0 best–100 worst).
Aim: To assess safety and feasibility of BAF.
Materials and Methods: A multicentre PILOT study (5% scaled) of the BAF trial (target sample n=1400) was conducted across four Danish orthopaedic sites. Patients (≥18 years) with surgically or non-surgically treated ankle fractures were randomised at their first follow-up (1–3 weeks post-fracture) to unrestricted weightbearing using either stirrup or walker, worn until 6 weeks post-fracture. Block randomisation (1:1) was applied and stratified by treatment (surgical/non-surgical) and into six subgroups: females and males aged 18–39, 40– 59, and ≥60 years. Recruitment continued until each subgroup included seven patients, a total of 70 patients, or three months had elapsed. Feasibility outcomes included recruitment rate, between-group differences in dropout, crossover, adverse events (AEs), and serious adverse events (SAEs). Trial procedures were evaluated by investigators and patients.
Results: In six weeks, 67 of 130 screened patients were randomised (52%) to walker (n=33) or stirrup (n=34). Of those randomised, 65% were women and the mean age was 55 years. Dropout was low (n=1, stirrup) but cross-over from stirrup was reported due to pain (n=5). No SAEs occurred, and AEs were comparable between groups (walker n=2 vs. stirrup n=1). Minor trial refinements are required, including prioritising use of a foam ankle stirrup rather than an air-inflated stirrup to improve fit and reduce crossover, and minor revisions to the randomisation procedure, including rewording and reordering a few items in the REDCap database.
Interpretation / Conclusion: BAF is safe and feasible to conduct as a multicentre trial, requiring only minor adjustments (i.e. prioritising use of a foam ankle stirrup and minor item revisions) before full-scale implementation.

64. Digital follow-up for Orthopaedic patients

Ane Djuv[1,2,3], Aksel Paulsen[1,2,4]
1. Department of Orthopedic Surgery, Stavanger University Hospital, Helse Stavanger HF, NORWAY 2. The Norwegian Fracture Register, NORWAY 3. Clinical institute 1, University of Bergen, NORWAY 4. Department of Public Health, The Faculty of Health Sciences, University of Stavanger, NORWAY

Background: An increased number of fractures due to the demographic shift widens the gap between the capacity of the health care workforce and the needs of an aging population, challenging the traditional follow-up of orthopaedic patients. Since 2021, Stavanger University Hospital (SUH) has used patient-reported outcome measures (PROM) and Digital Home Assessments (DHA) to differentiate fracture patients who need outpatient clinic (OC) control, or not. The two most common fractures at our OC are wrist and ankle fractures. Data collection was coordinated with the Norwegian Fracture Register to enable multi-use of data.
Aim: The aim was for DHA to reduce the number of follow-ups at the 6 weeks control for wrist and ankle fractures without losing follow-up data.
Materials and Methods: Adult patients (>18y) with wrist or ankle fracture, able to complete DHA received specific PROMs; wrist (PRWHE) or ankle (MOxFQ), generic PROM (EQ-5D-5L), and anchor questions. Based on the patients' responses, they were dichotomized as "having a good result" = "green" score or as "having a worse result than expected" = "red" score. Data from October 2024 (wrist fractures) and for December 2024 (ankle fractures) until 1 February 2026 included.
Results: Of 510 or 781 non-surgical or surgical treated wrist fracture patients which were included, 62% or 43% responded to the DHA at 6 weeks, respectively. 75% were female. The median age was older for the non-surgical treated group(66 vs 60 yr). 60%-76% scored "green" for PRHWE and anchor questions for wrist fractures. The response rate was 65% for both non-surgical or surgical treated ankle fracture patients and 61% or 58% were female. The age range was 18-96 years. Nine or 25 patients had been assigned to a 6-week attendance control after non-/surgical treatment by the orthopedic surgeon. 73% or 92% of those responding after non-surgical or surgical treatment of ankle fracture scored "green" and was not given an OC assessment.
Interpretation / Conclusion: 60-92% of the traditional 6-week follow-up assessments were reduced by DHA for both the wrist and ankle fractures. Several other orthopedic DHA for fractures in shoulder, clavicula and arthroplasty in the knee and hip are used in hospitals across Norway.

65. Improving Trauma Outcome Prediction: The Role of Age in Injury Severity Score based Risk Assessment and in-hospital 30-day mortality

Poul Stubkjær Petersen[1,2], Frederik Borup Danielsson [1], Bjarke Viberg [1,2]
1. Department of Orthopedic Surgery and Traumatology, Odense University Hospital 2. Department of Clinical Research, University of Southern Denmark

Background: The Injury Severity Score (ISS) quantifies trauma severity, with ISS ≥16 defining severe injury and is associated with higher mortality. Yet, ISS does not account for age. In contrast, composite prediction models such as TRISS and TRIMP incorporate age and physiological variables demonstrating higher mortality among older patients at similar injury severity. Moreover, these models were derived from older datasets and predominantly North American populations with a higher proportion of penetrating trauma, raising uncertainty about their applicability to contemporary European cohorts.
Aim: To assess the association between mortality and ISS across age groups in a multitrauma cohort.
Materials and Methods: In this retrospective cohort study, adult multitrauma patients aged 20–100 years were included from the Region of Southern Denmark trauma registry (2024–2025), with a catchment population of ~1.2 million. ISS was derived from AIS 2008. Mortality was the primary outcome and defined as in-hospital death within 30-days. The primary outcome was stratified across age groups (20–39 [young], 40–59 [middle adulthood], 60–79 [older], 80–100 [very old]), including in patients with ISS ≥16. Secondary outcomes were the relationship between ISS and mortality and the ISS corresponding to ≥20% mortality. Results are presented with 95% confidence intervals.
Results: A total of 467 patients were included; mean age 55 (36–70), 31% female, and 27 (5.8%) died in-hospital within 30 days. Mortality increased stepwise with age, from 2.2% (0.7–6.2) in young patients to 19.1% (10.4–32.5) in the very old. In ISS ≥16 mortality rose from 6.7% (1.8–21.3) in the young to 50.0% (26.8– 73.2) in the very old. Likewise, the ISS threshold for ≥20% mortality decreased from 29(19.0-50.0) in the young to 8 (1.0-16.0) in the very old.
Interpretation / Conclusion: Increasing age is associated with higher mortality at any given ISS, including within traditionally defined moderate injury ranges. In geriatric trauma patients, mortality occurs at significantly lower ISS thresholds, challenging the use of a fixed ISS ≥16 definition of severe injury. These findings support incorporating age into trauma risk assessment, triage, and management to improve care for older patients.

SESSION 15: FREE PAPER SESSION – SPINE

Wednesday, 11 November 2026

14:00 – 14:45

Room: Blomster salen

Chairs:

Joost Rutges
Department of Orthopedics and Sports Medicine, Erasmus Medical Center, The Netherlands

Søren Ohrt-Nissen
Department of Orthopaedic Surgery, Spine Unit, Rigshospitalet, Copenhagen University Hospital, Denmark

66. Cancer Risk Among Women With Scoliosis: A Nationwide Danish Register-Based Study

Frederik Damsgaard Højsager[1], Luise Borch[2,3], Rene Castelein[4], Steen Bach Christensen[5], Ane Simony[1,6]
1. Department of Orthopaedic Surgery and Traumatology, Hospital Lillebaelt Kolding, Kolding, Denmark 2. Department of Pediatric and Adolescent Medicine, Gødstrup Hospital, Denmark 3. NIDO | Centre for Research and Education, Gødstrup Hospital, Denmark 4. Department of Orthopedics, University Medical Center Utrecht, Utrecht, The Netherlands 5. Department of Orthopaedic Surgery, University Hospital Rigshospitalet, Copenhagen, Denmark 6. Department of Regional Health Research, University of Southern Denmark, Odense, Denmark

Background: Adolescent Idiopathic Scoliosis (AIS) affects over 1% of adolescents and is often diagnosed during a sensitive developmental period, with repeated radiographs, potentially increasing cancer risk. Previous studies have suggested an association between scoliosis and breast cancer, but have been limited by small cohorts, lack of matched controls, and incomplete registry data.
Aim: The aim of this study, therefore, was to assess the hazard ratio (HR) of cancer among women with scoliosis compared to age-matched controls using nationwide registry data.
Materials and Methods: This observational cohort study included all Danish women born 1967–1977 with a scoliosis diagnosis (ICD-8 735.0/735.2 or ICD-10 DM411), and four age-matched controls per case, identified through national health registers. Cancer outcomes were obtained from the Danish National Cancer Register, and Cox regression was used to estimate HRs, with time at risk, beginning at age 12.
Results: Among 6,217 women (1,238 (20% with scoliosis), the mean follow-up time was approximately 38 years. The HR (95% CI) for any cancer was 1.06 [0.85-1.31]. For breast cancer, HR was 1.25 [0.86-1.80], while HR for carcinoma in situ (CIS) of the breast was 13.62 [3.75-49.50]. Among 12 cases of ovarian cancer, the HR was 2.91 [0.92-9.18]. This study could not, however, discriminate between idiopathic and non-idiopathic scoliosis.
Interpretation / Conclusion: Women with scoliosis showed a significantly increased HR for CIS of the breast, and a non-significant trend toward increased risk of invasive breast and gynecologic cancers. Findings support further investigation into genetic or developmental links between scoliosis and cancer risk.

67. Tumor-Specific Survival Changes After Surgery for Metastatic Spinal Cord Compression: A 15-Year Comparative Cohort Study

Nicolai Hovmand Fogh[1], Søren Morgen[1], Aya Rosborg Bak[1], Martin Heegaard[1], Søren Ohrt-Nissen[1], Martin Gehrchen[1], Benny Dahl[1]
1. Orthopaedic, Spine Unit, Rigshospitalet, Copenhagen, Denmark

Background: Prognostic scoring systems for metastatic spinal cord compression (MSCC) are based on historical tumor-specific survival estimates. Advances in systemic oncological treatment may have altered contemporary prognoses within individual tumor entities in regard to surgery for MSCC.
Aim: This study evaluated changes in tumor-stratified survival after surgery for MSCC.
Materials and Methods: Patients treated surgically for MSCC in 2008–2013 and 2017–2023 were included in this one-center cohort study. Patients were followed for up to 2 years after surgery or until death, whichever occurred first. Baseline variables included age, sex, ASA score, BMI and tumor type focusing on the four most frequent tumor types: Non-Small Cell Lung Cancer (NSCLC), prostate, breast and renal cell carcinoma. Survival was analyzed using restricted mean survival time (RMST) over 24 months and Kaplan–Meier 2-year survival proportions.
Results: A total of 823 patients were included, 472 in 2008–2013 and 351 in 2017–2023. Between the two study periods, we found no differences in age, ASA-score or tumor distribution. Minor differences were observed in BMI (p=0.033) and sex distribution. Overall RMST increased from 9.5 months (95% CI 8.7–10.3) in 2008–2013 to 12.7 months (95% CI 11.7–13.7) in 2017–2023 (difference 3.18 months, p<0.001). Two-year survival increased from 18.9% (95% CI 15.3–22.4) to 34.8% (95% CI 29.8–39.7). Breast cancer survival at 2 years increased from 37.0% (25.9–48.1) to 69.8% (56.0–83.5). Prostate cancer increased from 22.0% (11.5–32.6) to 65.4% (47.1–83.7). Renal cell carcinoma increased from 12.9% (1.1–24.7) to 42.9% (21.7–64.0).In contrast, NSCLC showed no improvement (14.2% [8.1–20.2] vs 9.0% [2.1–15.8]).
Interpretation / Conclusion: Although the present study may reflect a change in patient selection, it may also reflect the general improved survival in breast, prostate and renal cancer over the past decade. These shifts in tumor-specific survival suggest that historical prognostic estimates may no longer reflect current survival outcomes and should be reassessed to optimize prognostic assessment and surgical decision-making.

68. What is the association between pain intensity and pain tolerance during exercise in individuals undergoing low back rehabilitation? A cross-sectional study

Nikolaj Sindberg Walther[1], Morten Villumsen[2,3], Louise Mortensen [4,5], Nanna Rolving [4,5,6]
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Background: In low back pain (LBP) rehabilitation, pain during exercise can limit participation. Although intensities up to 5 on the Numeric Rating Scale (NRS) are often considered acceptable, guidelines lack thresholds for acceptable pain during exercise. Pain intensity does not always reflect tolerability. Clarifying their association may aid in more supportive, individualized pain guidance.
Aim: To investigate the association between pain intensity and pain tolerance ratings obtained during exercise in individuals undergoing LBP rehabilitation.
Materials and Methods: A cross-sectional study was conducted in a municipal rehabilitation course. Here, 33 participants rated their pain during exercises on several occasions using both the Numeric Rating Scale (NRS) and the Traffic Light Scale, indicating whether the pain was no or minimal, acceptable, or unacceptable. Differences in NRS scores across Traffic Light Scale categories were compared using the Mann-Whitney test.
Results: A total of 105 paired pain ratings were collected, each comprising both the NRS and Traffic Light Scale. Although pain tolerance categories showed statistically significant differences in NRS scores, participants often rated the same NRS value as both "acceptable" and "unacceptable". Specifically, NRS 1-9 was reported as "acceptable pain," and NRS 4-9 as "unacceptable pain," indicating considerable overlap in what was considered acceptable or unacceptable pain intensity during exercise.
Interpretation / Conclusion: In individuals undergoing LBP rehabilitation, pain intensities of NRS 4-9 were reported as both acceptable and unacceptable. This underscores the complexity of pain measurement during rehabilitation, as the same NRS score may be considered acceptable or unacceptable by different individuals. Based on these findings, we suggest evaluating pain tolerance, rather than pain intensity, during exercise to better optimize and individualize LBP rehabilitation.

69. Fusion selection for surgical treatment of thoracic adolescent idiopathic scoliosis with Lenke C modifier

Jacquelynn Matthews[1,2], Thomas Fornitz[3], Trine Kongensgaard[3], Antti Saarinen[4], Brandon Ramo[1,5], Ilkka Helenius[4], Martin Gehrchen[3], Benny Dahl[3], Megan Johnson[1,5], Søren Ohrt-Nissen[3]
1. Scottish Rite for Children, Dallas, TX, USA; 2. UT Southwestern School of Medicine, Dallas, TX, USA; 3. Department of Orthopaedic Surgery, Spine Unit, Rigshospitalet, Copenhagen University Hospital, Denmark; 4. Department of Pediatric Orthopaedic Surgery, University of Turku and Turku University Hospital, Finland; 5. Department of Orthopaedic Surgery, UT Southwestern Medical Center, Dallas, TX, USA.

Background: Selective fusion for adolescent idiopathic scoliosis (AIS) Lenke 1 and 2 curves with C modifier is well established, but selection of the lowest instrumented vertebra (LIV) remains controversial. Some surgeons select LIV at the end or stable vertebra (SV) for spontaneous lumbar correction, whereas others extend distally to correct surgically. Both approaches bear risks of coronal decompensation and lumbar progression.
Aim: To evaluate the effect of LIV selection on lumbar curve correction and coronal imbalance in main thoracic, C-modifier curves.
Materials and Methods: This retrospective, multi-site study included all AIS Lenke 1C and 2C patients who underwent selective fusion defined by LIV above the apex of the lumbar curve. Data was collected preoperatively, postoperatively, and at 2-years. Patients were grouped as proximal (LIV at or proximal to SV) and distal (LIV caudal to SV).
Results: Eighty-seven patients were included (34 proximal, 53 distal). Preoperatively, the proximal group had a larger main curve (61±9° vs 57±11°, p=0.043) but no difference in lumbar curve (45±7° overall) or coronal balance (15±12mm overall). At 2 years, the proximal group had a larger lumbar curve (28±9° vs 23±10°, p=0.007) with no difference in coronal balance (13±10mm overall). On multivariable linear regression, 2-year lumbar curve was independently associated with a distal LIV (-4°, p=0.04) and Lenke 2C curves (-8°, p<0.001). Also, larger preoperative main curve (0.38°/degree, p<0.001) and lumbar flexibility (0.23°/degree, p=0.048) predicted larger lumbar curve at 2-years (adjusted R^2=0.37). Predictors of 2-year coronal imbalance were preoperative coronal balance (0.32mm/mm, p<0.001) and lumbar apical translation (0.12mm/mm, p=0.009), with no effect of LIV selection or curve characteristics (adjusted R^2=0.45).
Interpretation / Conclusion: This study is the largest analysis of selective fusion for Lenke 1C and 2C curves and demonstrates that 2-year lumbar curve correction and coronal imbalance are determined by different factors. Fusion distal to SV reduced residual lumbar curve, whereas coronal imbalance was dictated by preoperative coronal alignment, rather than selected fusion level.

70. Clinical guideline on bracing for the treatment of low-energy thoracolumbar fractures

Søren Wittorff Sørensen[1,2], Daniel Bomark[3,4], Dennis Winge Hallager[4,5], Mikkel Østerheden Andersen[1,2]
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Background: In Denmark, most patients who sustain low-energy fractures in the thoracolumbar spine are treated non-surgically with bracing. However, the evidence supporting this practice is unclear.
Aim: To develop a clinical guideline on the use of brace treatment for older adults who sustain an acute low-energy thoracolumbar spine fracture.
Materials and Methods: A systematic literature search for guidelines, reviews, and randomized controlled trials was performed with the assistance of a research librarian. The search strategy was structured according to the following PICO question: Population: Acute, low-energy thoracolumbar fracture in adults aged ≥ 50 years without neurological deficit or ankylosing spondylitis in a hospital setting Intervention: Any type of brace in addition to standard care Comparator: Standard care alone Outcome: Disability (critical outcome). Pain, quality of life, radiological fracture progression, delayed neurological deficit or conversion to surgery (secondary outcomes). Outcomes were assessed in the short (≤ 3 months) and long term (> 3 months). Screening, evaluation of bias, and grading of evidence were performed by medical doctors in duplicate using standardized instruments: Covidence, Cochrane risk of bias 2 and GRADE. Recommendations were based on the GRADE approach and adhere to Danish National Clinical Guidelines terminology.
Results: The search yielded 89 studies. After screening by title, abstract and full text, only a single relevant study remained: an RCT comparing no brace to either soft or rigid brace. There was no difference between either type of brace compared to no brace for disability, pain or progression of vertebral collapse in the short term. Delayed neurological deficit or conversion to surgery and all long term outcomes were not reported. The quality of evidence for bracing was rated very low overall.
Interpretation / Conclusion: Consider using brace to prevent secondary neurological deficits or surgery in patients treated non-surgically for low-energy thoracolumbar spine fractures, as available evidence cannot rule out considerable benefits of the current treatment regime. Very low-quality evidence suggests no difference in disability, pain or fracture progression.

71. Clinical guideline on the use of CT and outpatient follow up for low-energy thoracolumbar fractures

Daniel Bomark[1,2], Søren Wittorff Sørensen[3,4], Mikkel Østerheden Andersen[3,4], Dennis Winge Hallager[5,2]
1. Department of Orthopaedic Surgery, Zealand University Hospital, Nykøbing Falster, Denmark 2. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark 3. Center for Spine Surgery and Research, Lillebaelt Hospital, Kolding, Denmark 4. Department of Regional Health Research, Faculty of Health Services, University of Southern Denmark, Odense, Denmark 5. Department of Orthopaedic Surgery, Zealand University Hospital, Køge, Denmark

Background: Low-energy thoracolumbar fractures are common among older adults and are typically managed non-surgically. In Denmark, patients are often evaluated with plain radiographs supplemented by computed tomography (CT) and are routinely offered outpatient follow-up. However, the evidence supporting these practices remains unclear.
Aim: To inform the development of clinical guidelines on the use of CT imaging and planned outpatient follow-up in adults aged ≥50 years with acute low-energy thoracolumbar fractures.
Materials and Methods: Two systematic literature reviews were conducted with the assistance of an information specialist. The reviews addressed: 1) CT in addition to plain radiographs versus plain radiographs alone, and 2) planned outpatient follow-up versus no planned follow-up in adults aged ≥50 years with acute low-energy thoracolumbar fractures. Outcomes included disability, pain, quality of life, fracture progression, delayed neurological deficit, treatment changes, complications and need for surgery. Screening, risk-of-bias assessment, and assessment of certainty of evidence were performed independently by two reviewers using Covidence. Additionally, a national survey of Danish spine surgeons was conducted to explore attitudes towards CT use in this patient population.
Results: The literature searches identified 779 studies for the CT review and 292 studies for the follow-up review. After title, abstract, and full-text screening, no eligible studies remained for either review. Consequently, no direct evidence was identified regarding the effect of CT imaging or planned outpatient follow-up. The survey achieved an 86% response rate (n=24) and revealed substantial variation in attitudes towards CT imaging, reflecting the absence of evidence-based practice.
Interpretation / Conclusion: No eligible studies were identified for either clinical question, highlighting a substantial evidence gap in the management of low-energy thoracolumbar fractures. Consider avoiding routine CT unless deemed relevant to treatment. Outpatient follow-up with standing radiographs is considered good clinical practice until progressive fracture deformation has stabilized and adequate pain control has been achieved.

SESSION 16: NOF/DOS BEST PAPER - THE ANDERS RYDHOLM AWARD

Wednesday, 11 November 2026

15:30 – 16:15

Room: Congress Hall

Chairs:

Kristoffer Weisskirchner Barfod
Department of Orthopedic Surgery, Section for Sports Traumatology, Copenhagen University Hospital Bispebjerg–Frederiksberg, Copenhagen, Denmark

Søren Kold
Interdisciplinary Orthopaedics, Aalborg University Hospital, Denmark

177. Locking plate fixation versus tension-band wiring for patellar fractures: a multicentre randomised controlled trial

Peter Larsen[1,2], Rikke Thorninger [3,4], Rasmus Severinsen [3], Jens-Christian Beuke [5], Steffen Skov Jensen [6], Morten Kjerri Rasmussen [6], Juozas Petruskevicius [4], Jeppe Barckman [4], Niels Henrik Bruun[7], Rasmus Elsoe [1]
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Background: Patellar fractures are associated with considerable postoperative morbidity and standard tension-band wiring is linked to high complication rates and suboptimal outcomes. Locking plate fixation is a recent surgical innovation that confers superior biomechanical stability, yet clinical evidence remains limited.
Aim: This trial aims to compare locking plate fixation with tension-band wiring in patients requiring surgical treatment for patellar fractures.
Materials and Methods: In this patient- and assessor-blinded, multicentre randomized trial, 122 adults with displaced patellar fractures were assigned 1:1 to locking plate fixation or standard tension-band wiring. The primary outcome was patient-reported knee function measured by the five subscales of the Knee Injury and Osteoarthritis Outcome Score (KOOS) at 12 months. Superiority was predefined as a statistically significant difference in at least three KOOS subscales exceeding the minimal clinically important difference (pain 10, symptoms 9, ADL 6, sport and recreation 10, quality of life 10). Secondary outcomes included additional clinical, functional, and safety measures.Analyses were performed according to the intention-to-treat principle.
Results: Sixtythree patients were assigned to locking plate fixation and 59 to tension-band wiring; 90.5% and 88.1%, respectively, completed 12-month follow-up. Locking plate fixation resulted in statistically significant and clinically meaningful improvements in three KOOS subscales at 12 months: symptoms (mean difference –10.4; 95% CI –16.4 to –4.4), sport and recreation (– 14.1; 95% CI –24.7 to –3.4), and quality of life (–10.9; 95% CI –19.0 to –2.7). Hardware removal, osteosynthesis failure, and reoperation occurred more frequently after tension-band wiring.
Interpretation / Conclusion: Locking plate fixation yielded superior patient-reported outcomes compared with tension-band wiring at 12 months, providing high-level evidence supporting plate fixation as a preferred surgical technique for displaced patellar fractures

178. Non-operative versus operative treatment of weightbearing stable suprasyndesmotic ankle fractures: a prospective, multicentre, randomised controlled trial.

Ola Saatvedt[1,2,4], Marius Molund [3], Frede Frihagen [3,4], Peter Schubert [5], Håvard Furunes [1,4]
1. Department of Orthopedic Surgery, Innlandet Hospital Trust Gjøvik Hospital, Gjovik, Norway 2. Department of Orthopedic Surgery, Oslo Universitetssykehus, Oslo, Norway 3. Department of Orthopedic Surgery, Østfold Hospital Trust, Sarpsborg, Norway 4. University of Oslo Faculty of Medicine, Oslo, Norway 5. Department of Radiology, Østfold Hospital Trust, Sarpsborg, Norway

Background: Suprasyndesmotic (Weber C) ankle fractures are considered unstable injuries and are routinely treated operatively. However, surgical treatment and prolonged immobilisation increases the risk of complications and may delay rehabilitation. Emerging evidence suggests that ankle stability may be preserved in fractures demonstrating congruency on weightbearing radiographs
Aim: This trial aimed to compare functional, clinical and radiological outcomes of non-operative versus operative treatment of weightbearing stable suprasyndesmotic ankle fractures. We hypothesised that non-operative treatment would be non-inferior to operative management.
Materials and Methods: We conducted a prospective, randomised, parallel-group non-inferiority trial at four hospitals in south-east Norway. Adults aged 18–70 years with isolated suprasyndesmotic fibular fractures demonstrating a congruent ankle mortise on weightbearing radiographs were randomised to operative or nonoperative treatment. Both groups were allowed weightbearing as tolerated. The primary outcome was the Olerud–Molander Ankle Score (OMAS) at two years. Secondary outcomes included Manchester– Oxford Foot Questionnaire, pain, health-related quality of life, ankle range of motion, radiographic union, syndesmotic reduction on CT, post-traumatic osteoarthritis, and complications.
Results: A total of 120 patients were randomised (59 operative, 61 non-operative). At 24 months follow up OMAS score was 3.6 points higher in the non-operative group compared to the operative group (mean difference 3.6, 95% CI −2.1 to 9.4). Secondary patient-reported outcomes were comparable between groups, supporting the non-inferiority claim. 17 patients in the operative group had progression of their ankle arthritis from baseline compared to 7 patients in the nonoperative group. Operative treatment was associated with procedure-related complications, including infections and implant removal, whereas crossover from non-operative to operative treatment was uncommon.
Interpretation / Conclusion: In patients with weightbearing stable suprasyndesmotic ankle fractures, nonoperative treatment results in functional outcomes non-inferior to operative management at two years, with fewer treatment-related complications.

179. A simple trephination does not increase the healing potential for all-inside meniscal repair in the vascular zones: A double blinded randomized controlled trial

Niels Christian Kaldau[1], Mikkel Attrup[1,2], Kasper Krommes[1], Caroline Kjær Bardrum, Per Hølmich[1]
1. Sports Orthopedic Research Center Copenhagen (SORC-C), Department of Orthopedic Surgery, Amager-Hvidovre Hospital, Copenhagen University Hospital, Denmark; 2. Søernes Privathospital, Copenhagen, Denmark

Background: Prospective studies combining trephination needling technique with suturing of meniscal lesions during meniscal repair have demonstrated improved clinical outcomes.
Aim: To investigate if trephination combined with all-inside repair of meniscal lesions, would improve knee function and healing rates compared to all-inside repair alone.
Materials and Methods: 18-45-year-old patients with a meniscal lesion deemed reparable were included in a double blinded clinical randomized trial from 2013-2020. The primary outcome was the patient reported outcome KOOS (Knee Osteoarthritis Outcome Score) 'Sport/rec' 0-100 subscale after one year. Secondary outcomes included clinical healing rates reoperation rates, complications, remaining KOOS subscales, as well as the Lysholm and IKDC (International Knee Documentation Committee) scores. After stratification for concomitant anterior cruciate ligament injury and randomization, surgeries were performed with an all-inside suture technique. In participants randomized to the trephination group, trephination was performed in the vascular zone of the meniscus before suturing.
Results: From 112 randomized participants, 108 were included in the analysis. 55 (50.9%) had trephination (aged 27.7±6.4y, 38% females [n=21]); and 53 (49.1%) did not (aged 26.6±6.6y, 36% females [n=19]). Both groups improved on the primary outcome, KOOS Sport/rec after 12 months (mean change 43.5 points (CI: 34.7-52.3) in the trephination group vs. 51.2 points (CI: 43.6-58.8) in the control group). No between-group difference in the primary outcome (KOOS Sport/rec at 12 months, p=0.150), or age, sex, weekly hours of sport, location of meniscal injury or self-reported outcomes were observed (p>0.05). There were no differences between groups in clinical healing (p>0.05). Across groups, the failure rate was 29 % (31/108). All patient reported improved outcomes in both groups in Lysholm, IKDC and other KOOS subscales, but no statistically significant between-group difference was observed (p>0.05).
Interpretation / Conclusion: Adding trephination to all inside meniscal suture of meniscal lesions in the vascular zone is not effective in improving patient-reported outcomes or clinical healing rates.

180. Enhancing patient empowerment in knee arthroplasty: effects of motivational interviewing in a randomized controlled trial

Siri Heijbel[1,2], Helena Lindqvist[3], Josefine E-Naili[4,5], Martin Thorsell[6], Andreas Edvardsson[1], Lene Lindberg[7], Margareta Hedström[1,8]

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Background: Knee arthroplasty (KA) relieves pain and improves function in advanced osteoarthritis, yet 10% of patients remain dissatisfied. Patient empowerment is increasingly used to facilitate participation in health care. Motivational interviewing (MI) may support self-care, but evidence of improved outcomes after KA is limited, inconsistent, and lacks assessments of MI fidelity.

Aim: This RCT evaluated whether a patient empowerment intervention using MI and additional physiotherapist (PT) access improved satisfaction and other patient-reported outcomes after KA. It was hypothesized that it would increase the proportion of satisfied patients.

Materials and Methods: Patients were recruited from an urban high-volume orthopedic hospital in Stockholm, Sweden, operating mainly ASA class I-II. 149 patients undergoing primary KA were consecutively included and randomized 1:1 to standard care or standard care plus telephone-based MI-sessions, 1 session preoperatively and 6 monthly sessions postoperatively, and weekly telephone access to a KA-experienced PT. The analyses followed an intention-to-treat approach. Primary outcomes were high and overall satisfaction with the knee and with rehabilitation at 12 months, assessed by 2 solitary questions followed by a 5-point Likert scale. Secondary outcomes were knee awareness (FJS), knee-related outcomes (KOOS), health-related quality of life (HRQoL) (SF-36), perceived improvement of the operated knee, and functional performance (5TSTS at-home test). MI fidelity was assessed using MITI 4.2.1 coding

Results: The intervention did not increase the odds of high satisfaction (knee, OR 1.00 (95% CI 0.50-2.00); rehab, OR 1.00 (CI 0.50-2.00)) or overall satisfaction (knee, OR 0.67 (95% CI 0.31-1.43); rehab, OR 0.83 (CI 0.36-2.00)) at 12 months. Neither did the intervention improve any secondary outcomes. MI fidelity was acceptable and above predefined thresholds.

Interpretation / Conclusion: A patient empowerment intervention using MI and additional access to PT did not improve satisfaction, knee symptoms, HRQoL, or functional performance in the described KA population. Future research could explore subgroups with greater needs for MI or other interventions that may enhance patient empowerment.

181. Single versus Multiple Prophylactic Antibiotic Doses for Preventing Periprosthetic Joint Infection After Total Hip Replacement: A Pragmatic, Nationwide Cluster-Randomized Crossover Noninferiority Trial - The Pro-Hip-Quality Trial

Armita Armina Abedi[1,2], Claus Varnum[3,4], Alma Becic Pedersen[4,5], Tobias Haugegaard[7,8,9], Kirill Gromov[10], Jesper Hallas[11], Pernille Iversen[12], Thomas Jakobsen[13,14], Espen Jimenez-Solem[15], Kristian Kidholm[16], Anne Kjerulf[17], Jeppe Lange[18,19], Flemming Schønning Rosenvinge[21], Søren Solgaard[22], Marc Stegger[23], Robin Christensen[7,8,9], Søren Overgaard[1,2], For the Pro-Hip-Quality Trial Group

1. Department of Orthopedic Surgery and Traumatology, Copenhagen University Hospital Bispebjerg, Copenhagen, Denmark. 2. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark. 3. Department of Orthopedics, Lillebaelt Hospital - University Hospital Southern Denmark, Vejle, Denmark. 4. Department of Regional Health Research, University of Southern Denmark, Odense, Denmark. 5. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark. 6. Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark. 7. Section for Biostatistics and Evidence-Based Research, the Parker Institute, Bispebjerg and Frederiksberg Hospital, Copenhagen, Denmark. 8. Research Unit of Rheumatology, Department of Clinical Research, University of Southern Denmark, Odense University Hospital, Odense, Denmark. 9. Cochrane Denmark & Centre for Evidence-Based Medicine Odense (CEBMO), Department of Clinical Research, University of Southern Denmark, Odense, Denmark. 10. Department of Orthopedic Surgery, Copenhagen University Hospital, Hvidovre Hospital, Hvidovre, Denmark. 11. Department of Public Health, Clinical Pharmacology, Pharmacy, and Environmental Medicine, University of Southern Denmark, Odense, Denmark. 12. The Danish Clinical Quality Program – National Clinical Registries (RKKP), Copenhagen, Denmark. 13. Department of Orthopedics, Aalborg University Hospital, Aalborg, Denmark. 14. Department of Clinical Medicine, Aalborg University, Aalborg, Denmark. 15. Department of Clinical Pharmacology, Bispebjerg Hospital, Copenhagen, Denmark. 16. Centre for Innovative Medical Technology, Odense University Hospital, Odense, Denmark. 17. Infectious Disease Epidemiology & Prevention, Statens Serum Institut, Copenhagen, Denmark. 18. Department of Orthopedic Surgery, Regional Hospital Horsens, Horsens, Denmark. 19. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark. 20. Department of Orthopaedic Surgery, Copenhagen University Hospital Rigshospitalet, Copenhagen, Denmark. 21. Department of Clinical Microbiology, Odense University Hospital, Odense, Denmark; Research Unit of Clinical Microbiology, University of Southern Denmark, Odense, Denmark 22. Department of Orthopedic Surgery, Copenhagen University Hospital Herlev–Gentofte, Hellerup, Denmark 23. Department of Sequencing and Bioinformatics, Statens Serum Institut, Copenhagen, Denmark. *The Pro-Hip-Quality Trial Group: Jens Peter Alva-Jørgensen24, Anders Assenholt25, Salar Bajalan26, Khuram Bashir27, Shahin Behzadi28, Steffen Hoel Bruun29, Anders Mark Diernæs30, Andreas Ebbe Bording Hermann31, Martin Haagen Haubro32, Micael Haugegaard33, Christian Hofbauer34, Peter Birk Hollænder35, Peter Frederik Horstmann22, Stig Storgaard Jakobsen36, Niels Krarup Jensen37, Peter Jensen38, Jens Knoke39, Lars Lykke Hermansen40, Wjeha Malik27, Jacob Fyhring Mortensen25, Christian Skovgaard Nielsen10, Peter Hvidbak Revald3, Mathias Bæk Rasmussen41, Thomas Rohde42, Mohamed Abdelrahim Shalaby43, Mikael Skov44, Nikolaj Palasin Sode1, Kjeld Søballe45, Jesper Stork-Hansen46, Mikkel Sylvest Sundstrup47, Müjgan Yilmaz48 24. Department of Orthopedics, Herlev and Gentofte Hospital, Herlev, Denmark 25. Department of Orthopedics, Regional Hospital Viborg, Denmark 26. Aleris, Ringsted, Denmark 27. Department of Orthopedics, Zealand University Hospital, Køge, Denmark 28. Department of Orthopedics, Randers Regional Hospital, Denmark 29. Department of Orthopedics, Holbæk Hospital, Denmark 30. Department of Orthopedics, Aalborg University Hospital, Frederikshavn, Denmark 31. Adeas Private Hospital, Denmark 32. Kolund Private Hospital, Denmark 33. Gildhøj Private Hospital, Brøndby, Denmark 34. Capio Private Hospital, Odense, Denmark 35. Department of Orthopedics, Regional Hospital Silkeborg, Denmark 36. Department of Orthopedics, Aarhus University Hospital, Denmark 37. Capio Private Hospital, Aarhus, Denmark 38: aCure Private Hospital, Denmark 39: Department of Orthopedics, Hospital of Southern Jutland, Aabenraa, Denmark 40: Department of Orthopedics, University Hospital of Southern Denmark, Esbjerg, Denmark 41: Department of Orthopedics, Aalborg University Hospital, Farsø, Denmark 42: Aleris-Hamlet Hospital, Søborg, Denmark 43: Capio Private Hospital, Hellerup and Odense, Denmark 44: Department of Orthopedics, Gødstrup Regional Hospital, Denmark 45: Mølholm Private Hospital, Vejle, Denmark 46: Department of Orthopedics, Næstved Hospital, Denmark 47: CHP Private Hospital, Denmark 48: North Zealand Hospital, Hillerød, Denmark

Background: Periprosthetic joint infection (PJI) is a serious complication following total hip arthroplasty (THA). The optimal number of antibiotic prophylaxis doses remains uncertain due to the limited evidence available.
Aim: We evaluated whether a single preoperative antibiotic dose is noninferior to a 24-hour multiple-dose regimen in preventing PJI within 90 days after primary THA for osteoarthritis.
Materials and Methods: The Pro-Hip-Quality trial was a nationwide, cluster-randomized, crossover, noninferiority study including all public and private hospitals in Denmark. Adults undergoing primary THA for osteoarthritis over a two-year period were included. Hospitals (clusters) were randomly assigned to administer either single-dose prophylaxis (one preoperative dose) or multiple-dose prophylaxis (one preoperative plus three postoperative doses within 24 hours) for one year, then crossed over to the alternate regimen the following year. The primary outcome was PJI within 90 days. The intention-to-treat population included all patients undergoing surgery conditional on hospital and cluster-year. The primary analysis used a generalized linear mixed model with a random effect for clinical center and fixed effects for treatment, period, and their

interaction. Data were obtained from national administrative and microbiology registries. Noninferiority of single-dose prophylaxis was defined as the upper boundary of the two-sided 95% confidence interval for the odds ratio being less than 1.4 compared with multiple-dose prophylaxis.
Results: A total of 22,446 patients from 35 clusters were randomly assigned to receive either a single dose (11,049) or multiple doses within 24 hours of surgery (11,397). PJI occurred in 115 of 11,049 (1.04%) in the single-dose group and 110 of 11,397 (0.97%) in the multiple-dose group. The odds ratio was 1.068 (95% confidence interval [CI], 0.820 to 1.392) for PJI, with noninferiority of a single dose demonstrated
Interpretation / Conclusion: The single-dose regimen was noninferior to the multiple-dose regimen for preventing PJI within 90 days after surgery, demonstrating that one preoperative antibiotic dose is not less effective than multiple doses in preventing PJI after THA.

SESSION 17: FREE PAPER SESSION – TRAUMA

Thursday, 12 November 2026

13:30 – 14:15

Room: Vandsalen

Chairs:

Aleksi Reito
Department of Musculoskeletal Diseases, Faculty of Medicine and Health Technology, Tampere University Hospital, Tampere, Finland

Annie Primdahl
Department of Orthopedics, Esbjerg and Grindsted Hospital, University Hospital of Southern Denmark Denmark

72. When surgeons ‘screw’ the guideline: osteosynthesis vs arthroplasty for displaced femoral neck fractures in patients with dementia - a nationwide register-based target trial emulation of an RCT

Simon Storgaard Jensen[1,2], Per Hviid Gundtoft[3], Rob G.H.H. Nelissen[4], Jan-Erik Gjertsen[5,6], Alma B. Pedersen[1,2]

1. Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark; 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark; 3. Department of Orthopaedic Surgery, Traumatology, Aarhus University Hospital, Aarhus, Denmark; 4. Department of Orthopaedics, Leiden Universitair Medisch Centrum, Leiden, The Netherlands; 5. Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Norway; 6. Department of Clinical Medicine, University of Bergen, Norway.

Background: Arthroplasty is guideline-recommended for displaced femoral neck fractures (FNF), but the optimal treatment for patients with dementia remains uncertain. Current guidelines are largely based on RCTs in which cognitively impaired patients are underrepresented. We therefore emulated this target trial using nationwide registry data.

Aim: To compare arthroplasty versus osteosynthesis in patients aged ≥70 years with dementia and a displaced FNF.

Materials and Methods: We conducted a nationwide target trial emulation using Danish health registry data from 2012 to 2021. A target trial emulation mimics the structure of an RCT using registry data. Patients were grouped by primary surgical treatment, and analyses followed an intention-to-treat approach. The primary outcome was any reoperation. Secondary outcomes were major reoperation, all-cause mortality, length of hospital stay, early mobilisation, and postoperative decline in baseline mobility. To minimize baseline confounding, we applied multiple imputation and inverse probability of treatment weighting. Weighted cumulative incidences were estimated with death as a competing event, and weighted cause-specific hazard ratios (HRs) were calculated with 95% confidence intervals (CIs).

Results: We included 3,161 patients: 2,231 treated with arthroplasty and 930 with osteosynthesis. After weighting, the groups were well balanced. At 365 days, the weighted cumulative incidence of any reoperation was 13% (CI 13–14) after arthroplasty and 7.6% (CI 7.0–8.3) after osteosynthesis, corresponding to a weighted HR of 0.52 (CI 0.39–0.69). The weighted cumulative incidence of major reoperation was 8.6% (CI 8.2–8.9) after arthroplasty and 7.6% (CI 7.1–8.2) after osteosynthesis, corresponding to a weighted HR of 0.84 (CI 0.63–1.13). The weighted mortality was 47% (CI 46–48) after arthroplasty and 43% (CI 42–44) after osteosynthesis, corresponding to a weighted HR of 0.86 (CI 0.77–0.98). Arthroplasty was associated with a slightly longer length of hospital stay, while mobilisation outcomes were similar between groups.

Interpretation / Conclusion: Treatment with osteosynthesis was associated with a lower risk of reoperation, lower mortality, and a slightly shorter hospital stay than arthroplasty treatment.

73. Nonoperative treatment vs volar locking plate fixation for distal radius fracture in patients aged 65 years or older (DRIFT trial): the 24-month results of a randomised controlled trial

Teemu Hevonkorpi[1,2], Antti Launonen [1], Aleksi Reito [1], Mette Skjærbæk [4], Yan Li [3], Toni Luokkala [6], Juha Kukkonen [9], Juha Paloneva [5], Helle Østergaard [4], Li Felländer-Tsai [3], Minna Laitinen [7], Bakir Sumrein [1,2], Inger Mechlenburg [8], Ville Mattila [1,2]

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Background: The optimal management of distal radius fractures (DRF) in older adults remains under debate, particularly in cases where fracture alignment is lost during early nonoperative treatment.
Aim: We compared nonoperative management with volar locking plate (VLP) fixation for primarily malaligned DRFs and for fractures that developed early malalignment following successful closed reduction.
Materials and Methods: The DRIFT was a prospective, multicentre, randomised controlled trial conducted at five trauma centres in Finland, Sweden, and Denmark. Patients aged 65 years or older with a dorsally displaced AO type A or C DRF were eligible. Patients whose DRF failed to maintain acceptable alignment after closed reduction (CR) were randomly assigned to nonoperative treatment or VLP fixation. Patients with acceptable alignment after CR, who demonstrated loss of reduction at 5–10 days, were separately randomised to continue nonoperative treatment or to VLP fixation. The 12-month results of the trial have been published earlier. The primary outcome of this analysis was the Patient-Rated Wrist Evaluation (PRWE) score at 24 months, analysed using a linear mixed model.
Results: Between March 2018 and June 2023, a total of 291 patients were enrolled (mean age 73 years (SD 5.8); 258 women (89%)). In patients with primarily malaligned fractures, the mean difference of PRWE at 24 months was -5.1 points (95% CI [-12.6, 2.3]) in favour of VLP, which was clearly smaller than the predefined minimal clinically important difference (MCID) of 10.5 points. In patients who lost alignment during early follow-up, no clinically relevant difference in PRWE was observed between treatment groups at 24 months (mean difference 0.6 points, 95% CI [-8.8, 9.9])
Interpretation / Conclusion: In older adults with DRFs, operative fixation with a VLP offers a small functional benefit in fractures with malalignment after closed reduction; however, the between group difference appears to disappear between one and two years after the fracture. There is no benefit of operative treatment when alignment is lost during early nonoperative management. These findings question the value of routine early radiographic follow-up during cast treatment.

74. Risk of Reoperation Following Tension Band Wiring and Tension Band Suture Fixation in Olecranon Fractures

Liv Vesterby[1], David Karimi[1], Benedicte Heegaard[1], Rasmus Wejnold Troest[1], Jeppe Vejlgaard Rasmussen[1,2], Tazio Maleitzke[2,3,4,5], Dennis Karimi[3]

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Background: Tension band wiring (TBW) is used to treat displaced olecranon fractures: however, it is associated with a high risk of reoperation. To address this limitation of TBW, an all-suture fixation technique, also known as tension band suture fixation (TBSF), has been introduced. Yet, comparative studies evaluating the safety of the two procedures remain sparse.

Aim: The aim was to compare the risk of reoperation within two years of surgery following TBW or TBSF.

Materials and Methods: This is a retrospective multicenter cohort study including patients ≥18 years who sustained an olecranon fracture and were treated with TBW or TBSF between January 2018 and January 2024. Patients were identified using ICD-10 codes of proximal ulna fracture (s520a/b) and the NOMESCO Classification of Surgical Procedure codes for 'fracture surgery of elbow and forearm'. Patients with fractures other than Mayo type 2A/B, concomitant elbow fractures, pathological fractures and peri-implant fractures were excluded. Data on reoperations were obtained through retrospective chart review. Primary outcome was reoperation within two years of surgery. Logistic regression was used to estimate odds ratios (ORs) with 95% confidence interval [CI] for reoperation. Adjustments were made for age, sex and wound complications.

Results: A total of 395 patients were identified; 39 were excluded due to fracture type, leaving 192 TBW and 162 TBSF patients. The two groups were similar regarding demographics. The proportion of reoperation was 41% for TBW and 9% for TBSF. Indications for reoperation included infection (4% vs 2%), implant failure (14% vs 1%), nerve palsy (2% vs 1%), elbow stiffness (2% vs 2%), and implant discomfort (20 vs 2%). TBW was associated with an increased risk of reoperation compared with TBSF (adjusted OR 7.6 [95% CI 4.1-14.2]). After excluding implant discomfort, TBW remained associated with an increased risk of reoperation (adjusted OR 3.7 [95% CI 1.8-7.6]).

Interpretation / Conclusion: TBW was associated with an increased risk of reoperation compared with TBSF in the treatment of Mayo type 2 olecranon fractures. After exclusion of reoperations for implant discomfort, TBW was still associated with a nearly fourfold increased risk of reoperation.

75. Prolonged opioid usage after surgically treated pelvic fracture in working aged patients: prevalence, demographics, and multivariable prediction model

Elina Ekman[1], Rasmus Liukkonen[2], Aleksi Reito[2]
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Background: Pelvic fracture (PF) is a serious injury that can lead to prolonged opioid use. However, the issue has not been studied at a national level.
Aim: We aimed to report the demographics and prevalence of opioid use after surgically treated PF in a working-age population in Finland. The secondary aim was to investigate how accurately baseline predictors can predict prolonged use.
Materials and Methods: Using nationwide registries, we identified all Finnish inhabitants aged 18 to 65 years undergoing PF surgery between 2015 and 2021 (n = 233). These patients' demographic data, depression, trauma mechanisms, opioid purchases and socioeconomic status were retrieved. The primary outcome was the prolonged opioid usage, defined as having one or more opioid prescription filled after the first three postoperative months. Logistic regression and Poisson zero-inflated (ZIP) regression analyses were performed to examine the predictors of prolonged opioid usage. The results are reported as adjusted odds ratios (aORs) or adjusted incidence rate ratios (aIRRs) with 95% confidence intervals.
Results: At 3–12 months and 6–12 months postoperatively, 40.3% and 33.0% of patients used opioids (at least one prescription), respectively. Preoperative opioid use (3–12 months: aOR 6.59, 95% CI [2.23, 24.38]; ZIP-aOR 0.16, 95% CI [0.05, 0.50]; aIRR 2.19, 95% CI [1.81, 2.64]) was the single most important predictor of postoperative opioid use. Depression (aOR 2.08, 95% CI [1.09, 4.02]; ZIP-aOR 0.48, 95% CI [0.25, 0.92]) showed modest effect at 3-12 months. Predictive performance of the regression for postoperative opioid-use were low based on R2 and AUC values. Among those who used opioids at one year, 14.2% were opioid-naive before the fracture.
Interpretation / Conclusion: Prolonged opioid use was common. At one year one in seven previously opioid-naive PF patients became opioid dependent. The predictive ability of the regression models for prolonged opioid use was modest and preoperative opioid use the most important predictor.

76. BioFACTS – Biomarkers in the Diagnosis of Acute Compartment Syndrome

Abraham Nilsson[1], Thomas Ibounig[2,3], Lasse Rämö[2,3], Johan Lyth[4], Björn Alkner[5], Ferdinand von Walden[6], Lotta Fornander[7], Andrew Schmidt[8], Jörg Schilcher[9]

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Background: Acute compartment syndrome (ACS) is a feared complication of limb trauma. Left untreated, rising pressure strangles the enclosed muscle, causing necrosis, disability, or limb loss. Fasciotomy has long been the only accepted way to halt this process, and fear of missing ACS has hardened into a reflex — when in doubt, fasciotomize. Yet fasciotomy is itself consequential, leaving open wounds, skin grafts, chronic pain, and paresthesia — sequelae rarely separated from those of ACS. Decisions are made in the dark: signs are subjective, pressure thresholds unreliable, and fasciotomy rates vary widely between surgeons.
Aim: We tested whether myoglobin or creatine kinase (CK) could distinguish ACS from tibial fracture and measured long-term outcomes.
Materials and Methods: BioFACTS is a prospective multicentre study in Sweden and Finland. Myoglobin and CK were measured regularly after trauma and stratified by trauma energy, fracture type, sex, and age. At one year we recorded Lower Extremity Functional Scale (LEFS), pain on walking Numeric Rating Scale (NRS), and paresthesia. Biomarkers are reported as mean (95% CI).
Results: We enrolled 343 patients with tibial fractures (60% male, mean age 42) and 18 fasciotomized for suspected ACS (72% male, mean age 40). Myoglobin at 0–6 h was similar: 307 µg/L (237–377) after fracture and 496 (229–764) after fracture and fasciotomy, adjusted difference −33 µg/L (p=0.74). Myoglobin tracked injury severity, reaching 825 (503–1148) after high-energy versus 189 (164–214) after low-energy trauma. CK showed similar results. At one year the fracture group had less pain on walking (NRS 1.5 vs 3.5, p=0.04), better function (LEFS 61 vs 51, p=0.03), and less paresthesia than the fracture group with fasciotomy.
Interpretation / Conclusion: Had ACS been present, myoglobin and CK should have risen with both ischaemic damage and surgical insult; yet levels were no higher after fasciotomy than after fracture alone. The simplest reading of our findings is that many fasciotomized patients never had ACS, and their poorer one-year function reflects the consequence of the additional fasciotomy. The field needs criteria independent of treatment, and a randomised trial.

SESSION 18: FREE PAPER SESSION – HIP/KNEE ARTHROPLASTY

Thursday, 12 November 2026

13:30 – 14:15

Room: Pjerrot

Chairs:

Ann Ganestam
Department of Orthopaedic Surgery, Copenhagen University Hospital, Denmark

Alfredas Smailys
Department of Orthopaedics and Traumatology, Lithuanian University of Health Sciences, Kaunas, Lithuania

77. Spinal anaesthesia versus general anaesthesia (SAGA) on recovery after hip and knee arthroplasty: three randomized, single-blinded, multi-centre, clinical trials

Christian Bredgaard Jensen[1], Kirill Gromov[1], Claus Varnum[2], Lina Pleckaitiene[3], Henrik Kehlet[4], Anders Holten Springborg[5], Thomas Quaade Bandholm[6], Nicolai Bang Foss[5], Anders Troelsen[1]
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Background: Spinal anaesthesia (SA) is commonly used in fast-track hip and knee arthroplasty but may delay early mobilisation due to motor blockade. Intravenous general anaesthesia (GA) may facilitate earlier mobilisation.
Aim: We aimed to compare early mobilisation after total hip arthroplasty (THA), total knee arthroplasty (TKA), or medial unicompartmental knee arthroplasty (mUKA) when using SA or GA.
Materials and Methods: The SAGA trial comprises three parallel randomized controlled trials with 74 patients in each procedure group (THA, TKA, mUKA). Patients were randomized to receive either GA or SA within a standardized fast-track protocol. The primary outcome was the proportion of patients safely walking 5 meters within 6 hours of surgery, analysed using logistic regression. A modified intention-to-treat approach was applied. Secondary outcomes were discharge-readiness at 6 hours, pain and postoperative nausea and vomiting (PONV) at 4 and 6 hours (during rest/activity), and oral morphine equivalents (OME) during the first 6 hours.
Results: Of 222 included patients, 214 had available primary outcome data. At 6 hours postoperatively, safe mobilisation was observed in 94.4% of GA vs 82.9% of SA patients after THA (OR=0.37 [95% CI: 0.05– 1.9]), 69.7% of GA vs 77.8% of SA after TKA (OR=1.5 [95% CI: 0.48–4.8]), and 81.1% of GA vs 91.9% of SA after mUKA (OR=2.6 [95% CI: 0.63–13.0]). Discharge readiness did not differ at 6 hours. In THA, pain scores were higher in GA compared with SA at 4 hours (difference 1.77 during activity), while no consistent differences were observed in TKA or mUKA. PONV was comparable between groups across all procedures. Opioid consumption was consistently higher in GA compared with SA across all procedures.
Interpretation / Conclusion: No overall significant or clinically relevant difference in early mobilisation was observed between GA and SA after hip and knee arthroplasty. However, while not clinically significant, GA tended to yield better mobilisation in THA, whereas SA yielded better mobilisation in TKA and mUKA. GA patients received more opioids and experienced slightly higher pain.

78. Prior osteotomy around the knee does not impair patient-reported outcomes after total knee arthroplasty: a Swedish registry-based study

Ioannis Syrikas[1,2], Ioannis Karikis[1,2,4], Neel Desai[2,3], Ola Rolfson[2,3], Annette W-Dahl[5], Georgios Tsikandylakis[2,3]
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Background: Knee osteotomy is a joint-preserving treatment for unicompartmental osteoarthritis, but some patients later undergo total knee arthroplasty (TKA). Whether prior osteotomy affects patient-reported outcomes (PROs) after TKA remains uncertain.
Aim: To compare 1-year postoperative PROs after TKA in patients with prior osteotomy around the knee and matched controls with primary osteoarthritis and no prior major surgery on the operated knee.
Materials and Methods: A nationwide registry-based study was conducted using data from the Swedish Arthroplasty Register and its integrated osteotomy module for the period 2000–2021. Cases with prior osteotomy (OSTEOA) were matched 1:2 to controls by age, sex, BMI, ASA class, type of articulation, and surgical period. Outcomes included preoperative and 1-year postoperative satisfaction and pain on 5-point Likert scales, KOOS-12, and EQ-5D-3L.
Results: After matching, satisfaction was analyzed in 662 OSTEOA and 1,324 controls; pain in 282 and 564; KOOS-12 in 460 and 920; and EQ-5D-3L in 471 and 942, respectively. At 1 year, 76% (95% CI 72–79) of OSTEOA patients and 80% (78–82) of controls were satisfied or very satisfied. Moderate or severe pain was reported by 20% (16–25) and 20% (17–24), respectively. KOOS-12 total scores were similar between groups (mean difference −0.9, 95% CI −2.8 to 1.4), as were EQ-5D-3L index scores (mean difference 0.01, −0.01 to 0.03).
Interpretation / Conclusion: Prior osteotomy around the knee did not impair 1-year PROs after TKA and should not be considered a negative prognostic factor for short-term patient-reported outcome after TKA.

79. Implementing Imageless Robotic Assisted Total Knee Replacement Surgery as standard care in a high turnover hospital. A learning curve analysis

Walter van der Weegen[1], Rogier van Drumpt[1]
1. Sports & Orthopedics Research Centre, St. Anna Hospital, Geldrop, the Netherlands

Background: Robotic-assisted total knee arthroplasty (RA-TKA) improves implant positioning accuracy, but concerns remain regarding increased operative time and efficiency, particularly when implemented as standard care across an entire department.
Aim: To evaluate operating room (OR) efficiency, surgery duration, and the learning curve during the first 1000 consecutive RA-TKA procedures after adoption as the standard technique.
Materials and Methods: A retrospective cohort study included 1000 consecutive primary unilateral RA-TKA procedures performed between July 2023 and February 2025. Four orthopedic surgeons without prior robotic experience performed all surgeries using an imageless robotic system. Surgery duration and OR time ("wheels in– wheels out") were analyzed. Learning curves were assessed using cumulative sum (CUSUM) analysis to identify the transition from learning phase (LP) to proficiency phase (PP). Complications, revisions, readmissions, and patient-reported outcomes (pain and Oxford Knee Score) were compared between phases.
Results: Median surgery duration decreased from 59 to 40 minutes, and OR time from 105 to 80 minutes over the study period. CUSUM analysis demonstrated a turning point at 25–62 cases per surgeon. Median surgery time improved from 48–62 minutes in LP to 42–51 minutes in PP. OR time decreased from 89– 104 minutes to 81–92 minutes. Complication rates decreased from 7.7% to 3.5% (p=0.081), while revision and readmission rates showed no significant differences. Patient-reported outcomes were similar between phases.
Interpretation / Conclusion: Implementation of RA-TKA as standard care is associated with a clear learning curve, with proficiency achieved after approximately 25–60 cases. Surgical efficiency improves substantially without compromising short-term clinical outcomes.

80. Effects of hip strengthening exercise in patients undergoing revision total hip replacement: 12-month follow-up from a multicenter randomized controlled trial

Martin Gade Stisen[1,2], Alma Becic Pedersen[1,3], Troels Kjeldsen[1,2], Frederik Nicolai Foldager[1,2], Martin Lamm[2], Anders Assenholt[4], Kirstine Lyngsøe Hvidberg[4], Morten Kjerri Rasmussen[4], Peter Kloster Aalund[5], Christina Frølich Frandsen[6], Anders Holsgaard-Larsen[7,8], Martin Haagen Haubro[7], Theresa Bieler[9], Søren Overgaard[10,11], Torben Beck[12], Claus Varnum[13,14], Erik Thorlund Parner[15], Inger Mechlenburg[1,2]

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Background: Functional recovery after revision total hip replacement (THR) is often prolonged, yet evidence to guide postoperative rehabilitation in this population remains limited. The long-term effects of structured exercise compared with standard rehabilitation have not been established.
Aim: The aim of this study is to compare the effectiveness of an exercise intervention targeting hip strengthening (NEMEX-STR) on functional performance at 12 months with the standard community-based rehabilitation (Usual care) in participants undergoing revision THR.
Materials and Methods: This study reports 12-month follow-up results from a multicenter, randomized, controlled, parallel-group, assessor-blinded superiority trial conducted at eight hospitals, with participants recruited between November 2022 and June 2024, including 84 participants undergoing first-time revision after primary THR. Participants were randomized to NEMEX-STR (n = 43) or Usual care (n = 41). NEMEX-STR consisted of a 16-week intervention targeting hip strengthening, while Usual care consisted of standard rehabilitation. The primary outcome was the between-group difference in change in the 30-second Chair Stand Test from baseline (prior to surgery) to 12 months after initiation of rehabilitation. Secondary outcomes included the Hip Disability and Osteoarthritis Outcome Score, the 40-meter Fast-Paced Walk Test, the 9-step Timed Stair Climb Test, unilateral leg extensor muscle power, Global Perceived Effect, and adverse events. Analyses were conducted according to the intention-to-treat principle using mixed-effects models.
Results: The mean changes from baseline to 12-month follow-up in the 30-second Chair Stand Test were 2.2 (95% CI 1.0 to 3.4) in NEMEX-STR and 2.0 (95% CI 0.8 to 3.3) chair stands in Usual care, with a between-group difference of 0.2 (95% CI -1.5 to 1.9), below the threshold for a clinically meaningful difference. Additionally, there were no clinically relevant between-group differences in improvements for secondary outcomes.
Interpretation / Conclusion: An exercise intervention targeting hip strengthening was not superior to standard community-based rehabilitation for improving functional performance at 12 months in patients undergoing revision THR.

81. Autologous impaction bone grafting of a cemented acetabular cup in primary total hip arthroplasty in young patients: A randomized controlled trial

Diederik R. de Boer[1], Patricia Pasman[1], Roelina Munnik-Hagewoud[1], Martijn J.Q. Steinweg[1], Mireille A. Edens[2], Pieter B.A.A. van Driel[1], Harmen B. Ettema[1]
1. Department of Orthopaedics, Isala Hospital, Zwolle, The Netherlands 2. Epidemiology Unit, Department Innovation and Science, Isala Hospital, Zwolle, The Netherlands

Background: Total hip arthroplasty (THA) in younger patients (<60 years) has a higher revision risk than in older patients, mainly due to long-term wear and inadequate primary acetabular fixation. Impaction bone grafting (IBG) may strengthen the bone-cement interface and potentially reduce long-term acetabular loosening. While IBG is established in revision THA and primary THA with acetabular defects, its use in younger patients without such defects remains unexplored.
Aim: To evaluate the clinical and radiological outcomes of autologous acetabular IBG with a cemented cup in primary THA in younger patients without acetabular defects.
Materials and Methods: In this single-center, triple-blinded randomized controlled trial, patients were allocated to primary THA with a cemented acetabular cup with IBG (IBG group) or without IBG (control). Patient-reported outcome measures were collected up to one year postoperatively, with the Hip disability and Osteoarthritis Outcome Score (HOOS) activities of daily living (ADL) subscale as the primary endpoint. Perioperative data, complications, and revisions were recorded. Acetabular cup position and fixation were assessed on radiographs at one year.
Results: A total of 131 patients were randomized, including 65 patients in the IBG-group. No significant differences were observed on the primary or other patient-reported outcomes. The IBG group had significantly longer operative time (+7.5 minutes, $p<0.001$) and higher blood loss (+100 mL, $p=0.001$). Complication and revision rates were comparable. The IBG-group had significantly fewer radiolucent lines in the bone-cement interface than the control group at one-year follow-up ($p<0.001$). Compared to preoperatively, the postoperative position of the center of rotation was less superior and medial in the IBG-group ($p=0.024$).
Interpretation / Conclusion: Autologous IBG in primary THA with a cemented acetabular cup in younger patients resulted in comparable short-term clinical results to standard cementation. Fewer radiolucent lines observed with IBG suggest superior early fixation, with possible benefits for long-term cup survival.

SESSION 19: FREE PAPER SESSION – HAND/WRIST

Thursday, 12 November 2026

13:30 – 14:15

Room: Columbine

Chairs:

Marie Anneberg Brahe
Department of Orthopaedics, Aalborg University Hospital, Denmark

Marcus Alexander Landgren
Department of Orthopedic Surgery, Hand Surgery Unit, Copenhagen University Hospital Herlev and Gentofte, Denmark

82. Accelerometer based physical activity of operatively and non-operatively treated distal radius fracture patients – A secondary analysis of the multicenter, randomized, controlled trial

Lisa Tønning[1,2], Teemu Hevonkorpi[3,4], Antti Launonen[3], Aleksi Reito[3], Mette Skjærbæk[5], Toni Luokkala[6], Helle Østergaard[5], Minna Laitinen[7], Bernd Grimm[8], Inger Mechlenburg[1,2], Ville Mattila[3,4]
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Background: Distal radius fracture (DRF) is the most common upper-limb fracture. While most patients recover well, some experience prolonged deficits. Objective methods, such as accelerometer-based activity monitoring, may offer insights to evaluate outcome.
Aim: This secondary analysis of the DRIFT trial (ClinicalTrials.giv: NCT02879656) aimed to compare high-intensity upper-limb activity 12 months after operative versus non-operative treatment of malaligned DRFs in patients aged ≥65 years, assess the impact of fracture alignment, and evaluate whether DRF patients reach activity levels comparable to healthy older adults.
Materials and Methods: The DRIFT trial was a multicenter, randomized controlled trial. Patients with malaligned DRFs were randomized to operative treatment with volar locking plate (VLP) or non-operative treatment. Patients with well-aligned DRFs formed a separate non-randomized group. High-intensity upper-limb activity was measured using wrist-worn accelerometers at 3 and 12 months. Healthy controls aged ≥65 years were recruited for comparison. The primary analysis method was a linear mixed model.
Results: 157 patients and 59 healthy controls were included. At 12 months patients with malaligned fractures treated operatively had 37.2 minutes/day of high-intensity activity in the affected upper-limb versus 27.8 minutes/day for those treated non-operatively (adjusted difference: 8.5 minutes/day, 95% CI: 0.3 to 16.6). Fracture alignment had no significant impact. Compared to healthy controls, operatively treated patients differed by -2.7 minutes/day (95% CI: -8.3 to 13.6), whereas non-operatively treated patients differed -12.4 minutes/day (95% CI: -20.4 to -4.4).
Interpretation / Conclusion: Operative treatment of malaligned DRFs improves high-intensity upper-limb activity at 12 months, reaching levels comparable to healthy older adults.

83. Phased introduction of a new trapeziometacarpal arthroplasty: Early clinical outcomes and complications of the ELiS Konos implant

Heidi Lyng Andersen[1], Janni Kjærgaard Thillemann[1,2,3], Maiken Stilling[2,3], Torben Bæk Hansen[1,2]
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Background: Trapeziometacarpal (TMC) total joint arthroplasty is increasingly used to treat painful TMC arthritis. New TMC arthroplasty designs should be introduced stepwise and demonstrate outcomes comparable to those of recent successful arthroplasties.
Aim: To assess early complications and postoperative outcomes of a new TMC total joint arthroplasty introduced to the commercial market in 2023.
Materials and Methods: From March 2024 to January 2026, a consecutive cohort of 224 ELiS cementless hydroxyapatite-coated TMC arthroplasties with a conical Konos press-fit cup were operated at Goedstrup Hospital. Postoperative cast-immobilization was applied for 3 weeks. Perioperative complications were reported for all patients. The first 123 patients (131 implants, 96 females), who completed 1-year follow-up, had a mean age of 60 years (range 43-76), and were evaluated for postoperative complications, secondary surgeries, and patient-reported Quick Disabilities of the Arm, Shoulder, and Hand (QDASH) score. Implant survival was estimated using Kaplan-Meier analysis.
Results: Perioperative trapezial fractures occurred during cup impaction in 4 (1.8%) of all operated hands (n=224). Fracture healing was achieved with internal fixation (K-wires or screws) and 6 weeks of immobilization (n=2), or with 6 weeks of immobilization alone (n=1), whereas the last fracture required primary trapeziectomy (n=1). In the 1-year follow-up cohort (n=131), secondary surgeries included De Quervain's tenosynovitis (n=7; 5.3%), carpal tunnel release (n=6; 4.6%), and removal of heterotopic ossification with exchange of the head/neck (n=1; 0.8%). The QDASH was mean 45 points (CI95% 38–53) preoperatively and improved by mean 32 points (CI95% 19–45) to mean 13 points (CI95% 3–24) at 1-year follow-up. No arthroplasties were revised, resulting in a cumulative implant survival rate of 100% at 1- year.
Interpretation / Conclusion: The ELiS cementless TMC arthroplasty with a press-fit Konos cup showed low complication and reoperation rates, 1-year QDASH scores comparable to other TMC arthroplasty designs, and high early implant survival, supporting continued use with monitoring in accordance with the phased introduction principle.

84. Does Concurrent Extensor Carpi Ulnaris Tendon Pathology Influence Outcomes of TFCC Foveal Repair?

Mads Dochedahl Winther[1], Robert Gvozdenovic [1]
1. Department of Hand Surgery, Herlev/Gentofte University Hospital of Copenhagen

Background: The triangular fibrocartilage complex (TFCC) provides ulnar wrist stability, and tears of its foveal insertion can cause ulnar-sided wrist pain and grip weakness. The extensor carpi ulnaris (ECU) tendon sheath is intimately associated with the TFCC, and ECU pathology frequently coexists with TFCC foveal tears.
Aim: We hypothesized that concurrent and untreated ECU pathology (tenosynovitis or subluxation) would worsen recovery after TFCC foveal fixation.
Materials and Methods: We performed a retrospective review of 111 patients who underwent transosseous TFCC foveal repair between January 2013 and December 2023. Patients were divided into two groups: those with preoperative ECU pathology (ECU tenosynovitis or subluxation on exam/imaging or prior steroid injection, n = 18) and those without (n = 93). Primary endpoint was qDASH score measured preoperatively and at 3, 6, 12, and 24 months postoperatively. Secondary endpoints were visual analog scale (VAS) for pain at activity and contralateral grip strength ratio. Reoperation rates and ECU status postoperatively were examined as well.
Results: The two groups were comparable in age, sex distribution, and comorbidities. Mean preoperative scores did not differ significantly. Postoperatively, the mean qDASH and VAS for pain improved significantly, however no difference was found between the two groups at any timepoint. At 24 months the mean qDASH was 17.77 (CI95: 6.75 ; 28.79) and 24.54 (CI95: 18.1 ; 30.98) for the ECU pathology and unaffected group respectively (p = 0.27). Grip strength improved in both groups over the follow-up period and approached near-normal ratios by 2 years (0.94 vs. 0.88; p = 0.384), with no significant between-group difference. No patients in the ECU pathology group required ECU stabilizing surgery following foveal TFCC fixation. In contrast, 4 patients without prior ECU issues developed instability or pain and had ECU subsheath reconstruction done.
Interpretation / Conclusion: Contrary to our hypothesis, patients with concurrent ECU pathology did not fare worse after TFCC foveal repair. These results suggest that isolated TFCC repair provides symptomatic relief irrespective of pre-existing ECU tendon issues.

85. Predicting the level of function in elderly patients with distal radius fracture.

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Background: Fractures of the distal radius (DRF) are frequent in the elderly population. Most often caused by a simple fall on an outstretched hand. The injury is usually treated with cast immobilization, if the fracture is nondisplaced or minimally displaced, whereas displaced and unstable fractures require surgical fixation in patients with moderate to high level of function. Despite being a common fracture type, there is still an ongoing debate regarding the optimal treatment regime, especially for patients over 65 years of age. The choice of treatment largely depends on the patient's level of activity and functional demands. In the Capital Region of Denmark, the Clinical Frailty Scale (CFS) has been implemented to estimate the level of frailty in patients with DRF. Based on this assessment, the appropriate treatment regime is selected. CFS has become increasingly used, in the orthopaedic surgical settings. However, the reliability of CFS has not yet been investigated in patients with DRF.
Aim: We hypothesized that healthcare providers and hand surgeons would show good agreement in their assessments, as measured by the Intraclass Correlation Coefficient (ICC).
Materials and Methods: A total of 115 patients were prospectively included in the study during their visit. Each patient was assessed using the CFS; by two hand surgeons, a staff nurse, and by self-assessment, all blinded to each other's assessment. After the outpatient visit, the patients were contacted by telephone and assessed a final time by the primary investigator. In total, each patient underwent five independent CFS assessments. ICC were calculated for all observations with sub analysis; with and without patients' own observation. For all the observation, ICC were calculated using a one-way random effects model.
Results: Preliminary results show an ICC 0.81 (0.75 - 0.86) indicating a good agreement between the different raters, with even higher agreement ICC 0.83 (0.77 - 0.87) observed when calculations were limited to healthcare providers only.
Interpretation / Conclusion: Preliminary results showing good agreement in the assessment of patients' CFS levels, we believe that the reliability of the CFS is sufficient to assess frailty in patients with DRF.

86. Excellent long-term outcomes of Moovis press-fit and screw cups in revision TMC arthroplasty

Tricia Hedegaard Mølvadgaard[1,2,3], Janni Kjærgaard Thillemann[1,2,3], Torben Bæk Hansen[1,2], Maiken Stilling[1,2,3]
1. Department of Orthopaedics, Gødstrup Regional Hospital, Herning, Denmark 2. Department of Clinical Medicine, Graduate School of Health, Aarhus University, Aarhus, Denmark 3. Department of Orthopaedics, Aarhus University Hospital, Aarhus, Denmark

Background: Primary trapeziometacarpal (TMC) arthroplasty is now commonly used to treat TMC arthritis, and the survival rates of newer TMC arthroplasty concepts have improved. However, the evidence for revision TMC arthroplasty remains limited.
Aim: We assessed the combined long-term outcomes of two cementless cup designs in revision TMC arthroplasty.
Materials and Methods: Between 2013 and 2022, the Moovis press-fit cup (n=4) and Moovis screw cup (n=25) were inserted during TMC arthroplasty revisions in 29 hands (23 females/6 males). The stem (Elektra) was not revised. Patient age was mean 59 (range 46-75) years at revision surgery. Bone graft was used in 23 cup revision surgeries. Clinical and patient-reported outcomes were evaluated prospectively. Complications, implant-related secondary procedures, and revisions were evaluated until the final cross-sectional follow-up. Cup survival was estimated using Kaplan-Meier analysis.
Results: There were no intraoperative fractures. One patient had secondary surgery with the insertion of a longer neck (M from S) due to clicking and pseudo-locking of the arthroplasty joint. One press-fit and one screw cup and cup were revised to a trapeziectomy at 5 (loose cup) and 13 months (continued pain), respectively. One patient was lost to follow-up after 2 years. The last available cross-sectional follow-up (n=26) after revision TMC arthroplasty was conducted after mean 9.1 (range 5.3 – 12.3) years. Pain (0-10) at rest was mean 0.7 (CI95 0.1 – 1.3) points and pain in activity was 1.7 (CI95 0.6 – 2.7) points. Pinch-strength was mean 2.9 (CI95 2.4 – 3.5) kg and grip strength was mean 23 (CI95 19 – 28) kg. QDASH was mean 23 (CI95 15 – 32) points. Satisfaction (NRS >8) was 96%, and willingness to repeat the procedure was 96%. Cup survival was 93.10% (CI 0.75– 0.98) at 10 years (n=11).
Interpretation / Conclusion: Cementless Moovis press-fit and screw cups in revision TMC arthroplasty revealed excellent long-term survival with high patient satisfaction and willingness to repeat the procedure. In the context of the growing adoption of primary TMC arthroplasty, this study emphasizes the clinical value of revision TMC arthroplasty and highlights the need for revision cup systems.

SESSION 20: FREE PAPER SESSION – SPORTS

Thursday, 12 November 2026

13:30 – 14:15

Room: Harlekin

Chairs:

Berte Bøe
Department of Orthopaedic Surgery, Oslo University Hospital, Norway

Adam Witten
Sports Orthopedic Research Center – Copenhagen (SORC-C), Department of Orthopedic Surgery, Copenhagen University Hospital, Denmark

87. Differences between males and females in patient-reported outcomes and complications following anterior cruciate ligament reconstruction

Nanna Grane Mertz[1], Niels Christian Kaldau[2], Per Hölmich[3], Adam Witten[4]
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Background: Anterior cruciate ligament reconstruction (ACLR) is a commonly performed procedure aimed at restoring knee function after injury. Previous research has suggested that gender may influence outcomes after ACLR. However, the patterns and underlying causes are still not well defined. Large-cohort data, such as those from the Danish Knee Ligament Reconstruction Registry (DKRR), can help clarify patterns and ultimately improve treatment.
Aim: To investigate: 1) Gender differences in Knee Injury and Osteoarthritis Outcome Score (KOOS-4) one year after primary ACLR, and 2) gender differences in complication rates and post-surgery activity level.
Materials and Methods: In this registry study, demographic data, KOOS- 4 scores, complication rates, and Tegner scores for patients undergoing ACLR between 2005 and 2025 were obtained from the DKRR. An unpaired T-test was used for the KOOS-4 analysis, Chi-square tests were used to compare complication rates, and the Mann– Whitney U test was used for Tegner score analysis. Bonferroni correction was applied to account for multiple comparisons.
Results: Data from 6,438 patients (2,631 females; mean age 25 years (SD+-10), 3,807 males, mean age 26 (SD+-9) were included in the analyses. There was no gender difference in the mean 1- year postoperative KOOS-4 score (females: 70.6; males:70.3, p=0.44). Females had significantly more reoperations (4.9% vs. 3.2%, p<0.017) and non-surgical complications (13.7% vs. 10.8%, p<0.017) after ACLR than males, with chronic pain and restricted knee range of motion being some of the most frequently reported non-surgical complications. 3,196 patients reported a pre-injury Tegner score of 6 or higher (pivoting sports). Among these patients engaged in pivoting sports, females had a significantly lower likelihood of returning to their sport after ACLR compared to males (39% vs 52%, p<0.001).
Interpretation / Conclusion: Female gender was associated with an increased risk of both surgical and non-surgical complications, as well as a lower likelihood of returning to pivoting sports after ACL reconstruction. However, these differences were not captured by postoperative KOOS-4 scores.

88. Tibial tubercle osteotomy improves outcomes after MPFL reconstruction irrespective of TTTG distance

Bjørn Borsøe Christensen[1], Torsten Grønbech Nielsen[2], David Kocemba[1], Ole Gade Sørensen[2], Martin Lind[2]
1. Department of orthopedics, Horsens Regional Hospital 2. Department of orthopedics, Aarhus University Hospital

Background: Tibial tubercle–trochlear groove (TTTG) distance greater than 15 mm is traditionally used as an indication for adding tibial tubercle osteotomy (TTO) to medial patellofemoral ligament (MPFL) reconstruction. The clinical benefit of this approach remains uncertain.
Aim: The aim of this study was to investigate the effect of adding TTO to MPFL reconstruction on patella instability recurrence, patient-reported outcomes, and revision surgery in patients with TTTG distances below and above 15 mm.
Materials and Methods: A total of 1,018 operations for patellofemoral instability were analyzed. 501 patients had a TTTG <15 mm and 517 patients had a TTTG ≥15 mm. Patients were treated either with isolated MPFL reconstruction (n=767) or with combined MPFL and TTO (n=251). Outcomes included redislocation, resubluxation, revision rates, Kujala score, Banff Patella Instability Instrument (BPII 2.0), patient satisfaction, and willingness to undergo surgery again.
Results: Overall redislocation rates were comparable between patients with TTTG <15 mm and those with TTTG ≥15 mm (10% vs 10%, p=0.73). In patients with TTTG <15 mm, redislocation occurred in 10% after isolated MPFL compared with 1% after MPFL + TTO (p=0.02), and resubluxation occurred in 46% versus 28% (p=0.01). In patients with TTTG ≥15 mm, redislocation occurred in 12% after MPFL compared with 6% after MPFL + TTO (p=0.04), resubluxation in 43% versus 35% (p=0.06), and revisions in 8.3% versus 2.2% (p=0.004). Patient-reported outcomes including Kujala and BPII 2.0 scores, overall satisfaction, and willingness to undergo surgery again did not differ significantly between groups.
Interpretation / Conclusion: Although a TTTG distance of 15 mm is classically used to determine whether to perform TTO in addition to MPFL reconstruction, our findings show that adding TTO reduces redislocations and revision rates significantly regardless of TTTG distance. Patient-reported outcomes, satisfaction, and willingness to undergo surgery again did not differ between groups, indicating that the main advantage of adding TTO lies in lowering the risk of recurrent patella instability rather than improving subjective outcome measures.

89. Increasing Meniscal Repair Rates During ACL Reconstruction Did Not Increase Reoperation Risk: A Temporal Analysis from 2015 to 2023

Anders Stålmanålman[1,2], Christoffer Von Essen[1,2], Riccardo Cristiani[1,2]
1. Stockholm Sports Trauma research Center, MMK, Karolinska Institutet, Stockholm 2. Cspio Artro Clinic, FIFA Medical Center of Excellence, Stockholm, Sweden

Background: Meniscal preservation during anterior cruciate ligament reconstruction (ACLR) has increased substantially over the past decade, with a shift from resection to repair. However, concerns remain that expanding indications for repair may lead to higher reoperation rates and worse short-term outcomes.
Aim: To evaluate temporal trends in meniscal procedures during ACLR and compare reoperation rates and patient-reported outcomes between 2015–2019 and 2020– 2023.
Materials and Methods: A retrospective cohort study of 2748 knees undergoing primary ACLR with concomitant meniscal procedures at a single center between 2015 and 2023. Patients were stratified into two periods (2015–2019 vs. 2020–2023). Meniscal reoperations within two years were identified. Patient-reported outcomes were assessed using KOOS4, including minimal important change (MIC), patient acceptable symptom state (PASS), and treatment failure (TF). Multivariable logistic regression adjusted for potential confounders.
Results: Meniscal repair rates increased from 18.0% to 30.2%, while resections decreased from 21.1% to 15.1% ($p<0.001$). Reoperation rates did not differ between cohorts for repairs (9.0% vs. 11.4%, n.s.) or resections (5.0% vs. 3.9%, n.s.). Combined medial and lateral procedures had the highest reoperation rates. No significant differences were observed in MIC, PASS, or TF between cohorts. Adjusted analysis showed lower odds of reoperation in 2020–2023 (OR 0.58, 95% CI 0.35–0.96, $p=0.03$).
Interpretation / Conclusion: Despite a substantial increase in meniscal repairs during ACLR, reoperation rates and short-term patient-reported outcomes remained unchanged. These findings support expanded indications for meniscal repair and reinforce the ongoing shift toward meniscal preservation.

90. Lateral Posterior Tibial Slope Differs in ACL-Reconstructed Patients vs Controls and Is Linked to Peak Knee Adduction Moment During Late Stance

Stephan Oehme[1,2], Matej Skrobot[2], Helena Schulz[3], Tobias Jung[1], Jürgen Reichenbach[3], Georg Duda[2], Martin Krämer[3], Nicholas Brisson[2]

1. Center for Musculoskeletal Surgery, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Charité - Universitätsmedizin Berlin, Germany 2. Julius Wolff Institute, Berlin Institute of Health at Charité - Universitätsmedizin Berlin, Germany 3. Institute of Diagnostic and Interventional Radiology, Jena University Hospital, Friedrich Schiller University Jena, Germany

Background: The posterior tibial slope (PTS) strongly influences knee biomechanics. The relationship between medial (MPTS) and lateral posterior tibial slope (LPTS), PTS asymmetry (ΔPTS), and dynamic knee moments during gait in ACLR patients remains unclear.
Aim: This study compared the MPTS, the LPTS, and ΔPTS between anterior cruciate ligament reconstructed (ACLR) patients and matched healthy controls, to explore sex-specific differences and to investigate associations between PTS morphology and sagittal and frontal plane knee joint moments during gait.
Materials and Methods: 21 ACLR patients (12 males,9 females; 34.1 ±8.2 years) and 22 matched healthy controls (14 males,8 females; 33.6 ±7.7 years) were included. Gait analysis was performed using three-dimensional motion capture (GRAIL, Motek Medical) to assess the peak knee flexion moment (KFM), early-and late-stance peak knee adduction moments (KAM1, KAM2) and peak knee extension moment (KEM). Tibial slope measurements (MPTS, LPTS, ΔPTS) were obtained from high-resolution 3T magnetic resonance imaging (MRI). Group comparisons and sex-stratified analyses were performed. Associations between PTS parameters and knee moments were examined across the combined cohort using univariable and covariate-adjusted multivariable linear regression.
Results: LPTS was significantly greater in ACLR patients compared with controls (6.6 ±3.2° vs. 3.9 ±3.0°, $p = 0.007$), whereas MPTS did not differ ($p = 0.706$). ΔPTS was lesser in ACLR patients compared with controls (0.0 ± 2.7° vs. −2.4 ±3.2°, $p = 0.011$). Sex-specific analyses showed that the significantly steeper LPTS difference was driven by females ($p = 0.025$), while smaller ΔPTS was observed predominantly only in males ($p = 0.038$). In multivariable regression, both LPTS ($\beta = 0.011$, $p = 0.030$) and ΔPTS ($\beta = 0.014$, $p = 0.008$) were associated with higher KAM2, after adjustment for group, sex, and BMI.
Interpretation / Conclusion: ACLR patients showed a steeper LPTS and smaller ΔPTS than matched controls, with sex-specific differences. Increased LPTS was independently associated with higher frontal plane knee loading during gait. These findings suggest that PTS morphology influences joint loading and may contribute to posttraumatic osteoarthritis after ACLR.

91. Microfracture Versus Arthroscopic Debridement for the Treatment of Symptomatic Cartilage Lesions of the Knee

Per-Henrik Randsborg[1,2], Aae Tommy Frøseth[3], Visnes Håvard[4], Birkenes Thomas[5], Benth Jurate[6], Lian Øystein[3], Hanvold Heidi[1], Årøen Asbjørn[1,2]
1. Department of Orthopaedic Surgery, Akershus University Hospital, Lørenskog, Norway 2. Institute of Clinical Medicine, Faculty of Medicine, University of Oslo, Oslo, Norway 3. Department of Orthopaedic Surgery, Kristiansund Hospital, Møre & Romsdal Hospital Trust, Kristiansund, Norway 4. Department of Orthopaedics, Sørlandet Hospital Kristiansand, Kristiansand, Norway. 5. Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Norway 6. Health Services Research Unit, Akershus University Hospital, Lørenskog, Norway

Background: Knee cartilage injuries can lead to significant functional limitations, pain, and diminished quality of life. Microfracture (MF) is the most common surgical procedure for smaller (\2 cm2) cartilage lesions of the knee. However, there is no established gold-standard surgical intervention.
Aim: To compare functional and patient-reported outcomes after MF and arthroscopic debridement (AD) for symptomatic, isolated femoral cartilage injuries\2 cm2 in patients aged 18 to 50 years.
Materials and Methods: A total of 65 patients were included, randomized to undergo either MF (n = 31) or AD (n = 34), and followed for 2 years. The primary outcome was the change in the Knee injury and Osteoarthritis Outcome Score (KOOS) Quality of Life subscore. Secondary outcomes included scores for the other KOOS subscales, Tegner activity scale, Lysholm score, and visual analog scale for pain.
Results: The mean age at the time of inclusion was 33.2 6 9.7 years. There were 44 (68%) male patients. The mean size of the lesion was 1.2 6 0.6 cm2. There was no statistically significant difference between the groups in the change in the KOOS Quality of Life subscore from baseline to 2 years (3.5 [95% CI, –10.0 to 16.9]; P = .61). There were 10 complications in 5 patients in the MF group and 2 complications in 2 patients in the AD group. According to a linear mixed model, there were no statistically significant differences between the groups for any of the secondary outcomes at any time point during the 2- year follow-up period.
Interpretation / Conclusion: MF was not superior to AD when treating femoral cartilage lesions of the knee\2 cm2.

SESSION 21: FREE PAPER SESSION – INFECTION

Thursday, 12 November 2026

13:30 – 14:15

Room: Blomster salen

Chairs:

Stučinskas Justinas
Department of Orthopedics, Medical Academy, Lithuanian University of Health Sciences, Lithuania

Karen Dyreborg
Department of Orthopaedics, Herlev and Gentofte Hospital, Denmark

92. Microbiological Profiles and Antibiotic Resistance Patterns in Shoulder, Hip and Knee Periprosthetic Joint Infections: A 5-Year Retrospective Single-Centre Cohort Study

Lucas Emil Jørgensen Østergaard[1,2], Thomas Greve[3], Jonas Eeg Madsen[4], Christen Ravn[5], Mats Bue[1,2,5]
1. Aarhus Denmark Microdialysis Research (ADMIRE), Orthopaedic Research Unit, Aarhus University Hospital, Denmark; 2. Department of Clinical Medicine, Aarhus University, Denmark; 3. Department of Clinical Microbiology, Aarhus University Hospital, Denmark; 4. Department of Health Informatics, Aarhus University Hospital, Denmark; 5. Department of Orthopaedic Surgery, Aarhus University Hospital, Denmark.

Background: Periprosthetic joint infection (PJI) is a serious complication of joint arthroplasty. Increasing antimicrobial resistance complicates its management and may compromise treatment effectiveness. Understanding the local microbiological aetiology and resistance patterns of PJI is essential for guiding empirical antimicrobial therapy.
Aim: This study aimed to characterise the pathogens causing PJI in the shoulder, hip, and knee, and to analyse their resistance profiles within a five-year single-centre cohort.
Materials and Methods: We retrospectively reviewed all microbiological samples collected from orthopaedic surgical procedures from June 2020 to March 2025. Microbiologically confirmed PJIs of the shoulder, hip, and knee were included and defined as: (i) at least two samples positive for the same microorganism with an identical susceptibility pattern from either tissue or tissue and synovial fluid; or (ii) one positive synovial fluid culture. An infection-episode was defined as 30 days from a PJI-related diagnostic or surgical procedure code.
Results: A total of 241 PJI episodes involving 280 isolated pathogens were identified in 201 patients. Monomicrobial infections accounted for 87% (n=210), while polymicrobial infections accounted for 13% (n=31). Staphylococcus aureus was the most frequently isolated pathogen (27%, n=75/280), followed by coagulase-negative staphylococci (26%, n=73/280). Gram-negative and anaerobic bacteria were also commonly isolated (11%, n=32/280). Conventional Danish empirical regimens, such as cefuroxime and cloxacillin, provided coverage for fewer than 70% of hip and knee PJIs and for approximately 85% of shoulder PJIs. Empirical regimens with over 90% coverage for hip and knee PJIs included vancomycin combined with meropenem, piperacillin–tazobactam, or ciprofloxacin. Vancomycin alone had similar coverage for shoulder PJIs.
Interpretation / Conclusion: Traditional Danish empirical antimicrobial regimens for PJI may provide inadequate coverage, especially for hip and knee PJIs. Our findings support tailoring empirical therapy for suspected PJI to the affected joint and local microbiological resistance patterns, rather than relying on standardised regimens, to improve antimicrobial effectiveness.

93. Bursa-Preserving Irrigation and Debridement Is a Safe and Effective Treatment for Traumatic Lacerations of the Olecranon and Prepatellar Bursa

Alexander Hildebrandt[1,2,3], Marcel Niemann [1], Paul Köhli [1,2,3], Dario Zocholl [4], Vera Jaecker [1], Ulrich Stöckle [1], Tobias Lindner [5], Florian N. Fleckenstein [3,6], Tobias Winkler [1,2,7], Tazio Maleitzke [1,2,8,9]

1. Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Center for Musculoskeletal Surgery, Berlin, Germany 2. Berlin Institute of Health at Charité – Universitätsmedizin Berlin, Julius Wolff Institute, Berlin, Germany, 3. Berlin Institute of Health at Charité – Universitätsmedizin Berlin, BIH Biomedical Innovation Academy, BIH Charité Clinician Scientist Program, Berlin, Germany 4. Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Institute of Biometry and Clinical Epidemiology, Berlin, Germany 5. Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Emergency and Acute Medicine, Berlin, Germany 6. Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Department of Radiology, Berlin, Germany 7. Berlin Institute of Health Center for Regenerative Therapies, Berlin Institute of Health at Charité – Universitätsmedizin Berlin, Berlin, Germany 8. Trauma Orthopaedic Research Copenhagen Hvidovre (TORCH), Department of Orthopaedic Surgery, Copenhagen University Hospital - Amager and Hvidovre, Hvidovre, Denmark 9. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark

Background: Traumatic lacerations of the olecranon and prepatellar bursa are frequently seen in emergency departments. Radical bursectomy (BE), despite having relevant complications rates, is yet still performed by some centers to prevent secondary bacterial bursitis. So far, no prospective study investigated whether bursa-preserving irrigation and debridement (I&D) is sufficient to prevent septic complications.
Aim: To investigate safety and efficacy of bursa-preserving I&D for the treatment of traumatic lacerations of the prepatellar and olecranon bursa.
Materials and Methods: We performed a prospective, mono-center, non-randomized, fixed-allocation clinical trial to compare, first, 40 patients with small (<1 cm) and large (>1 cm) traumatic bursa lacerations receiving I&D and, second, 40 patients receiving BE. The trial was prematurely terminated after 26 patients in the I&D group had completed the 6-month follow-up without septic complications, which was defined as the primary outcome. As Secondary outcomes, CRP, range of motion (ROM), numeric rating scale (NRS) pain, IKDC scores for prepatellar bursa lacerations, and qDASH scores for olecranon bursa lacerations were obtained. Wilson score 95% confidence intervals were calculated to estimate the upper limit of potential infection rates.
Results: None of the 26 patients that were included in the final analysis developed bacterial bursitis. At 30 days, mean plasma CRP levels were within the reference range. All but one patient returned to pre-injury ROM and had excellent NRS pain scores and function after 6 months (mean qDASH of 7.7 for OB, mean IKDC of 88.5 for PB). The calculated statistical upper limits of bacterial bursitis prevalence after I&D in a worst-case scenario were 16% for patients with lesions >1cm and 13% for all included patients.
Interpretation / Conclusion: We show first prospective data to promote minimally invasive bursa-preserving I&D as a safe and effective treatment for small and large traumatic prepatellar and olecranon bursa lacerations. Our data indicate that I&D should be considered as a standard treatment strategy for traumatic bursa lacerations, challenging the relevance of routine radical BE.

174. Should Antibiotic-Loaded Ceramic Bone Graft Substitutes Be Considered Sustained-Release Depots? A Critical Reanalysis of Gentamicin Release Data Informing Clinical Use

Catrine Berthelsen[1], Christoph Crocoll[2], Michal Poborsky[2], Louise K. Jensen[3], Jonas R. Henriksen[1], Anders E. Hansen[1], Mats Bue[4,5]

1. Section for Cell and Drug Technologies, Department of Health Technology, Technical University of Denmark, Kgs. Lyngby, Denmark 2. Department of Plant and Environmental Sciences, Faculty of Science, University of Copenhagen, Frederiksberg, Denmark 3. Department of Veterinary- and Animal Sciences, University of Copenhagen, Frederiksberg C, Denmark 4. Department of Clinical Medicine, Aarhus University, Aarhus N, Denmark 5. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus N, Denmark

Background: Antibiotic-loaded ceramic bone grafts (ACBGs) are widely assumed to provide prolonged local antimicrobial protection, with claimed concentrations above the minimum inhibitory concentration (MIC) for up to 28-42 days. These expectations strongly influence surgical planning and postoperative infection management. However, these claims are primarily derived from in vitro elution assays using simplified washout models, and their relevance to in vivo performance remains uncertain.

Aim: This study aimed to analyse and compare the in vivo and in vitro release and modelled characteristics of gentamicin from two commercially available ACBGs.

Materials and Methods: Gentamicin-loaded hydroxyapatite/calcium sulfate (HA–CS) and calcium sulfate (CS) composites were investigated using a murine implantation model and standardized in-vitro elution assays. Gentamicin content in recovered depot material and elution media was quantified by LC-MS/MS. Model calculations were applied to assess how assay design influences estimated time above MIC.

Results: Both ACBGs released >98% of incorporated gentamicin within 6 hours and >99% within 24 hours in vivo. In vitro assays supported early depot depletion, with concentration–time profiles beyond 48 hours governed by serial dilution rather than antibiotic release. Model calculations show that the apparent time above MIC in in vitro assays used to support claims of prolonged antibiotic activity largely reflects assay design, not sustained release, indicating that freely administered antibiotics could produce similar profiles.

Interpretation / Conclusion: Neither ACBG demonstrated measurable sustained release beyond an initial 24-hour burst phase. This may have important clinical implications, as expectations of prolonged local antimicrobial protection are not supported by the cumulative release data showing rapid antibiotic depletion. Distinguishing artefacts arising from in vitro assay design and analytical limitations from true sustained depot release is critical for surgical decision-making to avoid overestimating local antimicrobial coverage and unjustified clinical confidence in implant or tissue protection.

95. Evaluation of local vancomycin delivery via hip and knee spacers: a prospective comparison of 1 versus 2 gram vancomycin per batch cement

Floor C.A. Koelewijn[1], Michelle Mehciz[2,3], Jakob van Oldenrijk[1], Pieter K. Bos[1], Ewout S. Veltman[1], Birgit C.P. Koch[2,3]

1. Department of Orthopedics and Sports Medicine, Erasmus MC Rotterdam, The Netherlands 2. Department of Clinical Pharmacy, Erasmus MC Rotterdam, The Netherlands. 3. Rotterdam Clinical Pharmacometrics Group, Rotterdam, The Netherlands.

Background: Antibiotic-loaded spacers are widely used to deliver local antibiotics in two-stage revision for chronic prosthetic joint infection (PJI). Yet, it is unknown whether sufficient bone concentrations above the minimal inhibitory concentration (MIC) are reached.

Aim: This study aimed to quantify bone concentrations following vancomycin-loaded spacer implantation in the hip and knee.

Materials and Methods: Thirty patients with PJI of the hip or knee received a vancomycin-loaded spacer during two-stage revision. Vancomycin was manually added to cement loaded with gentamycin. In twenty-two consecutive patients 1g vancomycin per 40g cement batch was used (group A), while in eight patients 2g vancomycin was used (group B). Samples were analyzed using a validated ultra-performance liquid chromatography-tandem mass spectrometry (UPLC-MS/MS) assay. Bone concentrations were compared to the minimum inhibitory concentration (MIC) by applying a bone density of 1.9 kg/L.

Results: Mean time of spacer implantation was 65 days (range 25-114). In total, 71.4% of the knee patients exceeded their individual MIC, compared to 57.1% of the hip patients in group A. Increasing the dosage vancomycin from 1g to 2g did not seem to result in more patients achieving their individual MIC (knee: 72.7% vs. 66.7%, hip: 54.5% vs. 66.7%). In group A, thicker knee spacers yielded higher vancomycin concentrations (mean: 12.0 mg/L), followed by medium (mean: 5.2 mg/L) and thin spacers (mean: 2.8 mg/L). The same trend was seen in group B for one medium spacer (6.8 mg/L) and two thin (mean: 1.6 mg/L) spacers.

Interpretation / Conclusion: Our study showed that vancomycin-loaded spacers can achieve adequate bone concentrations even up to 16 weeks after implantation, potentially eliminating the need for systemic antibiotics. Larger bone cement volume in knee spacers, and thereby higher absolute vancomycin amounts, resulted in a higher proportion of patients achieving adequate target site concentrations compared to hip spacers. Contrary to our expectations, increasing the vancomycin dose from 1g to 2g did not seem to increase target tissue concentrations at reimplantation. Further research is needed to identify other factors explaining concentration variability.

96. Establishing the first Orthopaedic Infection Biobank in Denmark – FRAMED MSI Fragment Recognition of All Musculoskeletal Infections Providing Early Diagnostics

Thea Geil[1,2,3,4], Niels P. Jørgensen[1,2], Rikke Meyer[6], Rasmus A. Nielsen[2,5], Nina B Stærke[2,5], Ole H. Larsen[2,3], Josefine Slater[1,2,4], Mats Bue[1,2,4]

1. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus, Denmark; 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark; 3. Department of Molecular Medicine (MOMA), Aarhus University Hospital, Aarhus, Denmark; 4. Microdialysis Research (ADMIRE), Orthopaedic Research Laboratory, Aarhus University Hospital, Aarhus, Denmark; 5. Department of Infectious Diseases, Aarhus University Hospital, Aarhus, Denmark; 6. Interdisciplinary Nanoscience Center (iNANO), Aarhus University, Aarhus, Denmark.

Background: Musculoskeletal infections (MSI) constitute severe and intricate clinical entities associated with substantial morbidity and mortality, presenting significant diagnostic and therapeutic challenges. The timely diagnosis of these conditions remains difficult, and the escalating issue of antimicrobial resistance further complicates effective treatment strategies. High-quality frozen biospecimens serve as a critical resource for hypothesis-driven research, facilitating accelerated identification and development of novel diagnostic biomarkers.

Aim: FRAMED MSI aims to improve early recognition and understanding of MSIs through systematic collection and storage of biological samples and predefined clinical data.

Materials and Methods: All patients with suspected or confirmed MSI are enrolled and followed up for two years, with extended questionnaire-based follow-up for up to ten years. Blood samples, intraoperative tissue specimens, joint fluid, and microbiological isolates are collected and stored in a dedicated biobank. Predefined clinical data, including demographics, comorbidities, treatment strategies, imaging findings, microbiological results, clinical outcomes, and patient related outcome measures (PROMS), are collected. Planned analyses include routine laboratory testing, bacterial culture, immune profiling, and investigation of signalling molecules associated with infection and inflammation.

Results: We address the logistical challenges and barriers associated with establishing an MSI Biobank. Additionally, preliminary biological data and test results will be presented.

Interpretation / Conclusion: FRAMED MSI establishes a comprehensive resource to advance understanding of MSIs and strengthen research capacity, including antimicrobial resistance surveillance. By integrating clinical and tissue-specific phenotyping with long-term clinical follow-up, the study will support improved diagnostics, targeted treatment strategies, and preventive approaches. Additionally, immunosuppressive effects and other host-related factors on infection severity and outcomes will be investigated.

SESSION 22: FREE PAPER SESSION – PEDIATRICS

Thursday, 12 November 2026

13:30 – 14:15

Room: Ballon salen

Chairs:

Hilde W. van Kouswijk
Orthopedic Surgery, Leiden University Medical Center, Netherlands

Ole Rahbek
Department of Orthopaedics, Aarhus University Hospital, Denmark

97. AutoSAFE: AI-driven ultrasound imaging of distal forearm fractures in children

Ludger Tüshaus[1], Christoph Großbröhmer[2], Beke Larsen[1], Kathrin Kelly[1], Sven Mischkewitz[3], Mattias Heinrich[2]
1. Department of Paediatric Surgery, University Hospital Schleswig-Holstein, Campus Lübeck, Germany; 2. Institute of Medical Informatics, Universität of Lübeck, Germany; 3. ThinkSono GmbH, Potsdam, Germany.

Background: Forearm fractures are the most common fractures in childhood. Mobile ultrasound advancements now enable Point of Care Ultrasound (POCUS) in the emergency department. Compared to X-ray, ultrasound for fracture diagnosis is side-effect-free (no radiation), faster (shorter exam, no waiting for radiological diagnostics), and less painful. However, its diagnostic value is operator-dependent.
Aim: The aim of this study was to develop an AI-supported assistance system for ultrasound fracture diagnostics in children to overcome operator dependence by assisting with probe guidance and automated image interpretation.
Materials and Methods: As part of this prospective diagnostic study, one or both pediatric forearms underwent ultrasound using six longitudinal WristSAFE planes. Documented data included one still image per plane and a short video sequence captured before reaching the standard plane. Anatomical structures in these images were manually labeled for deep-learning algorithm training.
Results: 214 children were enrolled; 95 received a distal forearm fracture diagnosis. Several deep-learning algorithms were successfully trained to automatically recognize pediatric distal forearm/wrist anatomical structures and fractures (training 70%, validation & testing 15% each of the data). ResNet CNN achieved the best results, with an accuracy of 0.91 and an F1 score of 0.81 against groundtruth. When compared to a majority vote, its performance was even stronger, yielding an accuracy of 0.93 and an F1 score of 0.85. A separate CNN was trained to perform real-time segmentation of key anatomical structures during distal forearm sonography. The software uses this segmentation output to guide probe positioning for standardized image acquisition
Interpretation / Conclusion: The project delivers an AI-supported assistance system for ultrasound fracture diagnostics. It provides support in probe guidance, image interpretation, and documentation. Through near real-time, automated ultrasound image analysis, this AI system offers an improved, standardized examination procedure, enabling accurate structure recognition. The fracture detection workflow is thus standardized, accelerated, better documented, and more reproducible.

98. More than half of flexible intramedullary nails are removed on request in children following femoral shaft fractures. A prospective follow-up study of 53 children with minimum 5-year follow-up.

Nicolas Nietosvaara[1,2], Jussi Kosola[3,4], Yrjänä Nietosvaara[1,5], Ilkka Helenius[1,3], Topi Laaksonen[1]
1. Pediatric Orthopaedics and Traumatology, University of Helsinki and Helsinki New Children's Hospital, Helsinki, Finland 2. Department of Surgery, Päijät-Häme Central Hospital, Lahti, Finland. 3. Department of Orthopaedics and Traumatology, Helsinki University Hospital and University of Helsinki, Helsinki, Finland 4. Department of Orthopaedics and Traumatology, Kanta-Häme Central Hospital, Hämeenlinna, Finland. 5. University of Eastern Finland, Kuopio, Finland

Background: There is currently no consensus regarding the routine removal of flexible intramedullary nails (FIN) following the treatment of pediatric femoral shaft fractures.
Aim: We analyzed the frequency and primary causes of nail removal performed on request.
Materials and Methods: This prospective intervention study included 55 consecutive children (aged 3–14 years) with femoral shaft fractures treated with FIN between 2011 and 2018. Surgeons were instructed to leave the distal ends of the nails unbent above the distal femoral physis. The timing of and reasons for nail removal were recorded. For patients who retained their nails, the minimum follow-up period was five years.
Results: Nails were removed from 37 children (67%) due to pain, with no reported complications. The rate of hardware removal was significantly higher (2.6, 95% CI 1.347–5.021,) in patients with excessively long nails (distally and/or proximally) at 88% (21/24), compared to 52% (16/31) in children with correctly applied FIN. Furthermore, over-long nails were removed sooner (median 1.3 years, range 0.3–9.3) than properly placed nails (median 2.8 years, range 1–7.2). Distal nail ends were a median of 29 mm above the physis before removal (n=34/37) and 68 mm in those retaining their nails (n=8/18) at 4–13 years of follow-up.
Interpretation / Conclusion: Excessively long FIN hardware significantly increases the risk and speed of premature removal due to pain. To minimize symptoms, nails should be applied at the correct length. As children grow, nail ends may migrate substantially proximal to their original position in those who do not undergo hardware removal.

99. Multicenter Outcomes of Tibia–Fibula Cross-Union using the Paley Protocol for Congenital Pseudarthrosis of the Tibia

Ole Rahbek[1,2], Maria Tirta[1], Joachim Horn[3], Topi Laaksonen[4], Giedrius Bernotavičius[5], Huhnstock Stefan[3], Søren Kold[1]

1. Interdisciplinary Orthopaedics, Aalborg University Hospital, Aalborg, Denmark 2. Department of Orthopaedics, Aarhus University Hospital, Aarhus, Denmark 3. Section of Children's Orthopaedics and Reconstructive Surgery, Oslo University Hospital, Oslo, Norway 4. New Children's Hospital, HUS Helsinki University Hospital, Helsinki, Finland 5. Department of Children's Orthopedics and Traumatology, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania

Background: Congenital pseudarthrosis of the tibia (CPT) remains one of the most challenging conditions in pediatric orthopaedics, with persistent difficulty in achieving solid union and preventing refracture. In 2019, Paley introduced the tibia–fibula cross-union technique as a potential solution.
Aim: This multicenter case series examines the outcomes of children with CPT treated using the Paley protocol, representing the first multicenter evaluation of this approach.
Materials and Methods: We retrospectively analyzed children with CPT treated with the Paley protocol at four Nordic pediatric orthopaedic centers. Surgical management included resection of fibrous hamartoma, tibia–fibula cross-union, autologous iliac bone grafting. Outcomes assessed were radiographic union, refracture rate, and postoperative complications.
Results: Eighteen patients (mean age 5.7 years; SD 3.7; range 1.8–12.9) were included, with a follow-up of 3.6 years (SD 2.2; range 0.3–8.43). There were 15 males and 3 females. According to the Paley classification, 1 patient was type 1, 2 patients type 2B. 9 patients type 3, 2 patients type 4A, and 4 patients type 4B. Fourteen patients had received bisphosphonate therapy before surgery, whereas 4 had not. After surgery, bisphosphonate use was evenly divided (9 yes, 9 no). Bone morphogenetic protein (BMP) was administered intraoperatively in half of the cases. Radiographic union was ultimately achieved in all patients, with 17 of 18 (94.4%) achieving union after the first surgery. Twelve patients (67%) experienced no complications, while six developed complications; two sustained refractures that required additional surgical intervention.
Interpretation / Conclusion: Tibia–fibula cross-union combined with biologic augmentation provided consistent union and minimized refracture in this series. These findings suggest that cross-union may serve as an effective adjunct to conventional approaches and has the potential to shift the treatment paradigm for this complex and difficult-to-manage disorder.

100. Retrograde Extramedullary Limb Lengthening of the Femur in Children: Surgical Technique and Early Results

Christopher Iobst[1], Anirejuoritse Bafor[1], Mubashir Wani[1], Danielle Hatfield[1]
1. Nationwide Children's Hospital

Background: Internal lengthening nails improve patient comfort with distraction osteogenesis compared with external fixation, but intramedullary placement may be unsafe or not feasible in skeletally immature patients. Extramedullary limb lengthening (EMLL), in which a lengthening nail is placed in a submuscular plane along the lateral femur, provides an alternative method to external fixation.
Aim: We describe the retrograde femoral EMLL technique and report our short and intermediate term clinical outcomes.
Materials and Methods: After obtaining IRB approval, we performed a retrospective review of consecutive patients undergoing femoral lengthening with a retrograde extramedullary lengthening nail. Recorded variables included preoperative limb length discrepancy, length gained, distraction parameters, bone healing index, and complications.
Results: 23 femoral lengthenings were performed in 20 patients including one bilateral and two sequential lengthenings. The mean age was 7 years and the most common diagnoses were fibular hemimelia (39%) and congenital femoral deficiency (26%). All segments were treated with a PRECICE nail using two proximal and two distal interlocking screws.. Mean length gained was 4.0 cm (13% of femoral length). Mean bone healing index was 32 days/cm. Five complications occurred: 4 symptomatic distal bursae (one draining) and one proximal interlocking screw fracture. There were no delayed unions or non-unions, no regenerate deformation, no regenerate fractures during or after treatment, and no hip or knee contractures requiring intervention beyond standard therapy and bracing. There were no unplanned surgeries during the lengthening course and no requirement for supplemental fixation either at the index procedure or following nail removal.
Interpretation / Conclusion: In conclusion, retrograde femoral extramedullary lengthening with a magnetically controlled nail appears safe, predictable, and well tolerated in pediatric patients, allowing avoidance of external fixation without routine supplemental hardware. While it does not eliminate risks inherent to limb lengthening, it provides a viable alternative for appropriately selected pediatric femoral lengthening candidates.

101. Cosmetic stature lengthening in Scandinavia: a cross-sectional survey of limb reconstruction surgeons at the LLRS Nordic meeting 2026

Stefan Huhnstock[1], Thilini Gamage[1], Joachim Horn[1,2], Limb Lengthening and Reconstruction Society of the Nordic and Baltic Countries
1. Section for Children's Orthopedics and Reconstructive Surgery, Division of Orthopaedic Surgery, Oslo University Hospital, Norway 2. Faculty of Medicine, University of Oslo, Norway

Background: No Scandinavian data exist on cosmetic stature lengthening, however, demand appears to be increasing, particularly in private and overseas settings, with complications potentially presenting to public healthcare systems.
Aim: To describe practice patterns, patient inquiries, complication management, and expert opinions regarding cosmetic stature lengthening among Scandinavian limb reconstruction surgeons.
Materials and Methods: An anonymous cross-sectional survey was conducted during a research session at the Limb Lengthening and Reconstruction Society, Nordic/Baltic meeting, Oslo, 5–6 February 2026. Of 33 Scandinavian surgeons registered, 22 responded. The 30-item questionnaire covered five domains: surgeon characteristics, patient requests, performed cosmetic lengthening, complications, and attitudes (Likert 1–5).
Results: Among respondents (n=22; Denmark 2, Finland 10, Norway 7, Sweden 3), 9/22 (41%) had received requests for cosmetic stature lengthening within the past 2 years. None approved these procedures at their unit or referred patients within Scandinavia; however, 7/9 (78%) provided counselling before declining. Only one surgeon reported performing cosmetic femoral lengthening (1–2 cases in the past 2 years, using an internal lengthening nail with planned lengthening of 6–8 cm). Seven surgeons reported treating complications following cosmetic stature lengthening performed abroad within the past 5 years (six with 1–2 cases; one >5); revision surgery was required in five cases, and permanent sequelae were reported by four surgeons. Most respondents considered current evidence on long-term psychosocial benefit insufficient to justify the medical risks of lengthening (63% disagreed, 37% neutral, 0% agreed; n=41). The majority agreed that Nordic public health services should not fund cosmetic stature lengthening (73% agreed; n=22) and 64% selected 'never justifiable' as an indication in otherwise healthy individuals.
Interpretation / Conclusion: First survey of Scandinavian limb reconstruction surgeons indicates limited acceptance of cosmetic stature lengthening, alongside with a notable burden of complications from procedures performed abroad. This findings highlight the need for regional guidance and policy development.

SESSION 23: FREE PAPER SESSION – ONCOLOGY

Thursday, 12 November 2026

13:30 – 14:15

Room: Arkaden 4+5

Chairs:

Minna Laitinen
Department of Orthopaedics, Helsinki University Hospital, Helsinki, Finland

Thomas Baad-Hansen
Department of Orthopaedic Oncology, Aarhus University Hospital, Denmark

51. Synovial Sarcoma – an epidemiological study of a national cohort (2003–2018)

Caroline Kastenskov[1], Afrim Iljazi[1], Michael Mørk Petersen[1], Michala Skovlund Sørensen[1,2]
1. Musculoskeletal tumor section, department of orthopedics, Rigshospitalet 2. department of orthopedics and Centre for Evidence-Based Orthopaedics, Department of Orthopaedic Surgery, Zealand University Hospital Køge, Køge, Denmark

Background: Synovial sarcoma (SS) is a rare and aggressive type of soft tissue sarcoma (STS) categorized as a “tumor of uncertain differentiation” as per the World Health Organization. SS has been reported to account for 4.5-10% of all STS. The evidence underlying treatment efficacy remains limited and partly inconsistent, particularly with respect to chemotherapy. The lack of large, population-based studies further limits the development of a definitive, evidence-based treatment protocol for SS.
Aim: To describe the epidemiology, clinicopathological characteristics, treatment patterns, and overall survival rates of adult patients diagnosed with SS in Denmark between 2003 and 2018.
Materials and Methods: The cohort was identified by SNOMED codes for SS in the Danish Pathology Registry for adults (>18 yrs) with biopsy verified SS. Clinical variables and outcomes were identified from the Danish Sarcoma Database, ensuring a complete national cohort with no loss to inclusion nor follow-up. Kaplan Meier analysis was used to address overall patient survival and Aalen-Johanson estimate was used to address univariate risk of local recurrence and risk of metastasis
Results: We identified 62 patients, of which 55% were female (n=34). The mean age at diagnosis was 43 years (range: 18-93). 1-, 5- and 10-year overall survival (OS) probabilities were 94% (95% CI: 88-100%), 55% (95% CI: 44–69%), and 45% (95% CI: 34–59%), respectively. In univariate analysis, tumor size (>5 cm), no surgery and metastasis at time of diagnose were poor prognostic factors for survival. No difference in OS was seen for age (>40 yrs) or surgical margin. 30% of patients experienced metastasis during follow-up. The estimated 1-, 5-, and 10-year cumulative incidences of metastases were 22% (95% CI: 11–34%), 41% (95% CI: 27–55%), and 47% (95% CI: 33–61%), respectively. Only nine patients experienced local recurrence with no difference in risk between patients having adjuvant radiotherapy vs. none.
Interpretation / Conclusion: SS is an aggressive disease with low incidence, but high risk of metastasis and poor survival.

103. Wound complications in soft tissue sarcoma patients treated with preoperative versus postoperative radiotherapy, a retrospective study.

Line Baadsmand Ascanius[1], Ninna Aggerholm-Pedersen[2], Hanne Krogh Rose[2], Thomas Baad-Hansen[1], Michael Melchior Bendtsen[1]
1. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus, Denmark; 2. Department of Oncology, Aarhus University Hospital, Aarhus, Denmark.

Background: Soft tissue sarcomas (STS) are commonly treated with tumor resection and radiotherapy. In 2022 the Sarcoma Center at Aarhus University Hospital (AUH), Denmark, changed clinical practice from primarily treating with postoperative radiotherapy (PostRT) to preoperative radiotherapy (PreRT). Studies have found an association between receiving PreRT and developing wound complications.
Aim: The aim of this retrospective study was to determine, whether patients who received PreRT had a higher incidence of wound complications than patients who received PostRT. Furthermore, it evaluated the impact of radiotherapy timing on local recurrence, metastases, fibrosis and mortality.
Materials and Methods: The study included 50 patients treated for STS at AUH between February 2020 and October 2025. 25 patients who received PreRT were included and matched on tumor characteristics with 25 PostRT patients. Patient and tumor characteristics were assessed for each radiotherapy group. Wound complications were evaluated for four months after surgery with the Clavien-Dindo and major wound complication classifications. The incidence of local recurrence, metastases, mortality and fibrosis was evaluated for the full follow-up period.
Results: Within four months after surgery 44% of PreRT patients and 20% of PostRT patients had wound complications. 12% of PreRT patients had long treatments with conservative care for wound complications, while none of the PostRT patients required this intervention. Conversely, 24% of the PostRT patients developed fibrosis, while none of the PreRT patients had this late complication.
Interpretation / Conclusion: PreRT patients had more wound complications within four months postoperatively, however PostRT patients had more late complications in the form of fibrosis. These findings suggest potential differences between treatment strategies without indicating clear superiority of either approach.

104. Global Practice Patterns In Pelvic Reconstruction After Bone Tumour Resection: A Multicentre Survey On The Use And Complications Of Pedestal Cups And Custom-Made Prostheses

Minna Laitinen[1,2,3,4,5], Matthew T Houdek[2], Richard Boyle[3], Kurisunkal Vineet J[4], Morris Guy V[4], Ruggieri Pietro[5], Jeys Lee M[4]

1. Helsinki University Hospital, Helsinki, Finland 2. Mayo Clinic, Rochester, United States 3. Royal Prince Alfred Hospital, Camperdown, Australia 4. Royal Orthopaedic Hospital, Birmingham, United Kingdom 5. University of Padova, Padova, Italy

Background: Pelvic reconstruction following tumour resection remains one of the most challenging areas of orthopaedic oncology, with high complication and revision rates.
Aim: This international survey aimed to evaluate global practice patterns, implant choice, and short-term outcomes—specifically return to theatre (RTT)—for pedestal cups and custom-made pelvic prostheses.
Materials and Methods: A web-based survey was distributed to 127 orthopaedic oncology centres following the BOOM meetings. The survey captured reconstructive techniques, implant indications, use of pelvic ring reconstruction, and reported complications over the previous five years. In addition to structured multiple-choice questions, open-ended questions were included to explore surgeons' rationale for implant selection, changes in practice, and barriers to using custom-made implants. Responses were collected anonymously but linked to centres to avoid duplication.
Results: A total of 74 centres across 35 countries responded, reporting 1,018 reconstructions: 54% for primary bone tumours, 20% for pelvic metastases, and 26% for complex revision arthroplasty. Pedestal cups had RTT rates of 41% after primary tumour surgery, 25% after metastasis reconstruction, and 19% after revision arthroplasty ($p = 0.04$). Custom implants without pelvic ring reconstruction showed RTT rates of 50%, 11%, and 30% respectively ($p = 0.022$), while ring-reconstructing custom prostheses showed RTT rates of 38%, 15%, and 38% ($p < 0.001$). Open-ended responses revealed declining use of pedestal cups, increasing but selective adoption of custom-made implants, and strong concern about infection, mechanical failure, and cost. Many centres expressed a desire to use custom implants but cited financial and regulatory barriers.
Interpretation / Conclusion: Global practice in pelvic reconstruction remains heterogeneous. Pedestal cups are in decline, while custom implants are increasingly used in carefully selected patients, although access is limited by cost and production delays. Higher institutional volume appears associated with lower complication rates, supporting centralisation of complex pelvic reconstruction

105. Megaprosthetic reconstruction of skeletal defects of the lower extremity

David Bergh[1], Panagiotis Tsagkozis[1,2]
1. Department of Orthopaedic surgery, Karolinska University Hospital, Stockholm, Sweden. 2. Department of Molecular Medicine and Surgery, Karolinska Institutet, Stockholm, Sweden.

Background: Megaprostheses are increasingly used for reconstructions of large skeletal defects following bone tumor resection, failed arthroplasty and severe fractures. However, long-term follow-up studies on megaprosthetic complications remain limited and require further investigation.
Aim: The aim was to evaluate implant survival, failure patterns, and the risk of secondary amputation following reconstruction of skeletal defects of the lower extremity in patients treated with the cemented Megasystem-C megaprosthesis (Waldemar Link GmbH).
Materials and Methods: This retrospective single-center study included 157 consecutive patients treated with a cemented Megasystem-C prosthesis at Karolinska University Hospital between 2016 and 2025. Complications were classified according to the Henderson classification. With death as competing event, cumulative incidence functions estimated implant failure risk.
Results: Thirty-six (23%) implants developed a complication according to Henderson. The most common failure modes were soft-tissue failure (n=12), infections not amenable to DAIR (n=9) and aseptic loosening (n=8). In total, infection occurred in 23 patients (15%). Proximal femoral implants showed the lowest cumulative incidence of failure (6% at 5 years), whereas distal femoral reconstructions showed the highest cumulative incidence of failure (30% at 5 years), with aseptic loosening occurring in 10% of all distal implants. Overall incidence of implant failure, excluding tumor progression, was 5% at 1 year and 19% at 5 years. Biological complications, such as infections, were associated with an increased risk of secondary amputations.
Interpretation / Conclusion: Reconstructions with the cemented Megasystem-C prosthetic system demonstrated good overall short-term survival and good long-term survival in proximal femoral reconstructions, but inferior survival in distal femoral reconstructions. Infection and aseptic loosening remain major challenges, and prosthetic infection was associated with an increased risk of amputation.

106. Infection after endoprosthetic reconstruction in orthopedic oncologic conditions: A multicenter Scandinavian cohort study.

Yusuf Mustaf Ahmed Ibrahim[1], Afrim Iljazi[1], Olga Zaikova[2], Michala Skovlund Sørensen[1], Rikke Maria Lanng[3], Thomas Baad-Hansen[3], Michael Mørk Petersen[1], Christina Enciso Holm[1]
1. The Musculoskeletal Tumor Section, The Department of Orthopedic Surgery, Rigshospitalet, University of Copenhagen, Denmark; 2. Department of Oncological Surgery, Norwegian Radium Hospital, Oslo, Norway; 3. Department of Orthopedic Surgery, Tumor Section, Aarhus University Hospital, Denmark

Background: Limb-sparing surgery (LSS) with resection and endoprosthetic reconstruction of oncologic bone lesions is considered highly susceptible to periprosthetic infections (PPI). Large multicenter studies with long-term follow-up describing risk of infection and predisposing factors are sparse.
Aim: The aim of this study was to 1) determine the long-term cumulative incidence of PPI and 2) describe predisposing factors for PPI in a large Scandinavian cohort with very long-term follow-up.
Materials and Methods: This retrospective cohort study included 1,337 endoprosthetic reconstructions performed in 1,295 patients (F/M=665/630), mean age 58 years (range 6-93 years) due to primary (n=401) or metastatic bone lesions (n=936) between 2000 (January 1) and 2020 (December 31). All patients were treated at one of the two tertiary referral centers for orthopedic oncology in Denmark, or at Oslo University Hospital, Norway. Patients were followed until death or end of study (31 December 2025), ensuring a minimum follow-up of 5 years. Median follow-up time was 13.7 years (range: 0-24.8 years). Cumulative incidence of PPI was estimated using competing risk analysis, with amputation unrelated to infection and death as competing events.
Results: The cumulative incidence of PPI for the entire cohort at 6-months, 5-years, and 20-years was 4% (95%CI: 3-5), 7% (95%CI: 6-9), and 8% (95%CI: 6-9), respectively. The highest risks of PPI were at proximal tibia and pelvic reconstructions of primary bone lesions. Proximal tibia: The cumulative incidence of PPI at 6-months, 2-years, and 5-years was 13% (95%CI: 6-21), 18% (95%CI: 10-27), and 21% (95%CI: 12-30), respectively. Pelvis: The cumulative incidence of PPI at 6-months and 5- years was 15% (95%CI: 4-26) and 20% (95%CI: 7- 32), respectively.
Interpretation / Conclusion: This multicenter Scandinavian cohort study with long-term follow-up demonstrates an increasing cumulative incidence of PPI over time. Surgical site and histological diagnoses predispose varying risks of infection with proximal tibia and pelvic reconstructions representing the highest risks, particularly in reconstruction of primary malignancies.

SESSION 24: FREE PAPER SESSION – SPINE

Thursday, 12 November 2026

13:30 – 14:15

Room: Arkaden 6

Chairs:

Casper Rokkjær Dragsted
Spine Unit, Department of Orthopaedic Surgery, Copenhagen University Hospital – Rigshospitalet, Copenhagen, Denmark

Paul Gerdhem
Department of Orthopaedics and Hand Surgery, Uppsala University Hospital, Uppsala, Sweden

107. Dynamic assessment of cefepime/enmetazobactam concentrations in medulla spinalis, the subarachnoid and epidural space: an experimental porcine study

Maria Bech Damsgaard Nielsen[1,2], Mads Kristian Duborg Mikkelsen[1,2], Hans Christian Rasmussen[1,2], Magnus Andreas Hvistendahl[1,2], Josefine Slater[1,2], Kresten Wendell Rickers[2], Li Haisheng[2], Christoph Crocoll[3], Michal Poborsky[3], Nis Pedersen Jørgensen[1,2,4], Alex Soriano[5], Maiken Stilling[1,2], Mats Bue[1,2]
1. Department of Clinical Medicine, Aarhus University, Aarhus N, Denmark; 2. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus N, Denmark; 3. Department of Plant and Environmental Sciences, Faculty of Science, University of Copenhagen, Frederiksberg, Denmark; 4. Department of Infectious Diseases, Aarhus University Hospital, Denmark; 5. Department of Infectious Diseases, Hospital Clínic of Barcelona, University of Barcelona, Barcelona, Spain

Background: Central nervous system (CNS) infections caused by ESBL-producing Enterobacterales are associated with high morbidity and risk of therapeutic failure. While several β-lactam/β-lactamase inhibitor combinations have shown encouraging activity against gram-negative CNS infections, pharmacokinetic data for cefepime/enmetazobactam from the CNS have not previously been described.
Aim: To quantify the unbound concentrations of cefepime and enmetazobactam in CNS compartments following intravenous administration.
Materials and Methods: Microdialysis catheters were placed in three CNS compartments: The medulla spinalis, the subarachnoid space, and the epidural space. Sixteen pigs were randomised to receive either a short-term infusion of cefepime/enmetazobactam (2 g/0.5 g over 2 h) or continuous infusion (initial dosage of 1 g/0.5 g administered over 15 min followed by 1 g/0.25 g over 7 h and 45 min) during three 8 h dosing intervals. Samples were collected during the first (0-8 h) and third (16-24 h) dosing interval and quantified by LC–MS/MS. Pharmacokinetic target attainment was evaluated as the percentage of the dosing interval during which concentrations exceeded clinically relevant targets for Enterobacterales; 4 mg/L for Cefepime (T>MIC4) and 2 mg/L for enmetazobactam (T>Cthreshold2).
Results: Cefepime: In all compartments, regardless of administration, the mean T>MIC4 ranged from 98-100% and 97-100% for the first and third dosing interval, respectively. Enmetazobactam: In the first dosing interval, the mean T>Cthreshold2 ranged from 82-99% (short-term infusion) and 96-100% (continuous infusion) across all compartments. In the third dosing interval, the mean T>Cthreshold2 ranged from 85-100% (short-term infusion), and from 89-100% (continuous infusion) across all compartments.
Interpretation / Conclusion: This study presents the first dynamic pharmacokinetic data on cefepime/enmetazobactam penetration into the CNS. High T>MIC and T>Cthreshold target attainments were achieved in the medulla spinalis, the subarachnoid space and the epidural space, irrespective of mode of administration. These novel findings offer a quantitative foundation for optimising dosing strategies for cefepime/enmetazobactam in the management of CNS infections.

108. When Diagnostic Workup Is Complex: Patient-Reported Outcomes After Lumbar Surgery With and Without a Prior Selective Nerve Root Block

Torbjørn Shields Thomsen[1], Troels Stisen Ruthner[1], Sarah Ali Al-Halafi[1], Christine Harboe Christiansen[1], Emran Rona[1], Rune Dueholm Beck[1,2], Dennis Winge Hallager[1,2]
1. Department of Orthopedic Surgery, Zealand University Hospital, Køge, Denmark 2. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark

Background: Decision-making in lumbar spine surgery is not always straightforward: Symptoms, imaging, and clinical findings may not align. Selective nerve root blocks (SNRBs) are sometimes used in the diagnostic workup, but their prognostic value for postoperative outcomes remains uncertain.
Aim: To compare 1-year patient-reported outcomes after lumbar nerve root decompression in patients with a good response to preoperative SNRB and patients undergoing surgery without prior SNRB.
Materials and Methods: The cases included patients who had received a diagnostic SNRB with documented effect and subsequently underwent surgery at the same level. Adult patients (≥18 years) who underwent a lumbar SNRB between 1 January 2018 and 31 May 2024 were retrospectively identified from electronic health records at our institution. Controls were patients undergoing nerve root decompression without prior SNRB, identified in the DaneSpine registry. The primary outcome was Oswestry Disability Index (ODI) adjusted mean difference at 12 months modelled using a multivariate linear regression adjusted for age, sex, BMI, symptom duration, prior surgery, and baseline ODI. MCID was 10 points. The secondary outcome was patient satisfaction at 12 months, compared using Pearson's chi-squared test. The protocol was approved by the institutional review board and registered at https://osf.io/v2q8k.
Results: 57 cases and 216 controls were identified. More patients in the case group had previous spine surgery; other baseline characteristics were comparable between groups. At the 12-month follow-up, controls had improved ODI from a mean of 44 (SD 19) preoperatively to 32 (SD 17), and cases improved from 44 (17) to 31 (SD 20). Adjusted mean difference in ODI at 12 months was –2 (95%CI –7;3), p = 0.49. The proportion of patients satisfied with treatment was 44% in both the case and control groups; the difference was 0.2% (95% CI –15%; 15%), p>0.9.
Interpretation / Conclusion: When surgeons include an SNRB in the workup of lumbar radiculopathy, this study supports that patients who respond well can be informed that the expected improvement from surgery is comparable to that of patients with a more straightforward indication for surgery.

109. Preoperative Paraspinal Muscle Quality and Functional Outcome After Lumbar Spinal Stenosis Surgery

Peter Muhareb Udby[1], Hallager Dennis[2], Iljazi Afrim[1], Andersen Mikkel Østerheden[3], Carreon Leah[3]
1. Department of Orthopedic Surgery, Spine Unit, Copenhagen University Hospital, Rigshospitalet, Denmark 2. Department of Orthopedic Surgery, Spine Unit, Zealand University Hospital, Koege, Denmark 3. Spine Surgery and Research, Spine Center of Southern Denmark, Kolding Hospital, Denmark

Background: Outcomes after surgery for lumbar spinal stenosis (LSS) vary substantially. Paraspinal muscle quality may reflect functional reserve, but its prognostic value in LSS surgery remains incompletely defined.
Aim: To assess whether preoperative multifidus muscle fatty infiltration and psoas muscle size are associated with functional outcomes after LSS surgery.
Materials and Methods: Patients undergoing surgery for LSS were identified from the Danish National Spine Registry. Preoperative MRI was used to grade multifidus fatty infiltration using the Goutallier classification system and to measure psoas muscle index. The primary outcome was Oswestry Disability Index (ODI) at two-year follow-up. Secondary outcomes included change in ODI from baseline (ΔODI) and achievement of a minimal clinically important difference (MCID; ΔODI ≥12).
Results: A total of 344 patients were included. Psoas muscle index was not associated with ODI at two years ($p = 0.163$), ΔODI ($p = 0.134$), or MCID responder status ($p = 0.211$). In contrast, increasing Goutallier grade demonstrated a significant linear association with worse ODI at two years ($p = 0.021$), less improvement in ΔODI ($p = 0.003$), and reduced odds of achieving MCID (OR 0.45 per grade; $p = 0.024$).
Interpretation / Conclusion: Preoperative multifidus muscle fatty infiltration is associated with worse long-term functional outcome and a lower likelihood of clinically meaningful improvement after surgery for lumbar spinal stenosis in a dose–response manner, whereas psoas muscle index is not predictive of outcome. Assessment of paraspinal muscle quality on routine MRI may aid in preoperative risk stratification and patient counseling.

110. Long-term outcomes 5-15 years after posterior spinal fusion with segmental pedicle screw instrumentation for adolescent idiopathic scoliosis: A retrospective cohort study

Ida Bromell Kindberg[1,2], Efe Levent Aras[2,3], Jon Kaspersen[2,3], Sasa Randelovics[2,3], Simon Toftegaard Skov[2,3], Søren Eiskjær[2,3]
1. Faculty of Medicine, Aalborg University, Aalborg, Denmark 2. Department of Clinical Medicine, Aalborg University, Aalborg, Denmark 3. Department of Orthopaedic Surgery, Spine Section, Aalborg University Hospital, Aalborg, Denmark

Background: The long-term outcomes after adolescent idiopathic scoliosis (AIS) surgery using segmental pedicle screw constructs are sparsely reported. This limits the ability to counsel patients and families regarding expected long-term prognosis.
Aim: The primary aim was to evaluate the long-term radiographic and patient reported outcome measures (PROM) outcomes after posterior spinal fusion for AIS and to identify predictors of patient satisfaction.
Materials and Methods: This retrospective single center cohort evaluated both PROMs and radiological variables 5-15 years after AIS surgery. Consecutive patients aged 11–21 years who underwent posterior spinal fusion (2009-2020) were identified from the hospital registry. Long-term PROMs SRS-22 and EQ-5D-5L were collected electronically. Preoperative PROMs were retrieved from the national spine registry. Radiographic parameters were assessed preoperatively, postoperatively, and at final follow-up. Multivariable logistic regression identified predictors of long-term satisfaction.
Results: Of 148 eligible patients, 120 (81%) completed long-term PROM and 112 (76%) attended radiographic follow-up (median 9 years). The complication rate was 12.5%. Mean major curve correction was 78% postoperatively, with approximately 4° loss at final follow-up. SRS-22 self-image, total scores, and EQ-5D utility scores improved compared with preoperative values. At long-term follow-up, 84% were satisfied or very satisfied with surgical results. Socioeconomic variables, Lenke type 2 curves, and number of instrumented levels were independent predictors of satisfaction (AUC 0.85).
Interpretation / Conclusion: Posterior spinal fusion with segmental pedicle screw instrumentation for AIS provides durable radiographic correction and sustained improvement in patient-reported outcomes at up to 15 years. Long-term satisfaction is influenced not only by surgical factors but also by socioeconomic variables.

111. Selective thoracic fusion provides spontaneous secondary curve correction in adolescent idiopathic scoliosis patients with Lenke 1–2 curves

Lærke C. Ragborg[1], Martin Heegaard [1], Jason Cheung [2], Martin Gehrchen [1], Benny Dahl [1], Søren Ohrt-Nissen [1]
1. Spine Unit, Department of Orthopedic Surgery, Rigshospitalet, Denmark 2. Department of Orthopaedics and Traumatology, The University of Hong Kong, Hong Kong SAR.

Background: Posterior pedicle screw instrumentation is the standard surgical treatment for thoracic adolescent idiopathic scoliosis (AIS). Selective thoracic fusion (STF) aims to preserve lumbar mobility and reduce the risk of long-term pain. However, inadequate selection of fusion levels may result in residual deformity, potentially affecting function and cosmetic outcomes. Evidence regarding spontaneous correction of the secondary, non-instrumented curve following STF in Lenke 1 and 2 patients remains limited.
Aim: To evaluate the extent of spontaneous secondary curve correction following STF in patients with Lenke 1 and 2 AIS.
Materials and Methods: In this retrospective dual-center study, patients with AIS Lenke 1 and 2 curves who underwent STF between 2006 and 2024 were included. Major and secondary Cobb angles were measured preoperatively, immediately postoperatively, and at two-year follow-up. Preoperative fulcrum bending (FB) radiographs were obtained to assess secondary curve flexibility. Changes in the secondary, non-instrumented curve were analyzed across time points. Correlation between FB measurements and postoperative secondary curve magnitude was assessed using Pearson's correlation coefficient.
Results: A total of 478 patients were included (mean age 15.3 ± 2.5 years; 84% female), with a mean preoperative major Cobb angle of 59° and secondary Cobb angle of 34°. Lenke 1 curves accounted for 90% of cases. A significant reduction in the secondary, non-instrumented curve was observed postoperatively (mean reduction 17 ± 9°, $p < 0.001$), corresponding to a 50% decrease. This correction was maintained at two-year follow-up (mean 18 ± 9°, $p < 0.05$ vs. preoperative values). A moderate positive correlation was found between preoperative FB measurements and postoperative secondary curve magnitude ($r = 0.32$, $p < 0.001$).
Interpretation / Conclusion: Selective thoracic fusion results in significant and sustained spontaneous correction of the secondary curve in Lenke 1 and 2 AIS. These findings support the use of STF to preserve lumbar mobility while achieving satisfactory deformity correction.

SESSION 25: FREE PAPER SESSION – FOOT/ANKLE

Thursday, 12 November 2026

13:30 – 14:15

Room: Arkaden 7

Chairs:

Rasmus Cleeman
Department of Orthopaedics, Copenhagen University Hospital Bispebjerg, Denmark

Torben Stryhn
Foot and Ankle Section, Department of Orthopaedic Surgery, Odense University Hospital, Odense, Denmark

112. Inforatio technique as a novel, low-cost adjunctive treatment for diabetic foot ulcers: a randomised clinical trial

Sahar Moeini[1,2], Hans Gottlieb[3,4], Tue Smith Jørgensen[1], Malene Ringholm Bæk Larsen[1], Stig Brorson[1,4]
1. Department of Orthopaedic Surgery, Zealand University Hospital Koge, Lykkebaekvej 1, 4600 Koge, Denmark 2. Department of Orthopaedic Surgery, Nykobing Falster Hospital, Fjordvej 15, 4800 Nykobing Falster, Denmark 3. Department of Orthopaedic Surgery, Herlev Hospital, Borgmester Ib Juuls Vej 1, 2730 Herlev, Denmark 4. Department of Clinical Medicine, University of Copenhagen

Background: Diabetic foot ulcers are common and burdensome complications of diabetes, increasing in prevalence worldwide. There is an urgent need for novel adjunctive treatments that are both affordable and feasible to implement in high- and low-income settings.
Aim: To assess whether the inforatio technique, a novel, low-cost procedure, promotes healing of diabetic foot ulcers.
Materials and Methods: This multicentre, observer-masked, randomised clinical trial was conducted at specialised wound care clinics in four Danish hospitals. Patients with non-infected, superficial diabetic foot ulcers were randomly assigned (1:1) to receive either the inforatio technique every 3 weeks for 12 weeks with standard care or standard care alone. The Inforatio technique involves making small incisions in the wound bed using a biopsy punch, which costs approximately €2.5. The procedure requires 1–5 minutes to complete, can be performed at the bedside, and is incorporated into routine wound care sessions. The primary outcome was the proportion of ulcers achieving complete healing within 20 weeks.
Results: Between March 10, 2022, and Aug 14, 2024, 100 eligible patients were randomly assigned to the inforatio group (n=49) or standard care (n=51). The mean age was 64.4 years (SD 11.4), 85 were men, and 83 had type 2 diabetes. Within 20 weeks, complete healing occurred in 24 patients in the inforatio group and 14 in the standard care group (adjusted odds ratio 3.01, 95% CI 1.20–7.58; p=0.02). Index ulcer-related adverse events (wound expansion, infection, osteomyelitis, surgical revision, exposure of bone, joint or tendon, hospitalisation, or amputation) occurred in 16 patients in the inforatio group versus 30 in the standard care group (risk ratio 0.56, 95% CI 0.35–0.88).
Interpretation / Conclusion: The inforatio technique, used as an adjunct to standard care, improved healing compared with standard care alone. Fewer ulcer-related adverse events were observed, further supporting the potential of the inforatio technique as an adjunctive treatment for diabetic foot ulcers.

113. Ankle arthrodesis fixation with screws versus plate– a cohort study from Kolding Hospital of 137 patients

Kristine Bollerup Arndt[1], Troels Seerup [1], Thomas Friis Østergaard [1], Ane Simony [1,2]
1. Department of Orthopaedic Surgery, Lillebaelt Hospital, Kolding, Denmark 2. Department of Regional Health Research, Institute of Regional Health Research (IRS), University of Southern Denmark (SDU), Odense, Denmark

Background: Ankle arthrodeses are traditionally fixated with screws, but an ankle fusion plate might provide a more stable construct.
Aim: To investigate risk of reoperations after screw versus plate fixation of ankle arthrodeses in a retrospective cohort of patients. Secondary aim was to investigate wound complications and infections postoperatively.
Materials and Methods: Retrospective cohort study of patients undergoing ankle arthrodesis with plate (n=89) or screw fixation (n=48) in the period 1 January 2010 to 31 December 2024 at Kolding Hospital, Denmark. Data was retrieved from medical journals. Hazard ratio was calculated by Cox regression.
Results: 35% and 17% of patients undergoing arthrodesis with screw versus plate fixation underwent reoperation. The overall risk of reoperation was not significantly different between screw or plate fixation, p=0.268. The risk of reoperation for the indication nonunion was significantly lower after plate fixation versus screw fixation, hazard ratio 0.062 [0.0078- 0.501], p=0.009. 8% experienced wound complications or superficial infection within 30 postoperative days in the screw fixation group and 9% in the plate fixation group respectively, p=0.230.
Interpretation / Conclusion: Patients undergoing ankle arthrodesis experienced fewer reoperations for nonunion with plate fixation than screw fixation. The overall risk of reoperation was not significantly different, though a tendency towards fewer reoperations after plate fixation was seen. This supports the hypothesis that plate fixation provides a more stable construct than screw fixation and should be preferred as fixation method.

114. A Danish Nationwide Cohort of Foot Health in Individuals with Diabetes From the Danish Foot Status Database

Amanda Esmann Olesen[1,2], Kathrine Kold Sørensen[3], Cæcilie Stilling Denholt[3], Puriya Daniel Würtz Yazdanfard[3], Christina Ystrøm Bjerge[4], Mai Brit Bach[4,5], Søren Nygaard Sørensen[4], Christian Torp-Pedersen[3], Betina Højgaard[3], Müjgan Yilmaz Altun[1,6], Sahar Moeini[7], Mikkel Porsborg Andersen[3,8,9], Peter Lommer Kristensen[6,10], Jonas Askø Andersen

1. Department of Orthopedics, North Zealand Hospital, Denmark, 2. Department of Public Health and Epidemiology, University of Copenhagen, Denmark, 3. Copenhagen University Hospital, Steno Diabetes Center Copenhagen, Herlev, Denmark, 4. The Association of Danish Podiatrists, 5. Steno Diabetes Center Aarhus, 6. Department of Clinical Medicine, University of Copenhagen, Denmark, 7. Department of Orthopedics, Zealand Hospital, Denmark, 8. The Prehospital Center, Region Zealand, Næstved, Denmark, 9. Department of Health Science and Technology, Aalborg University, Aalborg, Denmark, 10. Department of Endocrinology and Nephrology, North Zealand Hospital, Denmark.

Background: Foot complications are a frequent and serious consequence of diabetes, leading to pain, reduced mobility, and increased risk of amputation and death. Danish health authorities recommend that individuals with diabetes attend annual consultations at state-authorized podiatrists to assess their foot health. This study provides a nationwide description of foot health at the first consultation at a state authorized podiatrists, highlighting the scope and characteristics of complications in Danish individuals with diabetes.
Aim: Objectives This study presents a nationwide cohort description of individuals with diabetes attending a state-authorized podiatrist in Denmark, based on the Danish Foot Status database.
Materials and Methods: Research Design and Methods This nationwide cohort description used data from the Danish Foot Status Database, which contains data on individuals with diabetes attending annual consultations with state-authorized podiatrists. Individuals were identified via their unique central person register number. Data were collected from initiation of the database September 2015 till the end of June 2025. Data was collected and presented from the individual's first annual consultation with a state-authorized podiatrist.
Results: Results The Danish Foot Status Database includes 1,104,889 unique entries from 241,599 individuals with diabetes. Of individuals attending their first consultation with a state-authorized podiatrist, 43% were male, 6.0% had type 1 diabetes, and the median diabetes duration was 2 years. Neuropathy assessed by biothesiometry >25V was present in 48%, 12% had absent pedal pulse in arteria dorsalis pedis and 19% absent pulse in arteria tibialis posterior, and 91% had at least one malalignment of the foot. Current diabetic foot ulcer was recorded in 4.2%, prior diabetic foot ulcer in 2.7%, and amputation in 0.5%.
Interpretation / Conclusion: Conclusion This cohort description outlines foot health on a Danish nationwide level among individuals with diabetes. The Danish Foot Status Database offers valuable data and a unique foundation for future research, due to extensive clinical detail on a nationwide population.

115. Midfoot Charcot reconstruction with superconstruct device.

Johnny Frøkjær[1]
University Center for Ulcer Healing, Plastic Surgical Department Z and Orthopedic Department O Odense University Hospital, Denmark

Background: Traditional treatment of Charcot foot has been complete off loading in a plaster cast or walker, until healing of bone. Residual "rocker bottom" deformity and increased risk of ulcer formation is often the result of this non operative treatment.. Since 2017 we have used "super construct" bridging technique in the treatment of unstable or severe displaced Charcot foot.
Aim: Aim of this study is to present long term results of this method in the treatment of midfoot charcot arthropathy
Materials and Methods: 30 patients, most with diabetic neuropathy, were operated from July 2017 to March 2026. Indication for surgery was severe deformity and high plantar pressure or severe instability. Fourteen patients presented with ulcer and were immobilized in a total contact cast for 11 weeks preoperatively. 19 men and 11 females were operated, mean age was 56 years and mean BMI 33 Patients were operated without tourniquet, as mean operation time was 215 minutes. All patients had fixation of medial column with screw and plate, in 18 cases supplied with lateral column fixation.
Results: Mean follow up is 67,4 months (1-104) Lateral Meary angle decreased from 23,4 to 8,3, AP Meary angle decreased from 13,3 to 4,2. Fifteen patients developed incisional wound necrosis or infection, nine of these needed secondary surgery, removal of hardware or soft tissue revision. Twentyeight patients were mobilized in orthopedic shoes at 1 year follow up examination. Three patients with deep infection were treated with a below knee amputation, one patient had a below knee ampuation 5 years after surgery because of a transfer ulcer with infection. Five patients developed a transfer ulcer under the first metatarsal head, 2 healed with off loading, 2 needed surgical off loading and 1 BKA. Five patients developed secondary Charcot in adjacent joints, 3 needed surgery. Mortality after 1 and 5 year was 0, overall mortality rate was 16.7 % mean 6,2 years after surgery from unrelated causes.
Interpretation / Conclusion: We find results after reconstruction with this method good, despite a high postoperative complication rate. Amputation rate is acceptable, transfer ulcer is a problem, mortality is low and not related to primary surgery. We can recommend this method.

116. Periprosthetic Joint Infection in Total Ankle Arthroplasty: A 14-Year Analysis of Risk Factors and Outcomes

Maximilian Budin[1,2], Sebat Base i[2], Thorsten Gehrke [2], Mustafa Citak [2]
1. Department of Orthopaedics and Trauma, Medical University of Graz, Auenbruggerplatz 5, Graz, Austria 2. Department of Orthopaedic Surgery, ENDO-Klinik Hamburg, Hamburg, Germany

Background: Periprosthetic joint infection (PJI) following total ankle arthroplasty (TAA) is a rare but severe complication, often resulting in significant morbidity and the necessity for complex revision surgery. Understanding the clinical characteristics and microbiological landscape is essential for improving management strategies.
Aim: This study aimed to evaluate the clinical features, microbiological profiles, treatment approaches, and surgical outcomes of patients who developed PJI following primary TAA.
Materials and Methods: A retrospective review was conducted on 33 patients diagnosed with PJI after primary TAA at a single center between 2004 and 2018. Data regarding demographics, comorbidities, surgical history, infection type, microbiology, and treatment protocols were analyzed to determine clinical success and failure rates.
Results: The mean patient age was 60.5 +- 10.2 years, with a male predominance (60.6%). Obesity was the most common comorbidity (48.4%), and 57.5% of cases were classified as late chronic PJI. Microbiology revealed a predominance of Gram-positive pathogens, most frequently Staphylococcus aureus, while Gram-negative organisms were present in 12.1% of cases. Two-stage revision surgery was the most common intervention (54.5%). The overall treatment failure rate was 24.2%.
Interpretation / Conclusion: PJI following TAA is more prevalent in patients with multiple comorbidities and prior surgical histories. While empirical therapy should primarily target Gram-positive bacteria, the presence of Gram-negative agents must be considered. Success requires meticulous preoperative risk optimization and targeted microbiological treatment.

SESSION 26: FREE PAPER SESSION – SHOULDER/ELBOW

Thursday, 12 November 2026

13:30 – 14:15

Room: Arkaden 8

Chairs:

Mona Nysted
Department of Orthopedic Surgery, St.Olav's University Hospital, Norway

Jeppe Vejlgaard Rasmussen
Department of Orthopedic Surgery, Copenhagen University Hospital, Herlev and Gentofte, Denmark

117. Reverse shoulder arthroplasty for acute proximal humeral head fractures Neer type III /IV with different humeral stem inclination versus non-surgical treatment: a prospective randomized controlled trial, single-blinded

Klaus W.J. Hanisch

Background: The optimal treatment of proximal humeral head fractures is controversial. Recently reverse total shoulder arthroplasty has gained expanding popularity in treating PHF. The aim of this study is to compare outcomes of two different designed rTSA's versus non-operative treatment in patients with PHF Neer type III or IV.
Aim: This RCT compares the outcome in patients with acute complex PHF treated non-operative versus rTSA. Subgroups differ in inclination of the humeral neck-shaft angle 135° versus 155°.
Materials and Methods: Patients 60 to 90 years of age with PHF allocated and block randomized in this trial. The primary outcome is Western Ontario Osteoarthritis of the Shoulder Index at one-year; secondary outcomes include Constant Murley score in total and adjusted, SSV, DASH and Elevation. Radiographs had been evaluated to state union/displacement or resorption of the fracture. The rate of healing of the tuberosities in the surgical group has been defined.
Results: We included 40 patient's non-operative vs 40 rTSA's, at one year 35 vs 30 were analyzed. There was no significant difference between the groups in terms of age, gender, or fracture type. The mean age were 72.9 years, 89 % female. At one year we found WOOS in nonoperative 56.2 vs 76.9, p, oo2 for rTSA (MCID for WOOS 12.4). The subgroups had superior outcomes with HI 135° 78.3 versus HI 155° 75.3 WOOS 1 year. The CMS at one year was superior for rTSA vs non-operative total 51.1 SD vs 36.7 adjusted 77.8 vs 55.6. SSV rTSA vs non-operative 75.8 vs 42.4. For DASH rTSA vs non-op 23.3 vs 46.4. The elevation was higher for rTSA 118,6 vs 90. In the non-operative group, most fractures healed with displacement; three non-unions occur. Tuberositas healing rate was 100% in rTSA 155°, 92.3% rTSA 135°. One periprosthetic joint infection. Five crossovers were operated delayed.
Interpretation / Conclusion: For proximal humeral head fractures Neer type III or IV in patients aged above 60 years, rTSA showed both clinically relevant and statistically significant superior outcomes compared with non-operative treatment. Humeral neck/shaft inclination 135° was superior to HI 155°. Keywords Arthroplasty; Replacement; Shoulder; Fracture; Treatment; Nonoperative. Level I; RCT

118. Impact of sex and concurrent osteoporotic fractures on mortality and serious adverse events following proximal humerus fractures: A nationwide cohort study of 92,202 patients

Mathias B. Hoff[1], Merete N. Madsen[2], Antti P. Launonen[3], Helle K. Østergaard[4]
1. Department of Orthopaedic Surgery, Viborg Regional Hospital, Denmark; 2. University Clinic for Interdisciplinary Orthopaedic Pathways (UCOP), Silkeborg Regional Hospital, Denmark and Department of Clinical Medicine, Aarhus University; 3. Musculoskeletal Diseases Centre, Tampere University Hospital, Finland; 4. Department of Orthopaedic Surgery, Viborg Regional Hospital, Denmark.

Background: Proximal humerus fractures (PHFs) are common fragility fractures in older adults and are predominantly managed non-operatively. Previous studies suggest increased mortality after PHF, particularly in men and in patients with concurrent major osteoporotic fractures (MoF), but the combined impact of sex and concurrent MoF on serious adverse events (SAEs) and mortality is not fully understood.
Aim: To investigate the independent and combined impact of male sex and concurrent MoF on SAEs and mortality in patients with non-surgically treated PHF.
Materials and Methods: In this nationwide, population-based cohort study, all Danish adults (≥18 years) with a first-time, non-surgically treated PHF registered in the Danish National Patient Registry between 1998 and 2018 were included. Outcomes were all-cause mortality at 30, 90 and 365 days and the occurrence of SAEs (stroke, myocardial infarction, pulmonary embolus, acute renal failure, and respiratory tract infection) within 30 days post-fracture. Multivariable logistic regression was used to assess associations between sex, age, concurrent MoF and SAE outcomes.
Results: A total of 92,202 patients were included. Male patients exhibited higher mortality than female patients at all time points, with mortality peaking within the first 30 days after fracture. Patients with concurrent MoF had substantially higher odds of death at 30 days, with persistently elevated odds at 90 and 365 days compared with those without MoF. Male sex and concurrent MoF were independently associated with increased odds of both mortality and SAEs. At 30 days, men had an OR for mortality of 2.58 (95% CI 2.37;2.80) compared with women, and patients with concurrent MoF had an OR for mortality of 2.95 (95% CI 2.63;3.31) compared with those without concurrent MoFs. Within 30 days, 4.76% of men and 2.78% of women experienced at least one SAE.
Interpretation / Conclusion: Male sex and concurrent MoF identify a particularly vulnerable subgroup of patients with non-surgically treated PHF. Both factors were independently associated with increased odds of death and SAEs, suggesting that PHF should be regarded as a marker of underlying frailty rather than an isolated orthopaedic event.

119. Ten-year migration patterns and clinical outcomes of the stemless Simpliciti Shoulder System: a radiostereometric analysis

Jeroen Simons[1], Bart ten Brinke[1], Jantsje Pasma[1], Brechtje Hesseling[1], Max Hoelen[1], Nina Mathijssen[1]
1. Department of Orthopaedic Surgery, Reinier Haga Orthopaedic Centre, Zoetermeer, The Netherlands

Background: Stemless implants in shoulder arthroplasty aim to reduce stem-related complications and preserve bone stock; however, concerns remain regarding long-term fixation due to the limited bone–implant interface. In a previous RSA study of the Simpliciti Shoulder System, 17/19 implants were stable at five years with no revisions for aseptic loosening. Migration was observed in 2 implants, but this was not associated with inferior clinical outcomes. The long-term clinical relevance of this migration therefore remains unknown.
Aim: To evaluate long-term migration patterns of the humeral component using model-based radiostereometric analysis (MB-RSA) and to assess long-term clinical outcomes.
Materials and Methods: In this prospective cohort study, patients undergoing total shoulder arthroplasty with the stemless Simpliciti Shoulder System were followed with MB-RSA up to 10 years. The primary outcome was humeral component migration. Secondary outcomes included CMS, OSS, DASH, VAS, and complications. Migration was analyzed using linear mixed-effects models.
Results: Twenty-four patients were included, of whom 16 completed 10-year follow-up. At ten years, median translation along the x-, y-, and z-axis was −0.14, −0.05, and 0.06 mm, respectively, and median rotation was −0.20°, −0.03°, and −0.07°. No significant changes in translation or rotation were observed between five and ten years, indicating stable fixation over time. Clinical outcomes improved postoperatively and remained stable, with no significant differences between five and ten years.
Interpretation / Conclusion: At ten years, the stemless Simpliciti Shoulder System demonstrates stable fixation without evidence of progressive migration. Clinical outcomes remained stable over time, supporting sustained clinical benefit at long-term follow-up.

120. Bankart repair does not stabilize the glenohumeral joint during an apprehension test: A 2-year prospective RSA cohort study

Josephine Olsen Kipp[1,2], Emil Toft Petersen[1,2,3], Maiken Stilling[1,2,3], Anna Zejden[4], Rikke Jellesen Åberg[4], Thomas Falstie-Jensen[2], Theis Muncholm Thillemann[2,3]
1. AutoRSA Research Group, Orthopaedic Research Unit, Aarhus University Hospital, Aarhus N, Denmark 2. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus N, Denmark 3. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark 4. Department of Radiology Aarhus University Hospital, Aarhus N, Denmark

Background: Arthroscopic Bankart repair is the most frequently performed procedure for anterior shoulder instability. Despite its widespread use, no clinical studies have evaluated glenohumeral joint (GHJ) kinematics in a clinical setting.
Aim: To evaluate GHJ kinematics in patients with anterior shoulder instability before, one year, and two years after Bankart repair during an apprehension test.
Materials and Methods: Nineteen patients with unilateral, traumatic anterior shoulder instability scheduled for Bankart repair were prospectively included. GHJ kinematics were assessed during an apprehension test using radiostereometric analysis. Measurements were performed preoperatively on both the injured and contralateral healthy shoulder, and postoperatively on the injured shoulder at one and two years. Patient-reported outcomes were evaluated using the Western Ontario Shoulder Instability Index (WOSI) preoperatively and at one and two years postoperatively. GHJ kinematics were quantified using the humeral head center and the contact point between the humerus and glenoid.
Results: In the injured shoulder, no statistically significant kinematic differences were found between the apprehension test preoperatively and after Bankart repair. After Bankart repair, the humeral head remained 1.2 mmm (95%CI 0.3; 2.0) more anterior at one year and 1.3 mm (95%CI 0.4; 2.2) at two years, compared with the healthy shoulder. Similarly, the contact point was 1.1 mm (95%CI 0.2; 2.0) more anterior at one year and 1.6 mm (95%CI 0.6; 2.6) more anterior at two years following Bankart repair. No statistically significant changes were observed in the superior-inferior direction. WOSI scores improved from 59.8% (95%CI 55.1; 64.3) preoperatively to 35.9% (95%CI 25.5; 46.2) at one year and 30.1% (95%CI 17.1; 43.0) at two years postoperatively. No patient experienced redislocation during follow-up.
Interpretation / Conclusion: During the apprehension test, the Bankart repair does not reestablish GHJ stability, as the humeral head remains anteriorly positioned, relative to the healthy shoulder. Despite this, patients report substantial functional improvement, suggesting the procedure primarily improves the perceived stability rather than restoring biomechanical stability.

121. Expectation fulfilment in rotator cuff repair

Leonie van Moorsel[1], Brechtje Hesseling[1], Just van der Linde[1]
1. Reinier Haga Orthopaedic Centre, Zoetermeer, the Netherlands

Background: Higher preoperative expectations appear to be associated with better outcomes after shoulder surgery. However, little is known about the extent to which these expectations are fulfilled in the short term or which factors influence fulfilment.
Aim: We therefore investigated the extent to which preoperative expectations are fulfilled after arthroscopic rotator cuff repair and which factors may be predictors of expectation fulfilment.
Materials and Methods: In this prospective study, 113 patients, who are at least one year post-operative after arthroscopic rotator cuff repair, were included. All patients completed several questionnaires pre- and postoperatively, including questionnaires about preoperative expectations, fulfilment of expectations, pain, anxiety and depression. To investigate which factors may by predictive of the probability of expectation fulfilment, linear regression analyses were performed at the patient level and logistic regression analyses were performed at the expectation level.
Results: Preoperatively, most patients expected significant pain relief (64.6%) and an improvement in participation in daily activity (61.9%). Postoperatively, the majority experienced substantial pain relief (66.4%), better range of motion (72.6%), and improved daily activity participation (71.7%). Expectations regarding range of motion (82.3%) and the ability to participate in daily activity (79.6%) were most often completely fulfilled. The ability to participate in sports or recreation (53.1%) was least often completely fulfilled. One year or more after surgery, 67.2% of patients had at least 80% of their preoperative expectations fulfilled, while 40.6% of patients reported complete fulfilment of all expectations. None of the predictor variables showed a statistically significant association with the fulfilment of preoperative expectations.
Interpretation / Conclusion: Fulfilment of preoperative expectations is generally high after arthroscopic rotator cuff repair. However, further research is needed to better understand which factors are associated with expectation fulfilment.

SESSION 27: FREE PAPER SESSION – HIP ARTHROPLASTY

Friday, 13 November 2026

09:00 – 09:45

Room: Columbine

Chairs:

Olof Sköldenberg
Department of Clinical Sciences, Danderyd Hospital, Karolinska Institutet, Sweden

Claus Varnum
Department of Orthopaedic Surgery, Lillebaelt Hospital – Vejle, Denmark

122. MAKO-assisted arthroplasty is safe in a Danish fast-track setting: a prospective cohort study of 2,670 procedures

Anas Adnan El-Cheikh Mahmoud[1], Simon Kornvig[1], Lasse Enkebølle Rasmussen[1], Anders Elneff Graversen[1], Claus Varnum[1,2]
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Background: Robot-assisted surgery (RAS) has been introduced to enhance surgical precision, with studies suggesting improved component positioning and early functional outcomes compared with manual surgery. In Denmark, the fast-track concept has during the last decade reduced the median length of stay (LOS) and increased same-day discharge (SDD). Whether integrating RAS into an established fast-track setting affects readmission risk, same-day discharge (SDD) or length of stay (LOS) remains unknown.
Aim: We aimed to compare 90- and 30-day readmission, SDD, and LOS > 2 days between MAKO-assisted and manual THA/TKA.
Materials and Methods: This single-center cohort study included 1,497 THAs and 1,173 TKAs from December 2023 to November 2025, performed at Lillebaelt Hospital - Vejle. Data were collected prospectively and registered in a REDCap database. Outcomes were compared between MAKO-assisted and manual surgery using log-binomial regression for readmission and LOS > 2 days, and modified Poisson regression with robust standard errors for SDD. Estimates were reported as adjusted relative risks (aRRs) with 95% confidence intervals (CI). The primary outcome, 90-day readmission, was adjusted for age, BMI, SDD eligibility, Clinical Frailty Scale score, and cohabitation.
Results: 27% of THAs (407/1,497) and 24% of TKAs (280/1,173) were MAKO-assisted. Patients receiving MAKO-assisted THA had a 90-day readmission risk of 4.4% (18/407) compared with 4.4% (48/1,090) for manual THA (aRR 1.2, CI 0.7–2.1). Also, patients receiving MAKO-assisted TKA had a 90-day readmission risk of 4.3% (12/280) compared with 6.3% (56/893) for manual TKA (aRR 0.7, CI 0.4–1.4). Finally, MAKO-assisted surgery was not associated with 30-day readmission (THA: aRR 0.8, CI 0.3–1.8; TKA: aRR 0.8, CI 0.4–1.8), SDD (THA: aRR 1.1, CI 1.0–1.2; TKA: aRR 1.1, CI 1.0–1.2), or LOS > 2 days (THA: aRR 1.0, CI 0.5–1.8; TKA: aRR 0.8, CI 0.5– 1.3).
Interpretation / Conclusion: In a Danish fast-track setting, MAKO-assisted surgery was not associated with 90- or 30-day readmission, SDD, or LOS compared with manual surgery. These results indicate that MAKO-assisted surgery can be safely implemented within an established fast-track setting.

123. Three- and Twelve-Month Follow-Up of Shared Decision-Making Supported by an In-Consult Patient Decision Aid in Hip and Knee Osteoarthritis: Results from the Cluster-Randomised Trial – PATI-Study

Trine Ahlmann Pedersen[1,2,3], Martin Lindberg-Larsen [2,3], Charlotte Myhre Jensen [2,3], Karina Dahl-steffensen [4,5], Claus Varnum [1,5]

1. Department of Orthopedic Surgery, Lillebaelt Hospital - Vejle, University Hospital of Southern Denmark, Vejle, Denmark 2. Department of Orthopedic Surgery and Traumatology, Odense University Hospital, Odense, Denmark. 3. Orthopedic Research Unit, Department of Clinical Research, University of Southern Denmark, Denmark 4. Center for Shared Decision Making, Lillebaelt Hospital - Vejle, University Hospital of Southern Denmark, Denmark 5. Department of Regional Health Research, University of Southern Denmark, Denmark

Background: Postoperative dissatisfaction after joint replacement (JR) is often linked to a mismatch between preoperative expectations and outcomes. Shared decision-making (SDM) is an established approach to enhance decisional quality in preference-sensitive conditions such as hip and knee osteoarthritis (OA). SDM can be supported by patient decision aids (PtDAs). The PATI trial previously found no significant improvement in decisional quality with an in-consult PtDA. This follow-up explores longer-term outcomes among patients who underwent surgery.

Aim: To evaluate whether SDM supported by an in-consult PtDA improves patient-reported functional outcomes (Oxford Hip/Knee Score; OHS/OKS) 12 months after JR compared with standard consultations.

Materials and Methods: This pragmatic, two-arm, multicentre cluster-randomised controlled trial included 20 orthopaedic surgeons randomised 1:1, stratified by centre, to SDM supported by an in-consult PtDA (intervention) or standard consultations (control). Patients with severe primary hip or knee OA were recruited at two university hospitals in Denmark (Oct 2023– Nov 2024). This analysis includes data from one centre. OHS/OKS were collected at baseline and 12 months. Marginal mean differences with 95% confidence intervals (CI) were estimated using multilevel Tobit regression adjusted for surgeon clustering.

Results: A total of 319 patients were included (164 hip, 155 knee). No significant differences were found in OHS improvement after 12 months (–0.25, CI: –3.93; 3.44). For knee arthroplasty, the intervention group showed a significant difference in improvement in OKS (5.20, CI: 1.69; 8.71). Baseline OHS (1.54, CI: –1.03; 4.11) and OKS (–1.72, CI: –4.20; 0.76) showed no significant difference between groups.

Interpretation / Conclusion: Shared decision-making supported by an in-consult PtDA was associated with greater improvement in functional outcomes 12 months after total knee replacement, whereas no effect was found for hip replacement

124. The interaction between multimorbidity and total hip arthroplasty due to osteoarthritis on the risk of long-term opioid therapy

Isabella Engelbrekt Mikkelsen[1], Shannie Sangild Hedelund [1], Alma Becic Pedersen [1]
1. Department of Clinical Epidemiology, Aarhus University and Aarhus University Hospital, Aarhus, Denmark

Background: Long-term opioid therapy (LTOT) after total hip arthroplasty (THA) is a challenge for patient safety and public health.
Aim: We examined whether multimorbidity interacts with THA due to osteoarthritis (OA) to increase the risk of LTOT beyond their individual effects.
Materials and Methods: Using Danish registries, we included 85,471 aged >50 years undergoing primary THA due to OA (2000-2018) and an age- and sex-matched comparison cohort from the general population without THA (n=427,355). Multimorbidity was measured using the Charlson Comorbidity Index (CCI in categories none, moderate, or severe). LTOT was defined as ≥2 dispensings of opioids from 31 to 365 days after THA date, which was the index date for comparison cohort members. Absolut measure of interaction between multimorbidity and THA on LTOT risk were assessed with 95% confidence intervals (CI).
Results: The LTOT risk was 21% in the THA cohort compared to 11% in the comparison cohort corresponding to the adjusted risk ratio (RR) for LTOT of 1.88 (CI: 1.86-1.91). The RR increased with increasing CCI being 4.58 (CI: 4.41-4.75) for THA with CCI=severe vs comparison cohort with CCI=none. Among THA patients with CCI=moderate, the LTOT risk was 27% vs 16% in the comparison cohort of the same CCI and the interaction accounted for 1% of LTOT risk. For THA patients with a CCI=severe, the LTOT risk was 36% vs 26% in the comparison cohort of the same CCI and the interaction accounted for 0% of LTOT risk.
Interpretation / Conclusion: Patients with OA undergoing THA have a notably higher risk of LTOT compared with the general population without THA. The LTOT risk increased alongside multimorbidity severity. We found a limited synergistic effect between multimorbidity and THA on LTOT risk. Our findings highlight the importance of more targeted pain and opioid management strategies for multimorbid THA patients.

125. Physical impairments in patients with lateral hip pain: a systematic review with meta-analysis

Signe Kierkegaard-Brøchner[1], Anthony Nasser[2], Marie Bagger Bohn[1], Stian Langgård Jørgensen[3], Jeppe Lange[1], Alison Grimaldi[4], Mathew King[5]

1. H-HIP, Horsens Hospital, Horsens, Denmark; 2. University of Technology Sydney, Graduate School of Health, Australia; 3. VIA University College, Aarhus, Denmark; 4. University of Queensland, School of Health & Rehabilitation Sciences, Australia; 5. Department of Physiotherapy, Podiatry, Prosthetics and Orthotics, School of Allied Health Human Services and Sport, La Trobe University, Australia.

Background: Patients with lateral hip pain commonly report difficulties with physical tasks, yet the severity of objectively measured performance deficits is not well established.
Aim: We aimed to investigate objectively measured physical impairments in patients with lateral hip pain compared with 1) healthy reference persons, 2) their contralateral healthy leg.
Materials and Methods: After protocol registration in PROSPERO, we searched five databases. Two reviewers independently conducted title/abstract screening, full-text screening, risk of bias assessment(Newcastle–Ottawa Scale), and data extraction. Meta-analyses were performed using standardized mean differences(SMD) with 95% confidence intervals. Between-study heterogeneity was assessed(I^2) and the certainty of evidence was evaluated(GRADE).
Results: Of 2,311 studies, a total of 16 studies concerning 10 different patient samples from three countries/continents were included. 417 patients, 374 women (90%) were included with a mean age ranging from 47.8 to 63.4 years, except for one study that had a mean age of 25.6 years. There was some Risk of Bias and the certainty of evidence was low to very low. Patients demonstrated lower maximal hip strength in abduction (-1.04 [-1.34;-0.74], I^2=52%), extension (-1.14 [-1.88;-0.40], I^2=83%) and external rotation (-0.86 [-1.71;-0.02], I^2=80%) compared with healthy controls and compared with their own contralateral leg: hip abduction (-0.37 [-0.48;-0.25], I^2=0%), extension (-0.60 [-0.85;-0.35], I^2=18%) and external rotation (-0.37 [-0.72;-0.03], I^2=69%). Patients demonstrated slower self-selected walking speed (-0.63 [-1.02;-0.24], I^2=0%), decreased performance in the Sit to Stand Test (-1.04 [-1.59;-0.50], I^2=71%) and Timed up and Go test (-1.08 [-1.95;-0.21], I^2=77%), respectively. Individual studies investigated single-leg balance, walking performance and stair climbing, all of which demonstrated impairments in patients compared with healthy controls.
Interpretation / Conclusion: Patients with lateral hip pain demonstrated lower maximal hip muscle strength during hip abduction, extension and external rotation. Furthermore, their physical function was notably impaired underscoring the need for targeted treatment strategies for this patient group.

126. What is the clinical benefit of prescribing physical rehabilitation after total hip arthroplasty? A pooled analysis of a randomized controlled trial with a 12-month follow-up (DRAW1) and its replication trial (DRAW2)

Troels Mark-Christensen[1,2], Kristian Thorborg[3,4,5], Thomas Kallemose[2], Thomas Bandholm[2,4,5,6]
1. Department of Rehabilitation, Centre of Health, Regional Municipality of Bornholm, Rønne, Bornholm, Denmark. 2. Department of Clinical Research, Copenhagen University Hospital – Amager and Hvidovre, Copenhagen, Denmark. 3. Sports Orthopaedic Research Center – Copenhagen (SORC-C), Department of Orthopedic Surgery, Amager-Hvidovre Hospital, Institute for Clinical Medicine, Copenhagen University, Denmark. 4. Physical Medicine and Rehabilitation Research-Copenhagen (PMR-C), Department of Physical and Occupational Therapy, Copenhagen University Hospital, Amager-Hvidovre, Hvidovre, Denmark. 5. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark. 6. Department of Orthopedic Surgery, Copenhagen University Hospital, Amager and Hvidovre, Copenhagen, Denmark.

Background: Physical rehabilitation is commonly prescribed after total hip arthroplasty (THA), although comparative trials between rehabilitation interventions show minimal differences.
Aim: To assess the effectiveness of prescribing physical rehabilitation after THA compared with not prescribing it.
Materials and Methods: We conducted a prespecified pooled analysis of patients with THA from two randomized controlled trials—DRAW1 and its identically conducted replication trial, DRAW2—using a three-arm parallel-group superiority design with blinded outcome assessment. Participants were recruited from outpatient municipal rehabilitation services on Bornholm, Denmark. Patients undergoing primary unilateral THA due to osteoarthritis were eligible. Participants were randomly allocated (1:1:1) by computer-generated block randomization with allocation concealed in sequentially numbered opaque envelopes by an external physiotherapist to receive home-based telerehabilitation, home-based rehabilitation, or no prescribed physical rehabilitation for 6 weeks. The primary outcome was the Hip disability and Osteoarthritis Outcome Score activities of daily living subscale (HOOS-ADL) at 6 weeks. Analyses followed intention-to-treat principle with multiple imputation for missing data.
Results: Between Feb 19, 2019, and March 13, 2023, 429 patients were screened, and 169 were enrolled and randomly assigned to telerehabilitation (n=55), home-based rehabilitation (n=58), or not prescribed rehabilitation (n=56). In the primary intention-to-treat comparison of prescribing physical rehabilitation versus no prescribed rehabilitation, the mean difference in HOOS-ADL at 6 weeks was 1·8 points (95% CI: −0·8 to 4·4; p=0·17). Differences were 2·5 points (95% CI: −0·1 to 5·0; p=0·06) at 3 months and 2·0 points (95% CI: −0·8 to 4·8; p=0·16) at 12 months. Six adverse events occurred (three in rehabilitation groups and three in the no-rehabilitation group).
Interpretation / Conclusion: Prescribing structured physical rehabilitation after THA did not provide clinically meaningful improvement in self-reported daily function compared with not prescribing rehabilitation.

SESSION 28: FREE PAPER SESSION – TRAUMA

Friday, 13 November 2026

09:00 – 09:45

Room: Harlekin

Chairs:

Frede Frihagen
Department of Orthopaedic Surgery and Traumatology, Østfold Hospital Trust, Norway

Christina Frølich Frandsen
University Clinic for Hand, Hip and Knee Surgery, Regional Hospital Gødstrup, Denmark

127. Postoperative mobility is associated with risk of reoperationand increased mortality after hip fracture: a nationwide cohort study of 33,486 patients

Simon Storgaard Jensen[1,2], Per Hviid Gundtoft[3], Jan-Erik Gjertsen[4,5], Alma B. Pedersen[1,2]
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Background: Postoperative mobilization may influence the outcome following hip fracture.
Aim: We aimed to examine whether regaining pre-fracture basic mobility on discharge is associated with subsequent risk of reoperation and mortality.
Materials and Methods: Using nationwide Danish registries, we identified 33,486 patients ≥ 65 years who underwent hip fracture surgery between January 2016 and November 2021. Pre-fracture and discharge mobility were assessed with the Cumulated Ambulation Score (CAS, score 0–6 where 6 is best ambulation). The exposure was regaining pre-fracture CAS at discharge. Adjusted hazard ratios (aHRs) with 95% confidence intervals (CIs) for reoperation and mortality up to 365 days were estimated using Cox regression, adjusting for age, sex, surgery year, length of stay, and comorbidities.
Results: On discharge, 19,329 patients (65%) had not regained pre-fracture CAS. The 30-day reoperation risk was similar among patients who had not regained CAS (2.9%) and those who had (2.5%; aHR 1.10, CI 0.94–1.29). At 365 days, not regaining CAS was associated with a lower reoperation risk (7.1% vs 8.6%; aHR 0.98, CI 0.89–1.07). A CAS loss of 1–2 points was associated with an increased 30-day reoperation risk (aHR 1.20, CI 1.00–1.44). CAS decline was consistently associated with higher mortality at 30 days (aHR 2.07, CI 1.82–2.35) and 365 days (aHR 1.77, CI 1.66–1.89), with progressively higher rates at greater CAS decline.
Interpretation / Conclusion: We found no consistent association between failure to regain pre-fracture mobility on discharge and reoperation, although patients with a 1–2 point CAS loss experienced a modestly higher 30-day reoperation risk. In contrast, failure to regain pre-fracture mobility was strongly associated with increased mortality up to 1 year after hip fracture.

128. Patient-reported outcomes in patients aged ≥60 years with a dorsally displaced distal radius fractures before and after the change of standard care: a retrospective cohort study

Dilay Kesgin Fener[1,2], Frederik Godthjælp Petersen [1], Stig Brorson [1,2], Dennis Winge Hallager [1,2]
1. Center for Evidence-Based Orthopaedics, Zealand University Hospital and Department of Clinical Medicin, University of Copenhagen, Denmark; 2. Department of Orthopaedics, Zealand University Hospital, Køge, Denmark.

Background: In 2021, a local guideline was implemented, recommending non-surgical management for dorsally displaced distal radius fractures (DDDRF) in patients aged ≥60 years.
Aim: To compare patient-reported outcomes (wrist satisfaction, PRWHE, EQ-5D-5L, and QuickDASH) between two retrospectively defined cohorts of patients with DDDRF treated before and after the local guideline was implemented.
Materials and Methods: Patients aged ≥60 years, treated at our institution for a DDDRF between February 1, 2019, and January 31, 2023, were screened for inclusion. Patients were stratified into two groups according to treatment period: before and after the implementation of a local guideline. Exclusion criteria were high energy trauma, open fractures, neurovascular compromise, previous fracture on the same side, other fractures, and patients relying on a walking aid in the injured hand or rejected use of data for quality assessment. Questionnaires were distributed via e-boks, and non-responders were contacted by phone.
Results: Of 428 eligible patients, 102 were excluded (73 deceased, 24 with dementia, 5 terminally ill). Of 326 contacted, 123 did not respond, and 30 reported a new injury, leaving 96 in the before group and 77 in the after group for analysis. Before implementation, 24% were treated non-surgically (median follow-up 5.8 years); after implementation, 82% were treated non-surgically (median follow-up 3.6 years). The proportion of patients satisfied with their wrist was 94% before and 79% after implementation (p=0.004). Median (IQR) scores were PRWHE 0 (0, 10) before and 8 (0, 25) after implementation, p=0.002; EQ5D-5L 1.00 (0.88, 1.00) before and 0.97 (0.84, 1.00) after, p=0.07; and QuickDASH 7 (2,16) before and 11 (2, 27) after, p=0.03. Phone follow-up is ongoing to increase the response rate.
Interpretation / Conclusion: Implementation of non-surgical treatment as standard care was associated with a statistically significant lower PRWHE and QuickDASH scores and reduced rate of wrist satisfaction by 15%. This reduction in satisfaction contrasts with the reduced rate of surgical treatment by 58% indicating that surgical treatment is not closely associated with satisfaction for most patients.

129. Evaluating Convolutional Neural Networks for Nonunion Prediction in Humerus Shaft Fractures

Siyarcan Yucel[1,2], Marko Moilanen [3], Laura Kärnä [1,5], Sami Äyrämö [3,4], Aleksi Reito [1,5]
1. Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland 2. Faculty of Information Technology and Communication Sciences, Tampere University, Tampere, Finland 3. Faculty of Information Technology, University of Jyväskylä, Jyväskylä, Finland 4. Hospital Nova of Central Finland, Wellbeing Services County of Central Finland, Jyväskylä, Finland 5. Center for Musculoskeletal Diseases, Tampere University Hospital, Tampere, Finland

Background: Humerus shaft fractures account for 1–3% of all adult fractures with an incidence of 10-15 cases per 100,000 population-years. Their potential progression to nonunion during nonoperative care is a common concern that may require multiple complex surgical interventions. Early and accurate prediction of nonunion and delayed healing is crucial for optimizing patient care, guiding interventions, and reducing socioeconomic burdens.
Aim: This study investigates the feasibility of using deep learning models to predict the healing outcome of nonoperative treatment of humerus shaft fractures from initial injury radiographs, a task for which no established AI methods exist.
Materials and Methods: We developed a systematic pipeline to evaluate ten distinct convolutional neural network (CNN) architectures, each tested with and without Canny edge detection preprocessing. A 10-iteration random search was conducted for each of the 20 configurations to find optimal hyperparameters. Models were trained on a dataset of 781 images from 420 patients and validated on 151 images from 84 patients. The best-performing model, ranked by validation Area Under the Receiver Operating Characteristic Curve (AUC), was retrained on the combined training and validation data and then independently evaluated on a held-out test set of 108 images from 56 patients.
Results: The systematic evaluation identified VGG16 without Canny edge detection as the bestperforming architecture. On the held-out test set, the final model achieved an AUC of 0.550. At an optimal probability threshold of 0.890, selected to maximize the F1-score, the model achieved an accuracy of 41.8%, a precision of 28.6%, a recall (sensitivity) of 81.5%, and an F1-score of 0.423.
Interpretation / Conclusion: Despite a rigorous evaluation of multiple deep learning models, predictive performance for humerus shaft nonunion from initial radiographs was only slightly better than random chance. This result underscores the inherent difficulty of this clinical problem using standard 2D imaging and CNNs alone, suggesting that developing a clinically viable predictive tool will likely require more nuanced clinical outcome definition, advanced techniques or substantially larger datasets

130. Epidemiology of humerus shaft fractures: An international comparison of incidence and treatment choice for a contested fracture

Emir Ouahrani[1], Abdul Rashid Qureshi[2], Kenji Momo[3], Aleksi Reito[1,4], Li Felländer-Tsai[1]
1. Division of Orthopaedics and Biotechnology, Department of Clinical Science, Intervention and Technology, Karolinska Institutet and Trauma, Emergency Surgery and Orthopedics, Karolinska University Hospital, Stockholm, Sweden. 2. Division of Renal Medicine and Baxter Novum, Department of Clinical Science, Intervention and Technology, Karolinska Institutet, Stockholm, Sweden. 3. Division of Clinical Research, Department of Hospital Pharmaceutics, School of Pharmacy, Showa Medical University, Tokyo, Japan. 4. Tampere University Hospital, Center for Musculoskeletal Diseases, Tampere, Finland. Coxa Hospital for Joint Replacement, Tampere, Finland.

Background: This paper explores the incidence and treatment trends of humerus shaft fractures (HSF) in three countries: Sweden, Finland, and Japan. No single optimal treatment exists has been established, with advantages and disadvantages for both operative and nonoperative approaches. Treatment failure may place patients in dependence, with many experiencing limitations in activities of daily living (ADL).
Aim: To investigate: (1) incidence and operative treatment of HSF, (2) trends in treatment choice, and (3) international and regional differences in treatment choice.
Materials and Methods: This study was conducted through a retrospective analysis of national registries to identify HSF between 2001-2021 in Sweden and Finland. In Japan, data was obtained from insurance registers covering the years 2016-2021. Each of these repositories was queried for ICD-code S423. Data on nonoperative and operative treatment could be obtained for Sweden and Japan, while Finnish registers only contained data for operatively treated fractures. Incidence was calculated and trends in operative treatment analysed using a negative binomial regression. Further analysis was conducted using descriptive statistics.
Results: The mean incidence of HSF was 16.4/100,000 patient-years in Sweden and 13.3/100,000 in Japan. Mean incidence of operatively treated fractures in Sweden was 2.51/100,000, in Finland 5.2/100,000, and in Japan 4.0/100,000. Regional operative incidence varied within all three countries. In Sweden, rates ranged from 1.59/100,000 (Västerbotten) to 4.62/100,000 (Jönköping) with a temporal trend ($p<0.05$) towards conservative treatment. In Finland rates ranged from 3.56/100,000 (Kainuu) to 9.25/100,000 (central Ostrobothnia). In Japan rates ranged from 3.14/100,000 (South Kanto) to 5.68/100,000 (Kinki). 15.2% and 28.2% of patients received surgery as primary treatment in Sweden and Japan, respectively.
Interpretation / Conclusion: The three countries lie on a spectrum across the treatment paradigm and exhibited intraregional differences in treatment choice despite similar fracture incidence. This variation highlights substantial differences in clinical practice, which may reflect limited availability or uneven implementation of evidence-based guidelines.

131. Incidence of Fracture Nonunion in Two Finnish Hospitals between 2001 and 2021: A Retrospective Cohort Study

Valtteri Panula[1,2], Juho Laaksonen [1,2,5], Kati Kyrölä [1], Elina Ekman [3,4], Aleksi Reito [2,5]
1. Department of Surgery, Central Finland Central Hospital, Jyväskylä, Finland 2. Center for Musculoskeletal Diseases, Tampere University Hospital, Tampere University, Tampere, Finland 3. Department of Orthopaedics and Traumatology, Turku University Hospital, University of Turku, Turku, Finland 4. Faculty of Medicine, University of Turku, Turku, Finland 5. Faculty of Medicine and Health Technology, University of Tampere, Tampere, Finland

Background: Fracture nonunion remains a significant complication associated with substantial morbidity and healthcare costs. Despite extensive research, population-based estimates of nonunion incidence remain scarce in the Nordic countries.
Aim: To determine the incidence, temporal trends, and anatomical distribution of fracture nonunion in two Finnish hospital districts over 20 years, and to assess sex-specific differences in nonunion risk.
Materials and Methods: This retrospective cohort study included all adult patients (≥18 years) diagnosed with fracture nonunion (ICD-10: M84.1) or treated under relevant surgical procedure codes in the Pirkanmaa and Central Finland Welfare Areas between 2001 and 2021. Incidences were calculated per 100,000 person-years, and incidence rate ratios (IRRs) with 95% confidence intervals (CIs) were computed using Poisson approximation.
Results: A total of 1,149 patients were identified (56% male); the median age of the overall study population was 52 years. Mean incidence of fracture nonunion was 7.2 per 100,000 person-years, with an annual increase of 4% (IRR 1.04; 95% CI 1.03–1.05). Incidence peaked in 2012, declined gradually, with a secondary peak in 2020. Males demonstrated higher incidence than females (4.0 vs. 3.1 per 100,000 person-years; IRR 1.29; 95% CI 1.15–1.45). Most nonunions followed traumatic fractures (99%); conservative management was the most frequent primary treatment (49%). The upper extremity accounted for 66% of all nonunion cases. The most commonly affected bones were the humerus (25%), scaphoid (16%), femur (13%), tibia (11%), and clavicle (10%).
Interpretation / Conclusion: Fracture nonunion incidence across two Finnish hospital districts showed an upward trend over two decades, predominantly affecting men and upper extremity fractures. These findings offer valuable population-based reference data for future studies addressing nonunion risk factors and preventive strategies.

SESSION 29: FREE PAPER SESSION – SHOULDER/ELBOW

Friday, 13 November 2026

09:00 – 09:45

Room: Blomster salen

Chairs:

Augustinas Rimkunas
Department of Orthopaedic, Hospital of Lithuanian University of Health Sciences Kauno Klinikos, Lithuania

132. “Survival rates and clinical outcomes of hybrid and all-polyethylene glenoid components in anatomic total shoulder arthroplasty. A comparative study from the Danish Shoulder Arthroplasty Register.”

Adriano Axel Ceccotti[1], Mikkel Tøttrup [2], Jeppe Rasmussen [3], Steen Lund Jensen [3]
1. Interdisciplinary Orthopaedics, Aalborg University Hospital, Denmark 2. Department of Orthopaedics, Aarhus University Hospital, Denmark 3. Department of Orthopaedics, Gentofte Hospital, Denmark

Background: Aseptic loosening of the glenoid component remains a major concern in anatomic total shoulder arthroplasty (aTSA). Hybrid glenoid designs combining cemented polyethylene with central bone-ingrowth fixation have shown promising short- to mid-term results, but comparative evidence from large cohorts is limited.
Aim: We compared implant survival and clinical outcomes between hybrid and cemented all-polyethylene glenoid components using nationwide registry data.
Materials and Methods: We conducted a retrospective cohort study based on the Danish Shoulder Arthroplasty Register (DSR). All primary aTSAs performed between January 1, 2011, and December 31, 2025, using either hybrid or all-polyethylene glenoid components were included. The primary outcome was revision. Secondary outcomes included revision for any cause, reoperation, and Western Ontario Osteoarthritis of the Shoulder (WOOS) score. Kaplan–Meier survival analysis with log-rank test was used to compare groups. Cox proportional hazards models were applied to estimate adjusted hazard ratios (HRs).
Results: In the adjusted Cox regression analysis, hybrid glenoid fixation was not associated with a statistically significant difference in the hazard of revision compared with all-poly fixation (HR 1.18, 95% CI 0.85–1.65, $p = 0.324$). Increasing age was associated with a lower hazard of revision (HR 0.95 per year, 95% CI 0.94–0.97, $p < 0.001$). There was no significant association between revision and sex (HR 0.98, 95% CI 0.69–1.38, $p = 0.888$) or operative time (HR 1.00, 95% CI 0.99–1.01, $p = 0.782$). A higher Charlson Comorbidity Index showed a trend toward increased revision hazard, although this did not reach statistical significance (HR 1.09, 95% CI 0.99–1.19, $p = 0.066$). Rotator cuff status was not significantly associated with revision (HR 1.39, 95% CI 0.51–3.81, $p = 0.516$). The Kaplan-Meier survival function showed no significant difference between the all-polyethylene and the hybrid group.
Interpretation / Conclusion: Hybrid glenoid fixation was not associated with a significantly different revision hazard compared with all-poly fixation (HR 1.18, 95% CI 0.85– 1.65).

133. Is there an association between preoperative use of antidepressant and patient-reported outcome 1 year after shoulder arthroplasty for cuff tear arthropathy or osteoarthritis?

Carl Johan Queitsch[1], Marie Louise Jensen[1], Alexander Scheller Madrid[1], Jeppe Vejlgaard Rasmussen[1,2]
1. Department of Orthopedic Surgery, Herlev and Gentofte Hospital, Hellerup, Denmark 2. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark

Background: Anatomical and reverse total shoulder arthroplasty have proven effective in the treatment of glenohumeral osteoarthritis. Mental health diagnoses such as depression are increasingly common, and studies have found conflicting associations with patient-reported outcome in total knee and hip arthroplasty surgery. Studies examining shoulder surgery and depression remain limited and has not been examined on a national level
Aim: To examine the association between preoperative use of antidepressant and patient-reported outcome following shoulder arthroplasty.
Materials and Methods: This study was a cohort study using registry data from the National Health Service Prescription Database, the National Patient Registry and the Shoulder Arthroplasty Registry. From January 1, 2004, to December 31, 2018 a total of 3021 patients were included and categorized into two groups: an antidepressant group and a non-antidepressant group. A uni- and multivariable linear regression model was utilized to examine potential differences in patient-reported outcome using the Western Ontario Osteoarthritis of the Shoulder Index (WOOS). Age, sex, indication, arthroplasty type, previous surgery and Charlson Comorbidity Index were included in the multivariable analysis. A minimal clinically important difference (MCID) of 12.3 was used as a measure of clinically relevant difference.
Results: There were 481 (16%) in the antidepressant group with a mean WOOS score of 66 (standard deviation = 28) and 2540 (84%) in the non-antidepressant group with a mean WOOS score of 73 (standard deviation = 25). In the univariate linear regression model, we found a difference of -7.8 (95% confidence interval [CI] -10 to - 5.3, P < 0.001) with non-depression group as reference. In the multivariable linear regression model, a difference of -6.7 (95% CI -9.2 to 4.2, P < 0.001) was found.
Interpretation / Conclusion: Use of antidepressant was associated with poorer patient-reported outcome one year after shoulder arthroplasty for osteoarthritis or cuff-tear arthropathy. However, the difference was small and may not be clinically relevant. Shoulder arthroplasty is associated with good results and the use of shoulder arthroplasty should not be opt out due to use of antidepressant.

134. The Latarjet procedure for traumatic anterior shoulder instability: A comparative analysis of on-track and off-track Hill Sachs lesions

Andreas Saine Granlund[1], Andreas Falkenberg Nielsen [1], Anton Schiøtz Brown [1], Jeppe Vejlgaard Rasmussen [1]

1. Department of Orthopedic Surgery, Herlev and Gentofte Hospital, Hellerup, Denmark

Background: Off-track Hill-Sachs lesions may be associated with an increased risk of revision following arthroscopic Bankart repair, and these patients are often referred for the Latarjet procedure. However, outcomes after Latarjet may differ between patients with off-track and on-track lesions.
Aim: To investigate whether off-track Hill-Sachs lesions are associated with increased risk of revision or inferior functional outcome following the Latarjet procedure.
Materials and Methods: This was a comparative retrospective cohort study including all patients undergoing Latarjet procedures between April 2020 and April 2025 at a tertiary shoulder and elbow center. A total of 135 primary Latarjet procedures were identified; 25 were excluded due to epilepsy (n=16), multidirectional instability (n=9) and posterior instability (n=0) leaving 110 patients for analysis. Patients were classified as on-track or off-track using the method described by Itoi E. Revision-free survival was analyzed using Kaplan–Meier curves. Cox proportional hazards regression adjusted for age and sex was used to estimate hazard ratios (HR). Patient-reported outcomes were assessed using Western Ontario Shoulder Instability Index (WOSI), converted to percentages, and analyzed using multivariable linear regression.
Results: During follow-up, 13 revision events were observed. Kaplan–Meier analysis showed a 2- year revision-free survival of 83% (95% CI 71 to 95) for on-track patients and 92% (95% CI 82 to 100) for off-track patients. The HR for revision in on-track patients was 2.3 (95% CI 0.68 to 7.79) using off-track as reference. Mean WOSI was 64 (SD 23) in the on-track group and 66 (SD 18) in the off-track group, with a mean difference of 2 percentage points (95% CI −10 to 14). Female sex was associated with worse WOSI scores (mean difference 18; 95% CI 6 to 30).
Interpretation / Conclusion: We found no evidence of increased revision risk or inferior patient-reported outcomes in patients with off-track compared to on-track lesions following Latarjet. These findings suggest that factors beyond tracking status influence outcomes, warranting further investigation.

135. The development of the arthroscopic sling technique for anterior shoulder instability

Jan Arild Klungsøyr[1], Terje Vagstad[1], Peter Johannes Klungsøyr[1], Tor Åge Myklebust[2], Håkon Lund Hanssen[3], Solveig Roth Hoff[4,5], Drogset Jon Olav[6]

1. Department of Orthopedic Surgery, Ålesund Hospital, Møre and Romsdal Hospital Trust, Ålesund, Norway; 2. Department of Research and Innovation, Møre and Romsdal Hospital Trust, Ålesund, Norway; 3. Department of Radiology and Nuclear Medicine, St. Olav's Hospital, Trondheim University Hospital, Trondheim, Norway; 4. Department of Radiology, Ålesund Hospital, Møre and Romsdal Hospital Trust, Ålesund, Norway; 5. Department of Circulation and Medical Imaging, Faculty of Medicine and Health Sciences, Norwegian University of Science and Technology (NTNU), Trondheim, Norway; 6. Department of Orthopedic Surgery, Trondheim University Hospital and Norwegian University of Science and Technology (NTNU) Trondheim, Norway

Background: Patients with anterior shoulder instability often need surgical attention.There are many surgical techniques available for the orthopedic surgeon. The Bankart procedure is normally the first choice of surgery. There are more complex non-anatomic techniques applicable which may have higher risk of complications. This presentation describes the development of a novel arthroscopic procedure and the results of the first patients treated with the arthroscopic sling technique. This relatively anatomic procedure may gap the big difference between the anatomic Bankart and the more complex non-anatomic procedures for anterior shoulder instability.
Aim: To present the idea of the sling and the technical surgical steps. The aim is further to analyze the results of the sling procedure for anterior shoulder instability in patients with less than 10 % anterior glenoid bone loss.
Materials and Methods: Patients were treated surgically with the arthroscopic subscapular sling procedure. A semitendinosus graft was used to reconstruct the anterior labrum and to establish a sling suspension around the upper part of the subscapularis tendon. The patients were followed up with radiographs (12 and 24 months). Magnetic resonance imaging (MRI) of the shoulder region and clinical examinations were performed at 3, 12 and 24 months. Recurrent dislocation was the primary endpoint. The Western Ontario Shoulder Instability Index (WOSI) and MRI results were secondary outcome measures. Residual instability and range of motion were assessed.
Results: The clinical study included fifteen patients treated with the sling technique.The dislocation rate was 0% after 24 months follow-up.There was a significant clinical improvement of the WOSI score from 57% at baseline to 88% ($P < .001$).MRI showed an intact sling in all patients. External rotation was not significantly reduced. Flexion and abduction were significantly improved from 152° to 174° ($P = .001$) and 141°to 170°($P < .001$) after 24 months. No intraoperative complications were observed.
Interpretation / Conclusion: The sling procedure resulted in low recurrent shoulder instability and improved PROMs at 24 months follow-up. Future studies may shed more light over the sustainability of the sling technique.

136. What can national registries tell about the association between humeral neck-shaft angle and the risk of revision following reverse shoulder arthroplasty - a combined registry study from Australia and Denmark

Marie Louise Jensen[1,2], Richard Page[3,4], Bo Sanderhoff Olsen[1], David Gill[5], Jeppe Vejlgaard Rasmussen[1,2], Fraser Taylor[6]

1. Department of Orthopaedic Surgery, Herlev and Gentofte Hospital, Hellerup, Denmark 2. University of Copenhagen, Copenhagen, Denmark 3. Barwon Centre for Orthopaedic Research and Education (B-CORE), St John of God Hospital and Deakin University, Geelong, VIC, Australia 4. Department of Orthopaedics, Barwon Health, Geelong, VIC, Australia 5. Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR), Adelaide, SA, Australia 6. Gold Coast University Hospital and Griffith University, Gold Coast, QLD, Australia

Background: Previous studies have implied that the humeral neck-shaft angle (HNSA) may influence the risk of revision after reverse total shoulder arthroplasty (rTSA).
Aim: The aim of this study was to describe variables related to rTSA; to describe trends in the use of arthroplasty systems with varying HNSA; and to analyse the association between HNSA and risk of revision following rTSA for cuff tear arthropathy (CTA) or osteoarthritis (OA).
Materials and Methods: All patients recorded in the AOANJRR and the DSR from January 1, 2008, until December 31, 2023, with primary stemmed rTSA of the five most common implants for CTA or OA were included. The HNSA was grouped in 3 categories: 135 +/- 5 degrees, 145 +/- 4 degrees and 155 +/-5 degrees. Both registries determined the cumulative percentage revision (CPR) using Kaplan-Meier estimates and hazard ratios (HR), adjusted for age, sex, and cement fixation.
Results: A total of 38,936 primary rTSAs were included from Australia and 4,192 from Denmark. Humeral components with the 145 +/-4 HNSA are increasingly used and is now the most frequently used design in Australia. During the study period, 1,362 (3.5%) arthroplasties from the Australian population and 162 (3.9%) from the Danish population underwent revision surgery. In the Australian population, the adjusted HR for revision for a HNSA of 155 /-5 compared to 145+/-4 for the first 3 months was 1.88 (95% CI 1.38 to 2.57) for patients with CTA and 1.72 (95% CI 1.27 to 2.33) for patients with OA. For 135 +/-5 compared to 145 +/-4 HNSA for patients with OA, the HR was 1.47 (95% CI 1.05 to 2.05) for the entire study period. In the Danish population, no significant differences were found between the different HNSAs.
Interpretation / Conclusion: During the study period, both registries observed an increasing use of humeral components with a 145 +/-4 HNSA. In Australia, there was a lower early risk of revision with a HNSA of 145 +/-4 compared to 155 /-5 and a lower risk of revision for the entire period for 145 +/-4 compared to 135 +/-5. In Denmark, no statistically significant differences were found. It is important to acknowledge that data related to the rTSA design were limited, and that unknown factors could contribute to the risk of revision.

SESSION 30: FREE PAPER SESSION – EXPERIMENTAL

Friday, 13 November 2026

09:00 – 09:45

Room: Ballon salen

Chairs:

Brynjólfur Y Jónsson
Department of Orthopedic Surgery, Landspitali University Hospital, Iceland

Amandus Gustafsson
Copenhagen Academy for Medical Education and Simulation (CAMES), Rigshospitalet, Denmark

33. Flap-mediated Antibiotic Delivery in Reconstructed Combined Bone and Soft Tissue Defects: A Translational Porcine Study

Josefine Slater[1,2], Maiken Stilling[1,2,3], Andreas E. Krag[1,2,4], Sara K. Tøstesen[1,2], Mads K.D. Mikkelsen[1,2], Martin McNally[5], Alex J. Ramsden[5], Louise K. Jensen[6], Mats Bue[1,2,3]

1. Aarhus Denmark Microdialysis Research (ADMIRE), Orthopaedic Research Laboratory, Aarhus University Hospital, Denmark 2. Department of Clinical Medicine, Aarhus University, Denmark 3. Department of Orthopaedic Surgery, Aarhus University Hospital, Denmark 4. Department of Plastic and Breast Surgery, Aarhus University Hospital, Denmark 5. Bone Infection Unit, Nuffield Orthopaedic Centre, Oxford University Hospital, United Kingdom 6. Department of Veterinary Animal Sciences, University of Copenhagen, Denmark

Background: Effective management of complex bone infections relies on surgical soft tissue reconstruction combined with adequate local antibiotic delivery. However, antibiotic exposure within the reconstructed bone and soft tissues remains poorly described.

Aim: To compare early postoperative drug delivery of a single dose of meropenem and vancomycin to the reconstructed defect, mediated by the muscle and fasciocutaneous flaps.

Materials and Methods: In a controlled large-animal model, combined bilateral tibial bone and soft-tissue defects were created in ten pigs and reconstructed with muscle flaps (n=8), fasciocutaneous flaps (n=8), or primary closure (n=4, controls). Both flaps underwent 60 minutes of arteriovenous clamping to simulate free flap ischaemia. Single intravenous infusions of meropenem (1000 mg) and vancomycin (2000 mg) were administered. Interstitial concentrations were obtained by microdialysis in flap or subcutaneous tissue (controls), at the tissue– bone interface, and in underlying cancellous bone. Antibiotic exposure was quantified as the area under the concentration–time curve. Plasma samples served as a systemic reference. Sampling continued for 450 minutes.

Results: For both antibiotics, no between-flap differences were observed at the tissue–bone interface or in cancellous bone. In contrast, differences were observed within flap tissues. Compared with muscle flaps, fasciocutaneous flaps achieved 1.70-fold (95% CI 1.27–2.29) and 1.29-fold (95% CI 1.06–1.58) higher exposure for meropenem and vancomycin, respectively. Primary closure resulted in the highest within soft-tissue exposure.

Interpretation / Conclusion: Early postoperative antibiotic delivery within the reconstructed surgical site was tissue- and drug-dependent. Although exposure at the tissue-bone interface and cancellous bone were comparable across flap types and primary closures, flap composition significantly influenced within-flap exposures. These findings challenge assumptions regarding flap-mediated antibiotic delivery, and the model provides a reproducible mechanism for investigating systemic and local antibiotic strategies in bone infection management.

138. Sport-specific biomechanical and neuromuscular profiles during sidecutting: A comparative study of young female handball and football players

Jesper Bencke[1], Mette K. Zebis[2]
1. SORC-C, Dept. of Orthopaedic Surgery, Hvidovre Hospital, Denmark 2. Department of Midwifery, Physiotherapy, Occupational Therapy and Psychomotor Therapy, University College Copenhagen, Denmark.

Background: Female athletes in handball and football face high ACL injury risk during landings and sidecutting, with match incidence shown to be higher in handball than football players. While biomechanical and neuromuscular factors have been implicated as risk factors, few studies have directly compared these parameters between sports with differing ACL injury rates.
Aim: This study investigated differences in isometric muscle strength, hip and knee joint biomechanics, and neuromuscular coordination during sidecutting between young female elite handball and football players.
Materials and Methods: Ninety female elite athletes (54 handball, 36 football) selected for national-level teams performed five sport-specific sidecutting maneuvers on their non-dominant leg. Kinematic and kinetic data were collected using an 8-camera Vicon system synchronized with force plates. Surface EMG recorded quadriceps and hamstring activity. Isometric strength was measured using a hand-held dynamometer. Group differences were analyzed using unpaired t-tests ($\alpha=0.05$).
Results: Football players showed greater normalized hip external rotation and extension strength. Football players approached cuts with higher velocity, while handball players executed greater direction change and lateral take-off velocity. Football players demonstrated more knee and hip flexion at initial contact, while handball players exhibited greater pelvic rotation. Handball players had larger knee and hip extension moments during early ground contact, and football players showed higher hamstring pre-activation.
Interpretation / Conclusion: Handball players display movement patterns during sidecutting—characterized by less hip external rotation strength, greater knee and hip extension moments, and lower hamstring pre-activation—that may contribute to their higher ACL injury risk compared to football players. These sport-specific biomechanical and neuromuscular differences highlight the need for tailored injury prevention strategies in female athletes.

139. The mitigating effects of exercise on neuromuscular integrity in aging

Aske Wulff Helge[1], Grith Højfeldt[1], Stig Peter Magnusson[1], Michael Kjær[1], Abigail Mackey[1]
Institute of Sports Medicine Copenhagen, Department of Orthopaedic Surgery, Copenhagen University Hospital – Bispebjerg and Frederiksberg, Copenhagen, Denmark

Background: Approximately 1 in 10 above 65 years of age, develop the clinical diagnosis of sarcopenia characterized by increased disability, frailty, and mortality. Skeletal muscle wasting seems to occur primarily through a loss of muscle fibers, motoneuron death, or disruption of the neuromuscular junction (NMJ). However, our knowledge on these processes is limited especially in terms of whole-muscle physiology and possible differences between the sexes.
Aim: The project aims to provide the first in-vivo characterization of the aging female skeletal muscle through a novel combination of magnetic resonance imaging and histology.
Materials and Methods: A total of 150 women aged 20–30 or 60–75 years will be recruited and stratified by age and physical activity level into four groups: young active, young sedentary, older active, and older sedentary individuals. Participants will attend four study visits involving assessments of body composition (DEXA), muscle morphology (DT-MRI), neuromuscular function (MUNE), and maximal voluntary contraction (MVC). A single muscle biopsy of the vastus lateralis will be obtained at rest. Biological samples will be analyzed using histochemical, transcriptomic, and proteomic techniques.
Results: The primary outcome is skeletal muscle morphology stratified by age and physical activity level. By combining DT-MRI with muscle biopsy analyses, we aim to characterize adaptations from the single-fiber level to whole-muscle architecture. Outcomes include muscle fiber size, type, and morphology, as well as architectural parameters such as pennation angle, fiber length, and physiological cross-sectional area. In addition, markers of NMJ integrity and extracellular matrix remodeling will be evaluated.
Interpretation / Conclusion: We hypothesize that lifelong physical activity attenuates age-related neuromuscular decline promoting a phenotypic shift toward a “youth-like” muscle profile in older women. Specifically, we expect preservation of muscle fiber number, morphology and whole-muscle architecture, as well as improved NMJ integrity with physical activity.

140. Patient perceived comparability and simulator sickness in a realistic simulated fitness-to-drive assessment

Jonas Ammundsen Ipsen[1,2], Jens Lauritsen [1,2]
1. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Odense, Denmark 2. Orthopaedic Research Unit, Department of Clinical Research, University of Southern Denmark, Odense, Denmark

Background: Patients want to know when they can drive after surgery. Fitness-to-drive assessments are conducted on-road, but they are resource-intensive and carry road safety risk, driving simulators may offer a safer and potentially cost-effective alternative; however, concerns regarding simulator sickness and limited perceived transferability to real-world driving clinical implementation hinders implementation in the clinic.
Aim: This study evaluated simulator sickness and perceived comparability to real-world driving in a newly developed, realistic driving simulator scenario.
Materials and Methods: Licensed and supervised drivers completed a standardized driving scenario in one of two identical simulators. The scenario included urban, rural, and highway environments and required participants to navigate traffic, comply with traffic rules, and respond to pedestrians and bicyclists while following a predefined route. After completion, participants reported perceived comparability to real-world driving (no/some/yes) and simulator sickness (none/limited/severe/terminated), including severity on a 0–10 scale. Results are presented as numbers (%) or median (interquartile range [IQR]).
Results: A total of 100 participants were included (median age 33 years [IQR 26–56]; 78% male). No simulator sickness was reported by 53%, while 43% experienced limited symptoms and 2% terminated the simulation. Median simulator sickness severity was 1 (IQR 1–3). Overall, 77% of participants perceived the simulated assessment as comparable to real-world driving.
Interpretation / Conclusion: The simulated fitness-to-drive assessment was well tolerated, with low levels of simulator sickness and high perceived comparability to real-world driving. These findings support the feasibility of driving simulation as a safer alternative to on-road assessment. Further studies should evaluate validity against on-road performance.

141. Role modelling and continuous learning in the orthopaedic theatre.

Heleen Staal[1,2], Marloes Schmitz[3,4]
1. Department of Orthopaedics Maastricht University Medical Centre, Maastricht, the Netherlands. 2. Department of Educational Development and Research, School of Health professions Education (SHE), Maastricht University, Maastricht, The Netherlands. 3. Department of Orthopaedics Radboud University Medical Centre, Nijmegen, the Netherlands. 4. Teaching and Learning Centre Radboud University Medical Centre, Nijmegen, the Netherlands.

Background: For surgical residents, role modelling— especially in the operating theatre—is a central component of learning, shaping not only technical skills but also clinical reasoning and professional behaviour. Given the rapid evolution of medical knowledge and patient care practices, orthopaedic residents must adopt a mindset of continuous learning. Do they learn these skills from their teachers in theatre?
Aim: To determine whether orthopaedic surgeons can effectively serve as role models for residents, and to identify key teaching and learning experiences, as well as the facilitators and barriers involved.
Materials and Methods: This qualitative study investigates how orthopaedic surgeons and residents interact in theatre. Video observations and semi-structured interviews identify whether the mind-set of residents and the enacted messages delivered in their workplace are coherent with the requirements needed for continuous learning.
Results: The theatre is a rich learning environment. Feedback from orthopaedic surgeons for residents is important, as are assessment questions and reflective discussions. Residents generally have a learning mindset; they prosper from a relaxed atmosphere especially when surgeons show confidence in their workmanship and when they share the responsibility towards patientcare. However, time pressure and early job take over inhibits teaching and learning, the skewed resident-surgeon power relation has a negative effect on learning and teaching.
Interpretation / Conclusion: The operating theatre is a rich and relevant workplace where residents can practice skills they need for lifelong learning. Orthopaedic surgeons support learning. They can be more open to feedback and reduce power inequality; this will the improve continuous learning process.

SESSION 31: FREE PAPER SESSION – SPORTS

Friday, 13 November 2026

11:30 – 12:15

Room: Columbine

Chairs:

Rasmus Kramer Mikkelsen
Sports Orthopedic Research Center-Copenhagen (SORC-C), Arthroscopic Center, Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Denmark

Petri Sillanpää
Pihlajalinna Tampere Hospital, Tampere, Finland

142. Low lateral trochlea index does not predict poor outcome in surgically treated patients with recurrent patella dislocation.

Ole Gade Sørensen[1], Torsten Nielsen[1], Bjørn Christensen[2], David Kocemba[1], Martin Lind[1]
1. Department of Orthopedics, Aarhus University Hospital, Denmark 2. Department of Orthopedics, Regional Hospital Horsens, Denmark

Background: The lateral trochlea index (LTI) is a radiographic parameter used to describe trochlea dysplasia and a low LTI is sometimes used as an indicator for supplemental trochleoplasty (TP) in patella stabilizing surgery.
Aim: To investigate the association between LTI and outcomes in patients with surgically treated recurrent patella dislocation. It was hypothesized that a low LTI would result in poor outcomes.
Materials and Methods: All patients in this regional cohort underwent patella stabilizing procedures from 2010 – 2024. A total of 856 patients were treated with medial patella-femoral ligament reconstruction ± tibial tubercle osteotomy. Patients with revision surgery or supplemental (TP) were excluded. Mean age was 22.5 ± 8.2 years. Average follow-up was 7.2 years. Dysplasia of the patellofemoral joint, LTI, sulcus angle, Insall-Salvati index, cartilage lesions, and tibial tuberosity-trochlear groove (TTTG) distance were evaluated by magnetic resonance imaging (MRI) prior to surgery. The patients were divided into subgroups according to the LTI. Subgroup evaluations were performed for LTI < 6 and ≥ 6 and for LTI < 12 and ≥ 12. Subjective outcomes were evaluated by Kujala Anterior Knee Pain Score and Banff Patella Instability instrument 2.0 (BPII 2.0) at final follow-up and questions regarding patella subluxation episodes, redislocation, and revision surgery.
Results: No significant statistical difference was found preoperatively between subgroups regarding age, sex, body mass index, positive apprehension, and J-sign appearance. Radiologically, no significant statistical difference was found in patella height measures. The sulcus angle and the degree of patellar and trochlea dysplasia were significantly higher in the subgroups with low LTI in both sub-analyses. No significant differences were observed between subgroups regarding the Kujala Score and BPII 2.0.
Interpretation / Conclusion: A low LTI was not associated with inferior outcomes following patellar stabilizing procedures without TP.

143. Increased Posterior Tibial Slope Is Associated with Femoropatellar Cartilage Lesions - A Matched-Pair Case-Control Study

Stephan Oehme[1,2], Jose Arteaga[3], Moses El-Kayali[1], Felix Wolf[1], Benjamin Bartek[1], Clemens Gwinner[1], Tobias Winkler[1,2,4], Tobias Jung[1]

1. Center for Musculoskeletal Surgery, Charité - Universitätsmedizin Berlin, Germany. 2. Berlin Institute of Health at Charité, Julius Wolff Institute, Universitätsmedizin Berlin, Germany. 3. Facultad de Medicina Clínica Alemana - Universidad del Desarrollo, Santiago de Chile, Chile 4. Berlin Institute of Health Center for Regenerative Therapies, Berlin Institute of Health at Charité, Universitätsmedizin Berlin, Germany.

Background: The posterior tibial slope (PTS) influences knee biomechanics and load distribution, but its role in the development of cartilage lesions remains incompletely understood.
Aim: To investigate whether medial posterior tibial slope (MPTS) is associated with cartilage lesions in different anatomical compartments of the knee.
Materials and Methods: This retrospective matched case-control study included patients undergoing spheroid-based matrix-induced autologous chondrocyte implantation (MACI) for full-thickness cartilage defects (ICRS ≥ 3C). From 501 screened patients, 280 were included after applying radiographic criteria and matched 1:1 by age and sex to 280 controls without prior knee pathology. The MACI cohort was subdivided by defect location. MPTS was measured on lateral radiographs by three blinded raters. Group comparisons were performed using unpaired t-tests with effect sizes (Cohen's d). Subgroup analyses were conducted using a many-to-one matching approach to increase statistical power in location-specific comparisons. Inter-rater reliability was assessed using ICC.
Results: A total of 280 patients (mean age 30.2 ± 8.9 years; 53.6% male) and 280 matched controls were analysed. Inter-rater reliability was excellent (ICC = 0.921). Mean MPTS was significantly higher in the MACI group compared with controls (9.73° ± 2.93° vs. 8.92° ± 2.85°, $p < 0.001$; $d = 0.278$). Subgroup analysis showed that this difference was driven by the patellofemoral compartment (9.92° ± 2.90° vs. 8.70° ± 3.05°, $p < 0.001$; $d = 0.412$), whereas no difference was observed for femoral condylar lesions ($p = 0.386$). Location-specific analyses showed significantly higher MPTS in retropatellar ($p = 0.009$) and trochlear lesions ($p = 0.012$), but not in medial or lateral femoral condyles.
Interpretation / Conclusion: Increased MPTS is associated with cartilage lesions in the patellofemoral compartment but not in the femoral condyles, indicating a compartment-specific biomechanical effect. Identifying MPTS as a contributing risk factor may help to identify patient subgroups at increased risk and enable earlier, more targeted interventions.

144. Follow-up of 55 young patients (68 joints) with recurrent non-traumatic anterior sternoclavicular instability surgically treated with a Discus Preserving and Epiphyseal-Sparing Technique

Anna Hørby Normann Rasmussen[1], Martin Wyman Rathcke [1], Michael Rindom Krogsgaard [1], Kristoffer Weisskirchner Barfod [1]
1. Department of Orthopedic Surgery, Copenhagen University Hospital Bispebjerg, Copenhagen, Denmark

Background: Non-traumatic anterior sternoclavicular joint (SCJ) instability is a rare condition primarily affecting young patients. When it causes functional impairment, surgical stabilization is indicated, preferably without compromising the medial clavicular physis or articular disc. A disc-preserving, epiphyseal-sparing technique using an autologous hamstring tendon graft has been developed at our institution.
Aim: This study evaluated long-term outcomes using patient-reported outcome measures (PROMs), complications, and patient-reported satisfaction and function.
Materials and Methods: Consecutive patients <30 years with non-traumatic recurrent anterior SCJ instability were included. Dislocations of the medial clavicle occurred during combined abduction, extension and external rotation of the shoulder, and was objectively confirmed at clinical examination. The condition reduced their functional ability. DASH and Oxford Instability Score (OIS) were collected preoperatively and at 1-, 2- and 5-years (y) follow-up. At a cross-sectional follow-up in March-April 2026 patients were asked to complete an additional questionnaire exploring satisfaction and participation in work and sports. Complications and reoperations were recorded from the medical files.
Results: From 2010 to 2025, 68 joints in 55 patients were operated. Follow-up data were available for 43 joints at baseline, 33 at 1y, 28 at 2y, and 25 at 5y. No infections or bleeding occurred. Mean OIS improved from 33 (18–60) at baseline to 28, 25, and 24 at 1-, 2-, and 5-year follow-up. DASH improved from 24 (1–55) to 13, 9, and 11. Nine cases (13%) required reoperation due to recurrent instability. At cross-sectional follow-up (n=35), mean OIS was 20 (12–55) and DASH 9 (0–57). Overall, 71% reported resolution of symptoms and would undergo surgery again; 65% had no work-related symptoms and 59% no sport-related symptoms. Improvements exceeded the minimal clinically important difference (7 for OIS, 7.5 for DASH).
Interpretation / Conclusion: Long-term outcomes showed a satisfaction rate of 71%, reoperation rate of 13%, and no major complications. There were statistically significant and clinically relevant improvements in PROM-scores.

145. The Effects of Everolimus and Resistance Training on Bone and Muscle Health in 60–75-year-old women (StrongBone)

Maria Østergaad Madsen[1], Grith Højfeldt[1], Anna Sofie Elkjaer[2], Søren Gam[3], Per Aagaard[3], Lars Folkestad[2], Abbas Jafari[4], Niklas Rye Jørgensen[5], Florence Figeeac[2], Pia Eiken[6], Michael Kjær[1], Moustapha Kassem[2], Abigail L. Mackey[1]

1. Institute of Sports Medicine Copenhagen, Department of Orthopaedic Surgery, Copenhagen University Hospital – Bispebjerg and Frederiksberg, Copenhagen, Denmark 2. Molecular Endocrinology Department, KMEB, Department of endocrinology, Odense University Hospital, Odense, Denmark 3. Department of Sports Science and Clinical Biomechanics, University of Southern Denmark 4. Department of Cellular and Molecular Medicine, University of Copenhagen 5. Centre of Diagnostic Investigation, Rigshospitalet and Glostrup Hospital 6. Department of Endocrinology, Copenhagen University Hospital –Bispebjerg and Frederiksberg, Copenhagen, Denmark

Background: Osteoporosis and sarcopenia increase with aging, raising the risk of fragility fractures, leading to increased morbidity and early mortality. Current treatments mainly target bone loss and often overlook muscle function and underlying ageing mechanisms. Rapamycin inhibits mTOR, a central regulator of cellular processes. In preclinical studies, rapamycin has shown potential to delay ageing, reduce cellular senescence, improve bone metabolism, indicating a therapeutic potential. Among non-pharmacological agents, resistance training is a well-established approach to preserve both bone and muscle health. However, the combined effects of pharmacological and exercise interventions on the musculoskeletal system remain unclear.
Aim: The aim is to investigate if Rapamycin's analog (Everolimus®), resistance training, or their combination, enhances bone formation and muscle functions in elderly women compared to placebo controls.
Materials and Methods: StrongBone is a 24-week randomized, multicenter, placebo-controlled, double-blinded study. A total of 148 healthy women aged 60-75 years will be randomized to one of four groups: Everolimus® (rapamycin analogue), placebo, Everolimus® plus resistance training, or placebo plus resistance training. The resistance training consists of supervised, machine-based progressive resistance training performed three times weekly. Muscle biopsy sampling, magnetic resonance imaging (MRI) of the thigh and deuterium oxide (D_2O) tracer dosing will be performed only at the Bispebjerg (BBH) site, which enrolls 72 of the 148 participants. EU CT: 2024-520372-10-00 ClincalTrials.gov, ID: NCT 07191353 Registered 9 September 2025.
Results: The primary outcome is changes in the circulating bone formation marker Procollagen Type 1 N-terminal propeptide P1NP. The secondary outcomes are skeletal muscle hypertrophy measured by MRI, muscle and bone protein synthesis rates measured using a D2O tracer, muscle morphological and molecular analyses and muscle strength.
Interpretation / Conclusion: These outcomes will clarify the combined effects of pharmacological and physical interventions on the ageing musculoskeletal system, a step toward reducing frailty in older women.

146. Comparing the Effects of Hölmich Protocol Exercise Therapy and Joint Mobilization Training on Pain, Balance, Functional Performance, and Muscle Activity in Soccer Players with Athletic Groin Pain

Farzad Jafarinazhad[1], Nilüfer Cerbezer[2], Elif Tuğçe Çil Sertöz[1]
Yeditepe University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, İstanbul-Türkiye

Background: Athletic groin pain is a common condition in soccer players and is associated with impaired performance, prolonged rehabilitation, and high recurrence rates. Exercise-based rehabilitation programs and manual therapy approaches are frequently used; however, comparative evidence regarding their effects on functional performance and neuromuscular activation remains limited.
Aim: This study aimed to compare the effects of Hölmich protocol exercise therapy (HT) and joint mobilization training (JMT) on pain intensity, dynamic balance, functional performance, and muscle activation onset in soccer players with athletic groin pain.
Materials and Methods: Twenty-seven male amateur soccer players (18–35 years) with athletic groin pain were randomly allocated to the HT group (n = 14) or the JMT group (n = 13). Both interventions were applied three times per week for 12 weeks. Pain intensity was assessed using the Visual Analog Scale (VAS). Dynamic balance was evaluated with the Y Balance Test, functional performance with the Agility T-Test and Edgren Side Step Test, and muscle activation onset of trunk and hip muscles using surface electromyography during a lateral cutting task.
Results: Both groups demonstrated significant within-group improvements in pain, balance, and functional performance ($p < 0.001$). Between-group analyses revealed significantly greater improvements in the HT group for pain reduction, agility, side-step performance, and dynamic balance ($p < 0.01$). Additionally, the HT group showed significantly earlier activation of the rectus abdominis, adductor longus, and gluteus medius muscles compared with the JMT group.
Interpretation / Conclusion: Hölmich protocol was more effective than joint mobilization training in reducing pain and improving functional performance and neuromuscular activation patterns in soccer players with athletic groin pain. Strength- and neuromuscular-based rehabilitation approaches should be prioritized in this population.

SESSION 32: FREE PAPER SESSION – TRAUMA

Friday, 13 November 2026

11:30 – 12:15

Room: Harlekin

Chairs:

Olof Wolf
Department of Orthopaedics and Hand Surgery, Uppsala University Hospital, Sweden

Christian Fugl Hansen
Department of Orthopaedic Surgery, Bispebjerg and Frederiksberg Copenhagen University Hospital, Denmark

147. Bone tunnel suture fixation of simple stable olecranon fractures - a 5-year Danish multicenter retrospective study

Birgir Thomsen[1], Pelle Baggesgaard Petersen [1,3], Yousef Ahmad Barakji [1], Jonas Askø Andersen [1,2]
1. Department of Orthopedic Surgery, North Zealand Hospital, Denmark 2. Department of Clinical Medicine, University of Copenhagen, Denmark 3. Department of Orthopedic Surgery, Copenhagen University Hospital - Herlev and Gentofte, Denmark

Background: The gold standard for Mayo type 2A olecranon fractures is Tension Band Wiring (TBW), but it is associated with high complication rates. The novel Bone Tunnel Suture Fixation (BTSF) technique utilizes high-tensile sutures instead of metal wires, offering a promising alternative to eliminate hardware-related complications.
Aim: This study aimed to compare the complication and reoperation rates between TBW and the novel BTSF technique.
Materials and Methods: This study was designed as a retrospective multicenter comparative cohort study. The population consisted of adult patients who were operated with TBW or BTSF technique at North Zealand Hospital or Herlev Gentofte Hospital between the 1st of January 2018 and the 31st of December 2023 Primary endpoints were reoperation rates; secondary endpoints included specific complications and surgical duration.
Results: A total of 68 patients (44 females) with a mean age of 61.1 ± 17.3 were included. Patients received either TBW (n=35;) or BTSF (n=33). Baseline characteristics were comparable between the groups except for a significantly higher proportion of females in the BTSF group (p=0.0024). The median follow-up for the entire population was 33.5 months (Q1-Q3 13.7-58.2). The reoperation rate was significantly lower in the BTSF group (6.1%) compared to the TBW group (45.7%) ($p < 0.001$). Implant irritation occurred in 37.1% of TBW patients vs. 3.0% of BTSF patients ($p < 0.001$). Surgical time was significantly shorter for BTSF (mean 60.4 ± 17.7 min) compared to TBW (mean 86.1 ± 21.9 min) ($p < 0.001$). No statistically significant differences were observed between groups regarding infection, ulnar neuropathy, heterotopic ossification, or nonunion.
Interpretation / Conclusion: BTSF demonstrated a superior safety profile with significantly fewer reoperations, fewer complications, and a shorter surgical time compared to TBW, supporting its use as a viable alternative for Mayo type 2A olecranon fractures.

148. The Effect of Antidepressants and Benzodiazepines in an Aging Population in Recovery After a Fracture

Alva Mårtensson[1], Helmi-Sisko Pyrhönen [1,2], Linnea Malmgren [1,3], Cecilia Rogmark [1,2]
1. Faculty of Medicine, Lund University, Sweden; 2. Department of Orthopaedics, Skåne University Hospital, Malmö, Sweden; 3. Department of Geriatrics, Skåne University Hospital, Malmö, Sweden.

Background: Fall risk-increasing drugs (FRIDs), including antidepressants and benzodiazepines, put frail individuals at risk of injuries and fractures. The prescription rate of antidepressants has increased the last decade. Although the impact of antidepressants and benzodiazepines as FRIDs are known, how the drugs affect the outcome after a fall-related fracture is lesser known.
Aim: The aim is to investigate the use of antidepressants and benzodiazepines among patients ≥65 years admitted due to fall-related fractures. Secondly to analyse how the drugs affect the outcome after fracture, regarding new falls, rehospitalization and mortality.
Materials and Methods: In an observational study, 1108 patients aged ≥65 years, admitted to orthopaedic wards at Skane University Hospital Malmö, were prospectively included. Baseline data and further events during a 1-year follow-up were drawn from medical records. Univariate and multivariate logistic regression analysis were used for antidepressants and benzodiazepines to measure Odds Ratio (OR) for the outcomes, adjusted for eventual confounders in two steps.
Results: 340 patients (31%) used antidepressants, and 80 (7.2%) benzodiazepines. Patients who fell again had more often antidepressant, and there was a higher share of both antidepressants and benzodiazepines for those who died during follow-up. Antidepressants were associated with new falls (OR 1.5 CI 1.1 –2.1, p=0.009) and mortality (OR 1.5 CI 1.1 - 2.1, p=0.02), adjusted for dementia, and age and BMI, respectively. Benzodiazepines were associated with less rehospitalization (OR 0.5 CI 0.3 – 0.9, p=0,03) and mortality (OR 2.0 CI 1.2 – 3.4, p=0.009) adjusting for comorbidities, and age and BMI, respectively.
Interpretation / Conclusion: One third of elderly with a fall-related fractures were on antidepressants, while benzodiazepines were uncommon. Antidepressants were associated with new falls. Benzodiazepine usage was associated with decreased odds of rehospitalization. Use of antidepressants or benzodiazepines was associated with increased odds of dying within one year after fracture.

149. Potential Impact of Mandatory Bicycle Helmet Legislation: A Retrospective Study with National Extrapolation

Jonas Ammundsen Ipsen[1,2], Jens Lauritsen [1,2], Harry Lahrmann [3]
1. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Odense, Denmark 2. Orthopaedic Research Unit, Department of Clinical Research, University of Southern Denmark, Odense, Denmark 3. Traffic Research Group, BUILD, Aalborg University, Aalborg, Denmark

Background: Head injuries are a frequent and serious consequence of bicycle-related incidents but are largely preventable with helmet use. In Denmark, helmet use is not mandatory, and approximately 50% of cyclists wear a helmet. Quantifying the potential impact of mandatory helmet legislation may inform injury prevention policy.
Aim: This study aimed to estimate the number of preventable minor and severe head injuries under a scenario of mandatory helmet use.
Materials and Methods: We conducted a retrospective cohort study using emergency department data from Odense and Svendborg University Hospitals (OUH), where helmet use is routinely recorded. Cyclists treated for minor or severe head injuries following bicycle-related incidents between 2020 and 2024 were included. The impact of mandatory helmet in Denmark was extrapolated from OUHs registration of bicycle incidents assuming a post-legislation helmet use rate of 92%, based on evidence from New Zealand. A switch fraction was applied to reflect compliance. Relative risk reductions of 48% for minor injuries and 60% for severe head injuries were derived from meta-analyses and used to estimate the number of potentially preventable injuries.
Results: At OUH a total of 2,393 cyclists were treated for head injuries, of whom 1,366 (57%) were not wearing a helmet. The mean age was 38 years (SD 21), and 57% were male. Severe head injuries occurred to 511 cyclists, of which 275 (53%) did not wear a helmet. The extrapolation from OUH registrations suggested that up to 7,160 minor and 1,802 severe head injuries could have been prevented in Denmark within the period had helmet use been mandatory.
Interpretation / Conclusion: Mandatory helmet use has the potential to substantially reduce both minor and severe head injuries among cyclists and relive pressure on the emergency room. These findings support the implementation of helmet legislation as an effective strategy for injury prevention in cycling populations.

150. Fall Injuries in Children aged 4-14 years

Lakshmi Subramaniam[2], Christian Wong[2], Christian Færgemann[2]
1. Department of Orthopaedics, Odense University Hospital, Denmark; 2. Accident Analysis Group, Odense University Hospital, Denmark

Background: Falls are the leading cause of injury-related emergency department (ED) visits in children, yet determinants of clinically significant injury in school-aged children remain poorly described.
Aim: To examine age- and sex-specific fall mechanisms and identify predictors of non-superficial injury in children aged 4–14 years.
Materials and Methods: Population-based cohort study including all ED contacts for fall-related injuries among children aged 4–14 years in Odense Municipality (2017–2025). Data were obtained from a prospective injury registry. Variables included fall mechanism, fall height (≤1 m vs >1 m), injury type, and body region. Clinically significant injury was defined as non-superficial injury. Multivariable logistic regression identified independent predictors.
Results: A total of 13,584 injury events were included (55.4% boys). Same-level falls were most common (47.4%) and more frequent in older children (57.9% vs 38.0%, p<0.001), while younger children more often fell from playground equipment and furniture. Most injuries (83–90%) resulted from falls ≤1 meter. Fractures occurred in 28.1%, predominantly in the upper extremity (51.1%). In multivariable analysis, fall height >1 meter (adjusted OR 1.45, 95% CI 1.27–1.66), playground equipment (OR 1.70, 1.49– 1.94), trampoline use (OR 1.21, 1.04–1.40), and wheeled activities (OR 1.21, 1.06–1.39) were associated with non-superficial injury. Female sex was associated with lower risk (OR 0.89, 0.82– 0.96), while age was not independently associated.
Interpretation / Conclusion: Most pediatric fall injuries occur from low heights but still frequently result in fractures. Injury severity is driven by mechanism and activity context rather than height alone. Prevention strategies should target specific high-risk environments such as playgrounds, trampolines, and wheeled activities.

151. Benchmarking of Pediatric Fracture Care

Topi Laaksonen Yrjänä Nietosvaara[1]
Department of Pediatric Orthopedics and Traumatology, New Children's Hospital, Helsinki University Hospital, Finland

Background: There is no universal consensus on evaluating the quality of pediatric fracture care. While U.S. News ranks hospitals based on surgical timing and procedural benchmarks, additional metrics such as complication rates, reoperations, and patient-reported outcomes could provide a more comprehensive assessment. This study evaluates pediatric fracture care outcomes at a Level I trauma center, emphasizing standardization and transparency in benchmarking.
Aim: The study evaluates the quality of pediatric fracture care over a five-year period in a Level I pediatric trauma center. By applying U.S. News criteria alongside complication and outcomes, it aims to drive progress in pediatric fracture care reporting.
Materials and Methods: This retrospective study reviewed all fractures diagnosed at HUS New Children's Hospital, Helsinki from 2018 to 2022. U.S. News criteria were applied to completely dorsally displaced supracondylar humerus (Gartland III) fractures, femoral shaft fractures, and displaced forearm fractures to evaluate timeliness, method of treatment, and anesthesia use. Modified Clavien-Dindo-Sink system was used in complex fractures. Permanent iatrogenic nerve injuries and deep infections were registered in all fractures.
Results: 10144 fractures were diagnosed, of which 17.8% were treated in operative room. Surgery started within 18 hours in 173 (87%) of Gartland III and 108 (79%) of femoral shaft fractures. Open reduction rate was 24% in Garland III fractures. Most (60%) of displaced forearm fractures were managed without general anesthesia. The overall complication rate for Garland III and femoral shaft fractures was 12,9%, unplanned return to surgery occurred in 2.2% respectively. Permanent iatrogenic nerve injuries and deep infections were rare (0.04% and 0.3%) in all fractures.
Interpretation / Conclusion: Pediatric fracture care at our institution meets U.S. News benchmarks for timeliness and procedural efficiency. Incorporating broader metrics such as complications, outcomes, and satisfaction offers a more complete assessment of care quality.

SESSION 33: FREE PAPER SESSION – KNEE ARTHROPLASTY

Friday, 13 November 2026

11:30 – 12:15

Room: Blomster salen

Chairs:

Maziar Mohaddes
Department of Orthopaedics, Institute of Clinical Science, The Sahlgrenska Academy, University of Gothenburg, Sweden

Oddrún Danielsen
Department of Orthopaedic Surgery and Traumatology, Odense University Hospital, Odense, Denmark

152. Bacteria-Specific Mortality After Revision for Prosthetic Joint Infection: A Nationwide Cohort Study of 2455 hip and knee revisions

Alexander Bech Lindgaard[1], Laurens Manning [2], Joshua S Davis [3], Jeppe Lange [4,5], Nicolai K Kristensen [5,6]
1. Department of Orthopedics, Randers Regional Hospital, Denmark 2. Department of Infectious Diseases, Fiona Stanley Hospital, WA, Australia, 3. School of Medicine and Public Health, University of Newcastle, Newcastle, NSW, Australia 4. Department of Orthopedics, Horsens Regional Hospital, Denmark 5. Department of Clinical Medicine, Aarhus University, Denmark 6. Center of Planned Surgery, Silkeborg Regional Hospital, Denmark

Background: Periprosthetic joint infection (PJI) following total hip and knee arthroplasty (THA and TKA) is a serious complication which is associated with increased mortality.
Aim: Using a large nationwide cohort, we assessed the mortality risk according to the bacterial pathogens identified at the time of the first PJI revision.
Materials and Methods: Data were obtained from the Danish Hip and Knee Arthroplasty Register and the Danish Microbiology Database. We included all pathogens isolated from first-time hip and knee revisions for infection between January 1, 2010, and November 9, 2023. Mortality risk was calculated using adjusted hazard ratios (HR) with 95% confidence intervals (CI) in time to event analysis and Kaplan-Meier methodology. Being the most common pathogen in the cohort(29%), Staphylococcus aureus served as the reference for HR calculations. Measured confounding was addressed using inverse probability of treatment weighting (IPTW) based on propensity scores. We identified a total of 2,455 revisions for hip and knee PJI; 63.6% following THA and 36.4% following TKA. The mean follow-up time was 7.1 years.
Results: Culture-negative infections were identified in 12% of the PJI revisions, while 24% of the PJIs were polymicrobial. Compared with S. aureus, the group of aerobic Gram-negative bacteria were associated with increased mortality (HR 1.44, 95% CI 1.05–1.98). Among individual pathogens Escherichia coli (n=53) was associated with a higher mortality risk (HR 1.63, 95% CI 1.03–2.58), and Klebsiella species (n=10) showed the highest risk (HR 2.82, 95% CI 1.20–6.65). In contrast, Cutibacterium acnes was associated with lower mortality (HR 0.21, 95% CI 0.07–0.67). The 10-year adjusted cumulative mortality for aerobic Gram negative bacteria was 55.7%(CI: 42.3 to 66) compared to 44.5%(CI: 38.9 to 49.5) for S. aureus.
Interpretation / Conclusion: The infecting pathogen causing PJI appears to impact overall mortality, with aerobic Gram negatives conferring the highest risk of mortality and Cutibacterium acnes, the lowest. Consequently, there should be an increased focus on treatment strategies and preventive measures targeting aerobic Gram negative bacteria in PJIs.

153. Incidence of Periprosthetic Joint Infection and Microbial Profiles After Knee Arthroplasty in patients with vs. without obesity: A Nationwide Register-Based Study from Denmark

Saber Muthanna Aljuboori[1,2,4], Espen Jimenez-Solem [2,3], Henrik Calum [6], Robin Christensen [2,5], Søren Overgaard [1,4]

1. Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital, Bispebjerg and Frederiksberg, Copenhagen, Denmark; 2. Section for Biostatistics and Evidence-Based Research, the Parker Institute, Copenhagen University Hospital, Bispebjerg and Frederiksberg, Copenhagen, Denmark; 3. Copenhagen Phase IV unit (Phase4CPH), Department of Clinical Pharmacology and Center of Clinical Research and Prevention at Copenhagen University Hospital, Bispebjerg and Frederiksberg; 4. University of Copenhagen, Department of Clinical Medicine; 5. Research Unit of Rheumatology, Department of Clinical Research, University of Southern Denmark, Odense University Hospital, Denmark; 6. Department of Clinical Microbiology, Hvidovre Hospital, Copenhagen University Hospital, Copenhagen, Denmark

Background: After a primary knee arthroplasty (KA), patients with obesity may be more likely to experience a periprosthetic joint infection (PJI)

Aim: 1) To compare the 2-year incidence of revision due to PJI after primary KA in patients with/without obesity. 2) To compare the 2-year incidence of all-cause revision between patients with/without obesity and 3) the microbial profiles in early (≤90 days) and late (91–730 days) PJI

Materials and Methods: This nationwide, register-based cohort study included patients undergoing primary total or unicompartmental KA for osteoarthritis in Denmark (2011-2023). Patients were stratified by body mass index (BMI), with obesity defined as BMI ≥ 30 kg/m2. Cox proportional hazards models estimated hazard ratios (HRs) with corresponding 95% confidence intervals (95%CIs) for PJI and all-cause revision within 2 years. Analyses included crude and propensity-score adjusted models based on health and socioeconomic data. Microbial profiles were compared using absolute risk difference (ARD) in the early and late postoperative periods

Results: Among 111,117 eligible patients; 41,306 had obesity (mean BMI 34.6) and 59,993 did not (mean BMI 26.1). Patients with obesity were slightly younger with higher use of glucose-lowering medication. Patients with obesity had a higher risk of PJI revision (482 [1.2%] vs. 559 [0.9%]; crude HR: 1.25 [1.11 to 1.42], and propensity adjusted HR 1.30, 95% CI 1.14–1.48). There was no difference in the adjusted risk of all-cause revision (1494 [3.6%] vs 1893 [3.2%]; HR 1.05, 95% CI 0.98–1.13). Within 90 days, patients with obesity had more polymicrobial infections (62 [18.5%] vs. 43 [11.3%]; ARD 7.2%, 95% CI 2.0% to 12.5%) and more non-staphylococcal gram-positive organisms (69 [21%] vs. 54 [14%]; ARD 6.3%, 95% CI 0.8% to 12%)

Interpretation / Conclusion: Obesity was associated with an increased 2-year risk of PJI after arthroplasty; however, the risk of all-cause revision was comparable to that in patients without obesity. Within 90 days, patients with obesity exhibited a higher incidence of polymicrobial infections and non-staphylococcal gram-positive organisms. These findings may have implications for antibiotic prophylaxis and empirical treatment strategies in this patient population

154. Impact of preoperative flexion contracture and limited knee flexion on patient reported outcomes after medial unicompartmental knee arthroplasty – a study of 1199 knees.

Anders Troelsen[1,2], Tomofumi Kinoshita [1], Kristine Ifigenia Bunyoz [1], Kristian R. L. Mortensen [1], Christian Bredgaard Jensen [1], Christian Skovgaard Nielsen [1,2], Kirill Gromov [1,2]
1. Department of Orthopaedic Surgery, Copenhagen University Hospital Hvidovre, Copenhagen, Denmark. 2. Department of Clinical Medicine, Copenhagen University, Copenhagen, Denmark.

Background: Contemporary indications for medial UKA allows up to 50 % usage. However, limitations in preoperative ROM, including both flexion contracture and limited knee flexion, in patients with AMOA continues to be a matter of concern for surgeons and therefore a challenge to patient selection.
Aim: This study aimed to clarify whether preoperative flexion contracture (FC) and limited knee flexion in patients with anteromedial osteoarthritis (AMOA) are related to postoperative outcomes in mobile-bearing medial unicompartmental knee arthroplasty (UKA).
Materials and Methods: This retrospective study evaluated 1,199 knees underwent mobile-bearing medial UKA. Preoperative maximum extension and flexion angles, and the Oxford Knee Score (OKS) and Forgotten Joint Score-12 (FJS) recorded preoperatively and at 3 months, 1 and 2 years, were assessed. Patients were categorized by preoperative extension (no FC, <10°, ≥10°) and flexion angles (<120°, ≥120°). Pairwise comparisons of changes in OKS and FJS were performed using a general linear model with Bonferroni-adjusted post hoc tests. Adjusted mean differences were calculated while controlling for age, sex, body mass index, and preoperative scores.
Results: Preoperatively, 85.1% of patients had full extension, 11.8% had <10° FC, and 3.1% had ≥10° FC. Regarding flexion, 40.3% had <120°, while 59.7% had ≥120°. The <10° FC group showed greater OKS and FJS improvement at 1 year compared with the ≥10° FC group ($p = 0.014$ and 0.033). The <120° flexion group demonstrated greater FJS improvement at 1 year compared with those with ≥120° ($p = 0.045$). No significant differences were observed at 2 years for either classification.
Interpretation / Conclusion: Mild preoperative flexion contracture and mild-to-moderate limited knee flexion were not associated with inferior outcomes. Patients with more pronounced FC were found to recover slower but still achieve great benefit from surgery. In patients with AMOA, FC and limited flexion should not be considered contraindications.

155. Functional outcomes after microvascular free-flap coverage in two-stage revision for knee periprosthetic joint infection: a comparative cohort study

Elva Arinbjarnar[1], Nizar Hamrouni[2], Lisa T. Jensen[2], Peter S. Andersen[2], Peter V. Vester-Glowinski[2], Anders B. El-Galaly[1], Anders Odgaard[1,3]

1. Department of Orthopedic Surgery, Center of Head, Neck and Orthopedics, University Hospital of Copenhagen, Rigshospitalet, Inge Lehmanns Vej 8, 2100 Copenhagen, Denmark 2. Department of Plastic Surgery and Burns Treatment, Center of Head, Neck and Orthopedics, University Hospital of Copenhagen, Rigshospitalet, Inge Lehmanns Vej 8, 2100 Copenhagen, Denmark 3. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark

Background: Periprosthetic joint infection (PJI) after total knee arthroplasty is a severe complication often requiring two-stage revision. Successful reconstruction relies on adequate soft-tissue coverage, but extensive compromise may prevent primary closure and threaten limb salvage. Microvascular free-flap coverage (FFC) can restore soft-tissue integrity in such cases, yet existing literature focuses mainly on flap survival and infection control, while functional outcomes after FFC in knee PJI remain poorly described. It also remains unclear whether the flap procedure itself influences functional results.

Aim: To evaluate functional outcomes after two-stage revision for knee PJI requiring FFC and to compare these outcomes with a cohort undergoing similar two-stage revision without flap reconstruction.

Materials and Methods: This retrospective cohort study included patients undergoing two-stage revision for chronic knee PJI at a tertiary referral centre between 2007 and 2024. Patients receiving FFC were compared with patients treated without flap reconstruction. The primary outcome was the Oxford Knee Score (OKS). Secondary outcomes included EQ-5D-5L, EQ-VAS, knee range of motion, and infection-related outcomes including revision, reinfection, arthrodesis and limb salvage.

Results: Ninety-nine patients were included (FFC n=22; non-FFC n=77). Complete patient-reported outcome data was available for 12 of 17 and 26 of 37 surviving patients, respectively. Despite more severe soft-tissue compromise in the FFC group, functional outcomes were comparable, with similar mean OKS (24.1 vs 26.3), EQ-5D-5L index values (0.6 vs 0.6), EQ-VAS scores, and knee range of motion. Five-year cumulative incidence of revision was 30.1% in the FFC group and 34.7% in the non-FFC group, while reinfection occurred in 25.4% and 20.1%, respectively. Amputation occurred in 9% and 10% of patients, corresponding to limb-salvage rates of 91% and 90%.

Interpretation / Conclusion: FFC enabled limb preservation in knee PJI with severe soft-tissue defects without compromising functional outcomes, revision, reinfection or limb-salvage rates. Supporting early referral of patients with soft-tissue defects or threatened amputation to centres with microsurgical expertise.

156. Computer-assisted surgery does not improve implant survival in revision total knee arthroplasty compared to the conventional technique.

Triine E Alling[1], Marrigje F Conteh-Meijer[1], Alexander L Boerboom[1], Martin Stevens[1,2], Inge H F Reininga[3]
1. Department of Orthopaedics, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands; 2. Division of Orthopaedics at Campus Pius-Hospital, School of Medicine and Health Sciences, Carl von Ossietzky Universität Oldenburg, Oldenburg, Germany; 3. Department of Trauma Surgery, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands

Background: Total knee arthroplasty (TKA) is among the most common and effective surgical interventions for end-stage osteoarthritis of the knee joint. As the number of TKAs is expected to rise, so is the need for revision total knee arthroplasty (rTKA). Neutral alignment of the prosthesis is one of the most important requirements for a favourable outcome in revision surgery. Computer-assisted surgery (CAS) has been developed to improve prosthesis alignment. The additional value of CAS in rTKA is yet to be evaluated in the scope of a prosthesis survival analysis.
Aim: To examine the differences in prosthesis survival rates following rTKA using CAS compared to a conventional technique.
Materials and Methods: A retrospective comparative study of 85 rTKAS divided into an intervention (CAS-rTKA) and control group (CON-rTKA). Kaplan-Meier survival analyses were performed to assess the survival of the prostheses in the two study groups at 5 and 10 years. Cox regression analysis was performed to study differences between the groups.
Results: The use of CAS during rTKA did not lead to a significantly better prosthesis survival compared to the CON-rTKA group (P=0.96; hazard ratio (HR) = 1.03, 95% CI: 0.36-2.94). The prosthesis survival in the CAS-rTKA group was 85% at 5-year follow-up and 80% at 10-year follow-up. In the CAS-rTKA group there were 12 revisions in total leading to an overall survival of 81%. The prosthesis survival in the CON-rTKA group was 87% at 5-year follow-up, and 82% at 10-year follow-up. In the CON-rTKA group there were 5 revisions in total leading to a survival of 78%.
Interpretation / Conclusion: Based on the results of this study it can be concluded that there is no difference in prosthesis survival by using CAS compared to a conventional technique in rTKA at a 5- and 10-year follow-up.

SESSION 34: FREE PAPER SESSION – KNEE ARTHROPLASTY

Friday, 13 November 2026

13:15 – 14:00

Room: Columbine

Chairs:

Nils Hailer
Department of Surgical Sciences, Uppsala University, Uppsala, Sweden; Swedish Arthroplasty Register, Uppsala University Hospital, Sweden

Lasse Enkebølle Rasmussen
Department of Orthopaedic Surgery, Lillebaelt Hospital, Denmark

157. Effect of physiotherapeutic interventions on reduction of chronic pain after primary total hip and knee arthroplasty. A systematic review and meta-analysis

Atena Saito[1], Anders Peder Højer Karlsen[1,2], Andreas Creutzburg[3], Morten Tange Kristensen[2,4], Søren Overgaard[2,5], Jens Laigaard[2,5]

1. Department of Anesthesia and Intensive Care, Copenhagen University Hospital Bispebjerg and Frederiksberg, Copenhagen, Denmark 2. Department of Anaesthesiology, Centre of Head and Orthopaedics, Rigshospitalet, Copenhagen University Hospital, Copenhagen, Denmark 3. Department of Physical and Occupational Therapy, Copenhagen University Hospital, Bispebjerg and Frederiksberg, Copenhagen, Denmark 4. Department of Clinical Medicine, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark 5. Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital, Bispebjerg and Frederiksberg, Copenhagen, Denmark.

Background: Many randomised trials have evaluated physiotherapeutic interventions in patients undergoing total hip and knee arthroplasty (THA and TKA), yet the effect on chronic pain remains uncertain

Aim: To investigate the effect of perioperative physiotherapeutic interventions, compared to no intervention, on pain intensity at 3 to 24 months after THA and TKA

Materials and Methods: We searched MEDLINE, CENTRAL, Embase, and PEDro up to January 2026 for randomised trials investigating pre- and post-surgical physiotherapeutic interventions in THA and TKA patients. We included trials assessing an intervention added to routine care, versus routine care alone, if they assessed pain outcomes at 3-24 months postoperatively. The primary outcome was pain intensity (0-100 mm scale), with a minimal important difference of 10 mm. Two independent authors screened, extracted data, and assessed risk of bias using RoB2. We performed meta-analyses, trial sequential analyses, and worst-best and best-worst case analyses following PRISMA guidelines

Results: We included 80 trials investigating various interventions and were able to conduct meta-analyses of six categories of interventions: combined exercises, education and exercise, electrical stimulation, strength training, psychological support, and mechanical vibration therapy. All analyses were limited by high risk of bias, missing outcome data, and trial heterogeneity. Electrical stimulation was the only intervention where the estimate exceeded the minimal important difference (-12 mm; 95% CI -21 to -2; I2 81%, 3 trials), but this could not be confirmed in trial sequential analysis due to extensive statistical heterogeneity. Strength training and psychological support interventions gave statistically significant but clinically unimportant reductions in chronic pain intensity. For all analyses, the certainty of evidence was low or very low

Interpretation / Conclusion: Very low certainty evidence suggests that electrical stimulation interventions, as compared to no intervention, decrease pain intensity at 3 to 24 months after THA and TKA. Low to very low certainty evidence suggests that no other physiotherapeutic intervention, compared to no intervention, have meaningful effects on chronic pain outcomes

158. The risk of revision using tourniquet or not in unicompartemental knee replacement – A study from the Swedish Arthroplasty Register.

Annette W-Dahl[1], Johan Kärrholm[2], Perna Ighani Arani[3], Ola Rolfson[2]
1. Orthopedics, Department of Clinical Sciences Lund, Lund University, Lund, Sweden. 2. 2. Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden. 3. Faculty of Medicine and Health, School of Medical Sciences, Örebro University, Örebro, Sweden

Background: The use tourniquet in knee replacement surgery is debated. Given the conflicting evidence in total knee replacement, there are no studies regarding the impact of using tourniquet or not in unicompartmental knee replacement (UKR).
Aim: The aim was to compare the risk of first time revision after medial UKR (mUKR) with or without the use of tourniquet.
Materials and Methods: In this observational study we included mUKRs performed between 2010 and 2024 due to osteoarthritis (OA) reported to the Swedish Arthroplasty Register with follow up until 31st December 2024. The main outcome was first revision for any reason. Further outcomes were first revision due to implant loosening and infection. Using Kaplan-Meier method, we estimated the cumulative revision rate (CRR) with 95% confidence interval (CI) for all causes, implant loosening and infection after mUKRs with or without the use of tourniquet. In multiple Cox regression analyses we analyzed whether use of tourniquet had any influence on the risk of revision due to all causes, implant loosening and infection with adjustment for potential confounding factors.
Results: Of the 17,825 mUKRs included, 13,797 were operated with (77%) and 4,021 (23%) without tourniquet. 1,150 first time revisions were reported. The Oxford uncemented version was the most reported mUKR model in both groups (n=8,213, 60% and n=1,882, 47%, respectively). CRR for all causes, implant loosening and infection was similar across all time points (2, 5 and 10 years). In the Cox regression analyses, adjusted for potential confounders, tourniquet use was not associated with an increased risk of revision for all causes (Hazard Ratio (HR) 1.07, CI 0.91–1.26), implant loosening (HR 0.91, CI 0.65–1.28) and infection (HR 1.1, CI 0.55–1.82).
Interpretation / Conclusion: The use of tourniquet, does not seem to have impact on the risk of revision all causes, implant loosening and infection in mUKR.

159. Pain and sleep in the first eight postoperative weeks after primary total knee arthroplasty. A Latent Class Growth Modelling analysis of 964 patients.

Walter van der Weegen[1,2], Casper Craamer[3,4], Hesseling Brechtje[5], Keetie Cremers[6], Michiel Siebelt[1], Rintje Agricola[1,7]

1. Department of Orthopedic Surgery, Sports & Orthopedics Research Centre, St Anna Hospital, Geldrop, the Netherlands; 2. Radboud University Medical Center, Nijmegen, the Netherlands; 3. IQ Health Science Department, Radboud University Medical Center, Nijmegen, Netherlands; 4. Interactive Studios B.V., Den Bosch, The Netherlands; 5. Reinier Haga Orthopedic Center, Zoetermeer, The Netherlands; 6. Department of Orthopedics, Canisius Wilhelmina Hospital, Nijmegen, The Netherlands; 7. Department of Orthopaedics, Erasmus MC University Medical Centre, Rotterdam, Netherlands

Background: Postoperative pain and sleep disturbances are major concerns for patients undergoing Total Knee Arthroplasty (TKA), yet detailed, objective data on their recovery trajectories in the first weeks are scarce.
Aim: This study aimed to describe these trajectories and to analyse their correlation.
Materials and Methods: Prospective observational study with weekly collection of pain and sleep scores in the first eight weeks after primary, unilateral TKA (n=964) in a fast-track surgery setting. Similar data from another hospital (n=256) was used for validation. Latent Class Growth Modelling was used to predict recovery patterns. Results were evaluated statistically and by a panel of arthroplasty surgeons (n=4) and physical therapists (n=4).
Results: Scores for sleep were worse than for pain. Nonlinear models with five subgroups yielded the best statistical fit, and were preferred by the clinicians panel. For pain, four classes showed continuous improvement, while one class (9.1%) got worse first before improving. For sleep, three classes showed continuous improvement, while two (worst scoring) classes did not improve. Patients in the highest pain trajectory had an over fifty-fold higher odds of experiencing severe sleep problems than those in the lowest pain trajectory. (20.8%) (BCH- ($x^2(16)=1855.6$, $p<0.001$)). Results from the second hospital confirmed the predicted trajectories.
Interpretation / Conclusion: Recovery of pain and sleep in the first eight postoperative weeks after TKA is nonlinear, with substantial variation between patients, but meaningful subgroups can be identified. Recovery of pain goes well for the majority of patients, sleeping problems are more persistent. Individuals tended to belong to matching pain and sleep classes.

160. Is there a role for lavage aspiration after a dry tap in the work-up for potential periprosthetic joint infection? A systematic review

Sander Bruyninckx[1], Stijn Ghijselings[1,2], Melissa Depypere [3,4], Alex Soriano [5], Willem-Jan Metsemakers [2,6], Georges Vles [1,2]

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Background: Lavage aspiration following a dry tap remains a debated technique in the work-up of periprosthetic joint infection (PJI) of the hip and knee.
Aim: This systematic review critically appraises the available evidence, with a particular focus on the diagnostic yield of lavage aspiration in detecting PJIs that would otherwise be missed.
Materials and Methods: A comprehensive literature search was conducted in accordance with the PRISMA guidelines across the PubMed, Embase, MEDLINE, and Cochrane databases.
Results: Eleven studies met the inclusion criteria, all level IV case series. Across 1965 patients, 2199 aspirations were performed. Overall, 798 procedures (36%) resulted in a dry tap. Lavage aspiration was attempted in 698 of these cases, with 691 successful attempts. Among dry taps, 154 PJIs were ultimately identified, corresponding to a PJI prevalence of 19 %. Lavage aspiration contributed to a correct diagnosis in 22 % of successful procedures. Pooled culture sensitivity and specificity following saline lavage were 66 % and 89 %, respectively. The diagnostic performance of polymorphonuclear neutrophils (PMNs) > 80% was similar between saline lavage and normal aspiration. Although no safety concerns were reported, the potential introduction of pathogens and the risk of false-positive results remain concerns that are not fully mitigated by the available evidence.
Interpretation / Conclusion: One in three aspirations result in a dry tap. Lavage aspiration provides analysable fluid in nearly all cases and appears to enable the diagnosis of PJI in roughly one out of five patients in whom standard aspiration fails. However, more robust evidence is needed before it can be recommended as a universal technique.

161. Metabolomics of osteoarthritis before and after total joint arthroplasty: a 7-year longitudinal cohort study

Elin Kersti Sõber-Williams[1], Kalle Kilk[3], Jaak Kals[2,4,5], Aare Märtson[1,6], Pärt Prommik[1], Kaspar Tootsi[1,4,6]
1. Department of Orthopaedics, Institute of Clinical Medicine, University of Tartu, Tartu, Estonia; 2. Clinic of Surgery, Tartu University Hospital, Estonia; 3. Department of Biochemistry, Institute of Biomedicine and Translational Medicine, University of Tartu, Estonia; 4. Endothelial Centre, University of Tartu, Estonia; 5. Department of Surgery, University of Tartu, Estonia; 6. Clinic of Orthopaedics, Tartu University Hospital, Estonia.

Background: Osteoarthritis (OA) is a prevalent, painful, and progressive joint disease involving systemic differences in multiple metabolic pathways. Total joint arthroplasty (TJA) is the best available treatment for end-stage OA as there is no approved preventative or disease-modifying treatment. In light of the limited treatment options, there is a need for greater understanding of the metabolic differences in OA, and which differences may be improved or resolved by the removal of inflamed joint tissue in TJA. Available metabolomic studies are largely cross-sectional and none examine systemic metabolic changes after TJA compared to age- and sex-matched controls.
Aim: This study aimed to identify changes in metabolic markers from before and 7 years after TJA to understand how TJA could influence long-term systemic metabolism in people with severe OA compared to healthy aging controls.
Materials and Methods: Fasting serum metabolites were measured in those with end-stage OA undergoing TJA and in age- and sex-matched healthy controls at baseline and 7-year follow-up.
Results: A total of 70 patients (age 62 ± 7) with severe OA who were undergoing TJA and 82 age- and sex-matched controls who did not have OA were included in the study. Three main themes arose from the differences between groups over time. First, the OA acylcarnitine profile showed a difference in lipid processing that normalized at follow-up for select medium- and long-chain species and diverged for hydroxy- and dicarboxy-acylcarnitines. Next, OA had a reduction in most circulating amino acids at follow-up relative to controls. Third, biogenic amine pathways demonstrated long-term remodeling in the handling of tryptophan and polyamines.
Interpretation / Conclusion: In addition to reducing pain, total joint replacement seems to partially normalize lipid metabolism, while the metabolic profile reveals persistent systemic metabolic remodeling, likely shaped by other determinants such as physical activity, diet, and comorbidities. While these patterns are consistent with altered mitochondrial lipid handling, the present study cannot directly assess mitochondrial function.

SESSION 35: FREE PAPER SESSION – HIP FRACTURE

Friday, 13 November 2026

13:15 – 14:00

Room: Harlekin

Chairs:

Anne Mørup-Petersen
Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital Bispebjerg and Frederiksberg, Denmark

Torbjørn Kristensen
Department of Orthopedic Surgery, Haukeland University Hospital, Norway

162. Ultra-Early Time to Surgery and Risk of Mortality and Reoperation after internal fixation for Femoral Neck Fractures: A Population-Based Study of 25078 patients.

Jacob Schade Engbjerg[1,2,3,4], Simon Storgaard Jensen [1,2], Alma B. Pedersen [1,2], Rune Dall Jensen [2,3], Rikke Thorninger [5], Michael Tjørnild [2,4], Per Hviid Gundtoft [5], Jan Duedal Rölfing [2,5]

1. Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark; 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark; 3. MidtSim, Department of Clinical Medicine, Aarhus University, Aarhus, Denmark; 4. Department of Orthopaedics, Regional Hospital Denmark, Randers, Denmark; 5. Department of Orthopaedics, Aarhus University Hospital, Aarhus, Denmark.

Background: Femoral neck fractures (FNF) have high mortality and failure rates after internal fixation. Surgery <24 hours is linked to lower mortality, but evidence on shorter time-to-surgery (TTS) remains limited.
Aim: To examine mortality and reoperation risk across 8-hour TTS intervals following FNF.
Materials and Methods: Patients undergoing internal fixation for FNF between 2004 and 2021 were identified in the Danish Multidisciplinary Hip Fracture Register (n=25,078). Exposure was defined as TTS, divided into 8-hour intervals, and outcomes were all-cause mortality and reoperation within 30 days and 1 year. We estimated the cumulative incidence of reoperation, accounting for death as a competing event. Adjusted hazard ratios (aHRs) with 95% confidence intervals (CI) were estimated across 8-hour TTS intervals, using TTS 0-8 h as reference.
Results: Mortality increased steadily with every 8h TTS-interval for both 30 days (aHR 1.3 [1.1;1.6]) and 1-year (aHR 1.3 [1.1;1.4]) for TTS > 48-72h vs 0-8h, with absolute mortality at 30 days ranging from 7% to 11% TTS 0-8h vs >48-72h, and at 1- year 24% to 33% TTS 0-8h vs >48-72h. aHR 1.04 [0.95;1.1] and aHR 1.02 [0.94;1.1] were found for TTS >8-16h and >16-24h vs TTS 0- 8h. Reoperation risk ranged from 3% at 30 days to 17% at 1-year; no association between TTS and reoperation risk was observed (aHR 1 [0.8;1.1] for TTS >48-72h vs 0-8h).
Interpretation / Conclusion: Longer TTS, assessed in 8-hour intervals, was associated with slightly higher mortality, while surgery within 24 hours remained the primary determinant. No consistent association between TTS and reoperation risk was found.

163. Multimorbidity and Long-Term Opioid Therapy After Hip Fracture Surgery: A Danish Nationwide Cohort Study of 64,254 Patients

Mohammad Morad[1,2], Simon Storgaard Jensen[1,2], Jan-Erik Gjertsen[3,4], Alma Becic Pedersen[1,2]
1. Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark; 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark; 3. Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Norway; 4. Department of Clinical Medicine, University of Bergen, Bergen, Norway.

Background: Opioids remain central to postoperative pain management after hip fracture surgery. However, prolonged use is associated with adverse events, and up to 25% of opioid-naïve patients transition to long-term opioid therapy (LTOT). Multimorbidity is common among hip fracture patients, but the association with LTOT remains largely unexplored.
Aim: To examine whether pre-existing comorbidities and multimorbidity patterns are associated with LTOT after hip fracture surgery among opioid-naïve patients.
Materials and Methods: We conducted a Danish nationwide cohort study of opioid-naïve patients aged ≥65 years who underwent hip fracture surgery between 2006 and 2021. Comorbidities were grouped into 10 clinically relevant categories based on hospital diagnoses. LTOT was defined as ≥2 opioid dispensings between postoperative days 31-365. Cumulative incidences were estimated for individual comorbidities and pairwise combinations using the Aalen-Johansen method with death as a competing event. Cox regression estimated adjusted hazard ratios (aHRs) with 95% confidence intervals (CIs).
Results: We included 64,254 patients (mean age 82, 70% female). The 1-year incidence of LTOT was 28% (CI 28-29) overall and 23% (CI 22-24) in patients without comorbidity. Individually, incidences of LTOT were highest for hepatic/ gastrointestinal disease (36% (CI 35-38)) and non-dementia mental disorders (35% (CI 34-36)), and lowest for malignancy (31% (CI 30-32)). Among combinations, incidences and risks were highest for hepatic/gastrointestinal disease in combination with non-dementia mental disorders (42% (CI 39-46); aHR 2.27 (CI 1.79-2.87)) or pulmonary disease (42% (CI 38-46); aHR 2.52 (CI 1.87-3.40)), and lowest for dementia in combination with neurological/alcohol disorders (29% (CI 26-33); aHR 1.33 (CI 1.01-1.73)).
Interpretation / Conclusion: Both individual comorbidities and multimorbidity patterns were associated with increased LTOT risk after hip fracture surgery, with the highest risk seen in hepatic/gastrointestinal disease, especially in combination with non-dementia mental disorders or pulmonary disease. These findings may help clinicians identify high-risk profiles for targeted strategies to prevent prolonged opioid use.

164. Muscle-sparing posterior approaches vs. posterior and lateral approach in femoral neck fracture patients treated with hemiarthroplasty - A systematic review and meta-analysis

Anne Katrine Løndorf Thiim [1,2], Raymond Andre Tellefsen[3], Bjarke Viberg[1,2], Michaela Manalili Hansen[1,2]
1. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital 2. Department of Clinical Research, University of Southern Denmark 3. Division of Orthopaedic Surgery, Oslo University Hospital, Oslo, Norway

Background: Muscle-sparing posterior (MSP) approaches have been proposed to reduce soft-tissue disruption and improve stability in hip hemiarthroplasty for femoral neck fracture management. Their comparative effectiveness versus conventional posterior or lateral approaches remains uncertain.
Aim: To compare risk of postoperative dislocation after hip hemiarthroplasty using MSP approaches versus conventional posterior or lateral approach.
Materials and Methods: A systematic review and meta-analysis was performed following cochrane guidelines and reported using PRISMA guidelines. PubMed, Embase, the Cochrane Library, and Scopus were systematically searched. Screening was conducted independently by two reviewers. Randomised and comparative cohort studies reporting dislocation after MSP versus posterior or lateral approaches were included. Risk ratios were pooled using random-effects models, with heterogeneity assessed using I2. Risk of bias was assessed with RoB 2.0 and ROBINS-I.
Results: 17 studies were included, of which four were randomised trials. The studies included 4722 patients with a mean age of 82.7 years, and 68.8% were women. There were two RCTs for both MSP vs posterior and MSP vs lateral. They showed no significant difference (Posterior: RR 0.53 95% CI 0.03-9.27, lateral: RR 0.67, 95% CI 0.11-4.9) but were few and showed variable risk of bias. Pooling cohort and RCT studies, 11 compared MSP with a posterior approach (n=1886) and showed lower dislocation risk (RR 0.25, 95% CI 0.11–0.54). Seven studies compared MSP with a lateral approach (n=2780) and found no difference in dislocation risk (RR 0.88, 95% CI 0.36–2.12). Most cohort studies had moderate to critical risk of bias, limiting the certainty of the pooled estimates.
Interpretation / Conclusion: RCTs show no clear difference in risk of dislocation between either approach. In the analysis of all studies, MSP may be associated with a lower dislocation risk compared with the posterior approach, while no clear difference was observed compared with the lateral approach. Interpretation of the results is limited by the small number of randomised trials and the overall risk of bias in the included studies.

165. Efficacy and Safety of Tranexamic Acid in Hip Fracture Surgery: A Retrospective Propensity Score-Matched Analysis of 1,218 Patients

Frederik M. Jacobsen[1], Simone Trolle [1], Rune Munch Trangbæk [1], Anne Marie Nyholm [1], Pelle Baggesgaard Petersen
Department of Orthopedic Surgery, Copenhagen University Hospital - Herlev and Gentofte, Herlev, Denmark

Background: Tranexamic acid (TXA) reduces surgical bleeding, but its implementation and effect in contemporary hip fracture care pathways need further documentation.
Aim: We investigated TXA's effect on blood loss, transfusions, mortality, readmissions, and complications.
Materials and Methods: This retrospective cohort study included 2,622 consecutive hip fracture procedures performed at a single center (2021–2025). To adjust for baseline confounding, a balanced subcohort (n=1,218) was created using 1:1 nearest-neighbor propensity score matching (PSM) based on age, sex, ASA score and surgery type. Multivariable logistic regression estimated adjusted odds ratios (aOR) for 30- and 90-day mortality and readmission risks.
Results: Overall, 1,525 (58%) patients received TXA. Within the balanced PSM cohort, TXA administration was significantly associated with a lower number of patients requiring any blood transfusion compared to the non-TXA group (76 vs. 103 patients; $p < 0.05$). When evaluating transfusion volumes, this difference was primarily observed in fewer TXA patients requiring 1-2 units (50 vs. 74 patients), whereas the incidence of heavier transfusions (≥3 units) was similar between the groups (26 vs. 29 patients). Calculated total blood loss was lower but lacked statistical significance (1,297 vs 2,013 mL; $p = 0.24$). PSM revealed no significant differences in venous thromboembolism (1.0% vs 0.5%; $p = 0.51$) or other severe complications. Multivariable regression confirmed TXA did not independently increase 30-day mortality (aOR: 1.14; 95% CI: 0.86-1.51; $p = 0.35$), 90-day mortality (aOR: 1.12; 95% CI: 0.89-1.42; $p = 0.33$), or 90-day readmissions (aOR: 1.10; 95% CI: 0.90- 1.35; $p = 0.34$).
Interpretation / Conclusion: Tranexamic acid administration was associated with reduced postoperative transfusion requirements in hip fracture surgeries, without an associated increase in complications. After adjusting for baseline confounders, TXA was not associated with higher mortality, readmission rates, or thromboembolic events, supporting its safe and routine use in the perioperative setting.

166. Initiation of anti-osteoporosis medications after hip fracture in Denmark – are we doing better in recent years?

Rikke Sommer Haaber[1,2], Alma B. Pedersen[1,2]
1. Department of Clinical Epidemiology, Aarhus University Hospital, Denmark 2. Institute of Clinical Medicine, Aarhus University, Denmark

Background: Secondary fracture prevention after hip fracture is an important component of post-fracture care. However, a substantial treatment gap has been reported worldwide.
Aim: To examine initiation of anti-osteoporosis medications (AOM) after hip fracture in Denmark and to assess differences across specific subgroups of patients using recent nationwide data.
Materials and Methods: By combining Danish medical registries, we identified patients aged ≥65, with no recent AOM use and a first-time hip fracture between 2010 and 2020 (n=57,887). Outcome was initiation of AOM defined by pharmacy dispensations and hospital treatment codes. Among patients without AOM use in the year prior to hip fracture, 1-year cumulative incidence functions (CIF) with 95% confidence intervals of initiation of AOM with death as competing risk were calculated. Analyses were stratified on sex, age, somatic comorbidity, living arrangement, and calendar year.
Results: The 1-year CIF of initiation of AOM after hip fracture was 18.4 (18.1-18.7) %. Higher initiation of AOM was seen in patients <80 years, women, in patients with less somatic comorbidity, cohabiting in own home, and in more recent calendar years.
Interpretation / Conclusion: Although initiation AOM after hip fracture remains suboptimal, the cumulative incidence of treatment initiation has improved in recent years. However, treatment gaps in specific subgroups of patients persist, highlighting an ongoing gap in secondary fracture prevention after hip fracture.

SESSION 36: FREE PAPER SESSION – PEDIATRICS

Friday, 13 November 2026

13:15 – 14:00

Room: Blomster salen

Chairs:

Sebastian Rönnequist
Section for Paediatric Orthopaedics, Department of Orthopaedics and Traumatology Copenhagen University Hospital –Rigshospitalet, Denmark

Ahmed Halloum
Interdisciplinary Orthopaedics, Aalborg University Hospital, Aalborg, Denmark

167. Gait and patient-reported outcomes of serial casting in children with moderate to severe idiopathic toe-walking: 3-months follow-up of a prospective cohort study

Sidsel Hald Rahlf[1], Christian Færgemann[1,2], Tina Pasgaard[1,2], Julie Ladeby Erichsen[1,2], Morten Bøgelund Pedersen[2], Bjarke Viberg[1,2], Anders Holsgaard-Larsen[1,2]
1. Department of Orthopedic Surgery and Traumatology, Odense University Hospital, Denmark. 2. Orthopedic Research Unit, Department of Clinical Research, Faculty of Health Sciences, University of Southern Denmark.

Background: Idiopathic toe-walking (ITW) is frequently associated with fatigue, falls, pain, and activity limitations. Serial casting is considered a safe, non-invasive intervention, typically reserved for mild cases, whereas more severe presentations often require Achilles tendon lengthening.
Aim: The study aimed to evaluate functional outcomes and gait following serial casting in children presenting with moderate-severe ITW.
Materials and Methods: This cohort included children aged 7-15 with symptomatic ITW. Exclusion criteria: mild or absent toe-walking confirmed by 3-dimensional gait analysis (3DGA), neuromuscular disorders, unilateral-toe-walking, previous Achilles tendon lengthening, psychomotor disabilities, or inability to participate. Participants underwent 4-6 weekly bilateral serial castings until at least 15° ankle dorsiflexion with the knee extended. Assessments included passive ankle dorsiflexion, the Oxford Ankle Foot Questionnaire for Children (OAFQ-C), and 3DGA at baseline and at three-month follow-up.
Results: Of 51 children assessed, 18 were excluded due to only mild or absent toe-walking on baseline 3DGA. The remaining 33 children (7 girls, 26 boys; mean age 10 years) underwent serial casting: 21 children received 4 casts, 6 received 5 casts, and 6 received 6 casts. Significant ($p<0.001$) and clinically relevant improvements were observed in passive ankle dorsiflexion (1.5°, [1.0-3.9] vs.9.2°, [7.3-11.1]) (mean [95% CI]), ankle kinematics and kinetics (SPM-analysis), and for the overall OAFQ-C (38.9 [36.0-41.8] vs 52.8 [50.7-54.9]) (mean [95%CI]). The improvement was also observed in all OAFQ-C sub-scores (physical, school and play, and emotional score).
Interpretation / Conclusion: Serial casting resulted in positive functional and patient-reported short-term outcomes for children with moderate-to-severe ITW. This study addresses a condition that significantly affects children's mobility, comfort, and participation in daily life. Improved ankle function and patient-reported outcomes can translate into better quality of life, reduced pain, and enhanced independence, which are priorities for children with idiopathic toe-walking and their caregivers.

168. Slipped Capital Femoral Epiphysis and The Second Slip

Nina Alsgaard Pachai[1], Andreas Balslev-Clausen[1], Karl Sebastian Strøm Rönnquist[1]
1. Section for Paediatric Orthopaedics, Department of Orthopaedics and Traumatology Copenhagen University Hospital – Rigshospitalet, Denmark

Background: Slipped capital femoral epiphysis (SCFE) is the most common hip disorder in adolescents. Patients who present with unilateral SCFE are at risk of developing a contralateral slip, increasing the risk of bilateral hip dysfunction and long-term morbidity. There is ongoing debate regarding whether prophylactic fixation of the unaffected hip should be recommended.
Aim: To describe the epidemiology, clinical characteristics, and radiological findings in a longitudinal cohort of Danish children with SCFE, and to identify factors associated with the development of a subsequent contralateral slip.
Materials and Methods: A retrospective cohort study was conducted, including all patients aged ≤17 years who underwent surgery for SCFE at Rigshospitalet, Denmark, between April 1, 2020 and April 1, 2025. Clinical and radiographic data were systematically collected and reviewed from electronic medical records. Patients were categorised as having unilateral SCFE, bilateral SCFE at diagnosis, or a subsequent contralateral slip. Chi-square tests assessed associations between risk factors and bilateral disease,including both initial and subsequent slips.
Results: Of 47 eligible patients, 44 were included (14 female, 30 male; mean age at diagnosis 12.2 and 14.0 years). At final follow-up (mean 23.2 months), 9 of 44 patients (20.5%) had bilateral SCFE, including 5 who developed a subsequent contralateral slip. All subsequent slips occurred within 10 months of the first (mean 6.1 months), and diagnostic delay at second slip was minimal (mean 1.75 weeks). Female sex ($p = 0.043$), younger chronological age ($p < 0.001$), younger bone age ($p <0.001$), and higher BMI were associated with bilateral SCFE. Slip severity at initial presentation was not associated with risk of subsequent contralateral slip ($p = 0.4$).
Interpretation / Conclusion: Younger age, both chronological and skeletal, and higher BMI were significant risk factors for bilateral SCFE. All second slips occurred within 10 months, supporting the effectiveness of current follow-up routines. These findings highlight the importance of age and sex in shared decision-making regarding prophylactic fixation. Larger studies are needed to guide treatment decisions.

169. Gait, radiographic, and clinical outcomes in slipped capital femoral epiphysis patients treated with in situ fixation compared to matched healthy controls

Frederike Mulder[1], Rachel Senden[2], Heleen Staal[3], Robin de Bot[3], Rik Marcellis[2], Florens van Douveren[4], Marieke van der Steen[4,5], Jaap Tolk[4,6], Kenneth Meijer[7], Adhiambo Witlox[3]

1. Department of Orthopaedic Surgery, Maastricht University, Maastricht, The Netherlands. 2. Department of Physiotherapy, Maastricht University Medical Center (MUMC+), Maastricht, The Netherlands. 3. Department of Orthopaedic Surgery, MUMC+, Maastricht, The Netherlands. 4. Department of Orthopaedic Surgery & Trauma, Máxima Medical Center, Veldhoven, The Netherlands. 5. Department of Orthopaedic Surgery & Trauma, Catharina Hospital Eindhoven, PO box 1350, 5602 ZA Eindhoven, The Netherlands 6. Department of Orthopedics & Sports Medicine, Erasmus MC – Sophia Children's Hospital, Rotterdam, The Netherlands. 7. Department of Nutrition and Movement Sciences, NUTRIM School of Nutrition and Translational Research in Metabolism, Maastricht University, Maastricht, The Netherlands.

Background: Slipped capital femoral epiphysis (SCFE) treated with in situ fixation (ISF) is characterized by a persistent proximal femoral deformity, which might lead to femoral acetabular impingement syndrome, gait deviations and early-onset osteoarthritis (OA). Multidimensional methods that identify early-onset OA markers are warranted to improve long-term outcomes for SCFE patients.
Aim: To analyze gait, radiographic data, and clinical questionnaires in SCFE patients treated with ISF compared to healthy controls.
Materials and Methods: Patients and matched healthy controls underwent gait analysis at the Computer Assisted Rehabilitation ENvironment (CAREN) system. Trunk, pelvis, hip, knee, and ankle kinematics, in sagittal, frontal and transverse plane, were compared between groups using statistical parametric mapping (SPM). Also, spatiotemporal parameters, gait variability, radiographic data, and clinical surveys (VAS, Borg CR10, SF-36, HOOS) were collected.
Results: Nine patients (16.0 (4.5) years, 5F/4M) showed significantly less pelvic drop in swing phase (55-80% of the gait cycle), increased external hip rotation in swing phase (53-83%), and reduced plantar flexion during push off (58-87%) compared to healthy controls (17.0 (6.0) years, 5F/4M). Patients walked significantly slower ($p<0.001$), with larger gait variability, higher alpha angles on the slip-side compared to the sound-side ($p=0.034$) and scored 100 (62.5- 100) for general health (SF-36) and 96.25 (73.8- 100) for total functional limitation score (HOOS).
Interpretation / Conclusion: Although SCFE patients report good general health, few functional hip limitations, and no pain, they show persistent deviations in gait and radiographic signs of cam deformities postoperatively. Long-term follow-up is warranted to examine if these gait- and radiographic deviations translate into early-onset OA.

170. No Neurologic Deficits Observed After Acute Distal Femoral Osteotomy for Pediatric Genu Valgum with Corrections Up to 18.5°: A Retrospective Cohort

Christopher Iobst[1], Anirejuoritse Bafor[1], Dannah Javens[1], Shima Gholinezhad[2], Mindaugas Mikuzis[2], Soren Kold[2], Ole Rahbek[2]
1. Nationwide Children's Hospital 2. Interdisciplinary Orthopaedics, Aalborg and Aarhus UH

Background: No consensus currently exists regarding how much acute correction of distal femoral valgus deformity can be safely performed in pediatric patients without causing neurologic stretch injury.
Aim: This multicenter retrospective study evaluated correction magnitude after acute distal femoral osteotomy for pediatric genu valgum and the occurrence of neurologic complications.
Materials and Methods: We retrospectively reviewed pediatric patients who underwent a distal femoral osteotomy to acutely correct genu valgum between January 1, 2016, and June 30, 2024, with at least 1-year follow-up. Demographics, radiographic measurements, operative details, and complications were collected. Preoperative and postoperative mLDFA and aLDFA were measured on standing radiographs or EOS scans. Correlation and multiple linear regression analyses assessed whether preoperative femoral length and preoperative mLDFA and aLDFA predicted postoperative alignment.
Results: 25 limbs in 22 patients were included. The mean preoperative femoral length was 45 cm. The mean mLDFA improved from 79 to 89 degrees and aLDFA from 76 to 85 degrees (both $p<0.0001$). The mean corrections were 10 and 8.5 (range 1.8 – 18.5 and 0.4 – 15.8) degrees, respectively. No neurologic complications occurred, and femoral length was not associated with correction magnitude.
Interpretation / Conclusion: Acute correction following a distal femoral osteotomy with internal fixation for pediatric genu valgum was performed without neurologic complications. Corrections of 10 to 15 degrees appear safe, and corrections up to 18.5 degrees may be tolerated. Larger studies are needed to better define the upper threshold for safe acute correction.

171. Congenital Vertical Talus Treated by Dobbs Method: A Retrospective Case Series Focusing on Recurrence Rate and Treatment Complications

Malin Brännlund[1,2], Marianne Frydendal Nielsen[1,2], Bjarne Møller-Madsen[1,2], Vilhelm Engell[1,2]
1. Department of Orthopaedics, Aarhus University Hospital, Denmark 2. Danish Paediatric Orthopaedic Research, DPOR. Department of Clinical Medicine, Aarhus University Hospital, Denmark

Background: Congenital vertical talus (CVT) is a rare foot deformity with a dorsal dislocation of the talonavicular joint. If left untreated the deformity may lead to long-term disability. Traditionally, treatment consisted of extensive soft tissue release, which is associated with high complication rates. Since 2006, a less invasive approach, the Dobbs method, has become the preferred treatment for CVT.
Aim: To evaluate outcomes of children with CVT treated with the Dobbs method focusing on recurrence rate and treatment-related complications.
Materials and Methods: This retrospective case series reviewed medical records and radiographs of children with CVT treated at Aarhus University Hospital between 2020 and 2025. Demographic data, complications and functional outcomes were assessed in patient charts. Radiographic measurements included the lateral talar axis– first metatarsal base angle (TAMBA) and the talocalcaneal angle (TCA). Recurrence was defined as a post-operative TAMBA >30° and clinical indication for reoperation.
Results: Three patients (five feet) were included. Two patients had syndromic CVT, and one had idiopathic CVT. Mean follow-up time was 52 months (range 38-69 months). Recurrence occurred in three out of five feet (60%); all among the syndromic patients. No treatment-related complications were reported. Functional outcomes reflected the patients' underlying comorbidities.
Interpretation / Conclusion: The main finding of this study was a recurrence rate of 60% (3 out of 5 feet), all occurring in syndromic patients. The idiopathic (unilateral) case and one of the syndromic feet remained corrected during the full follow-up period. No treatment-related complications were observed. The radiographic measurements in this study aligned with the clinical outcomes. Due to the small sample size, findings in this study should be interpreted with caution. Nevertheless, findings can be compared to existing literature with similar aims. In accordance with existing literature, our study indicated that the Dobbs method seems reliable for correction of idiopathic CVT. Syndromic cases seem to have a higher risk of recurrence.

SESSION 37: FREE PAPER SESSION – INFECTION/AMPUTATION

Friday, 13 November 2026

13:15 – 14:00

Room: Ballon salen

Chairs:

Julie Weber Egholm
Department of Orthopaedic Surgery, Copenhagen University Hospital - Amager and Hvidovre, Denmark

Michala Skovlund
Department of orthopedics and Centre for Evidence-Based Orthopaedics, Department of Orthopaedic Surgery, Zealand University Hospital Køge, Denmark

172. The Association Between Residual Limb Pain, Functional Level, and Quality of Life in Prosthesis Users After Municipality-based Rehabilitation: A cross-sectional study of 167 adults with lower limb amputation

Inger Mechlenburg[1,2,3,4], Lisa Urup Tønning[1,2], Luise Bové Thisgaard[1], Betül Kocak[1], Kajsa Lindberg[5], Jesper Severin Eliassen[6], Bjarne Sommer Sørensen[6], Jan Arnholtz Overgaard[7,8,9], Morten Tange Kristensen[10,11]
1. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus, Denmark 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark 3. Department of Public Health, Aarhus University, Aarhus, Denmark 4. Research Center for Activity and Prevention, VIA University College, Aarhus N, Denmark 5. Health and Rehabilitation Centre Vanløse, Copenhagen Municipality, Copenhagen, Denmark 6. Orthopaedic Rehabilitation Centre, Aarhus Municipality, Aarhus, Denmark 7. Department of Rehabilitation, Lolland Municipality, Maribo, Denmark 8. Center for Muscle and Joint Health, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark (SDU), Odense, Denmark 9. Research and Implementation Unit PROgrez, Department of Physiotherapy and Occupational Therapy, Central and West Zealand Hospital, Region Zealand, Denmark 10. Department of Physical- and Occupational Therapy, Copenhagen University Hospital, Bispebjerg and Frederiksberg, Copenhagen, Denmark 11. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark

Background: Residual limb pain is common after lower limb amputation and may affect rehabilitation, but its clinical impact is unclear. Evidence on how it influences mobility and quality of life in prosthesis users is limited.
Aim: To examine the impact of residual limb pain on mobility outcomes and health related quality of life at the end of rehabilitation among adults with a major lower limb amputation who completed prosthetic rehabilitation.
Materials and Methods: Cross-sectional observational study using data from municipality-based rehabilitation in the Danish PROAMP database. The exposure was the presence of limb pain (yes/no) at the end of rehabilitation. Mobility outcomes included the Timed Up&Go test, 10 Meter Walk Test, 2 Minute Walk Test, and New Mobility Score. Health related quality of life was assessed using the EQ 5D 5L. Associations were examined using multivariable linear regression adjusted for age, sex, and cause of amputation. Length of rehabilitation related to limb pain or not was compared between groups.
Results: A total of 167 adults with a major lower limb amputation (mean (SD) age of 65 (14.0) years, 74% men) were included. The primary causes of amputation were dysvascular disease (44%) and diabetes (27%). Eighty-six and 81 had a below- and above knee amputation, respectively. Fifty-three (32%) and 34 (20%) of participants reported residual limb pain at start of- and at the end of rehabilitation, respectively. Limb pain was not associated with performance on any mobility test. However, participants with limb pain reported significantly lower health related quality of life (EQ 5D 5L index, mean difference = 0.2; 95% confidence interval (95%CI) 0.1 to 0.2; $P < 0.001$) vs. those without limb pain adjusted for sex, age and cause of amputation. Correspondingly, participants with limb pain had a longer rehabilitation trajectories (mean difference = 49 days; 95%CI 5 to 93; $P = 0.03$).
Interpretation / Conclusion: Limb pain is associated with reduced health related quality of life and need for longer trajectories of rehabilitation but not with mobility outcomes after prosthetic rehabilitation. Pain should therefore be considered an important factor in rehabilitation assessment and planning.

173. The Value of Paired Microbiology and Histology in Chronic Osteomyelitis and Fracture-Related Infections

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Background: Microbiology and histology are independent diagnostic criteria in chronic osteomyelitis (cOM) and fracture-related infection (FRI), but their combined prognostic value is unclear.
Aim: This study evaluated whether paired assessments within the same tissue sample provide additional insight into disease severity.
Materials and Methods: In this prospective single-centre study, adults undergoing surgery for confirmed FRI or cOM were included. Clinical classification (FRI, BACH) was recorded. Five deep-tissue samples were obtained intraoperatively and divided for culture and histological assessment of neutrophils and osteoclasts. Histological positivity was defined as >5 neutrophils per high-power field (×400) per guidelines. Microbiological positivity was defined as growth of phenotypically identical organisms in ≥2/5 samples.
Results: Forty-one patients (11 cOM, 30 FRI) were included; 68% received preoperative antibiotics and >60% had poorly controlled comorbidities. Nineteen patients (46%) were culture-positive and 32 (78%) histology-positive. Of 205 samples, 31% were culture-positive, 56% histology-positive, and 26% double-positive. Histological scores were higher in culture-positive samples ($p<0.001$). Treatment failure occurred in seven patients (18%), all with FRI. Paired positive samples were associated with increased odds of failure and earlier revision, with a 1.68-fold increase per additional paired positive sample (95% CI 1.10–2.77). Osteoclast distribution did not differ between groups ($p=0.23$).
Interpretation / Conclusion: The paired analysis demonstrated a strong concordance between culture positivity and suppurative inflammation within the same sample. Combining microbiology and histology may help identify patients at increased risk of revision, although larger studies are needed. The present study indicates that when a viable bacterium induces an inflammatory response, there is a greater risk of non-osteoclast-based tissue breakdown, destruction, or liquefaction, and thus a greater risk of local bacterial dispersion or hiding, which may facilitate mis-removal during debridement and antibiotic therapy, leading to increased risk of relapse.

94. Evidence Beyond the RANKL Paradigm: Rethinking Bacterial Osteolysis

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Background: Bone and joint infections (BJIs) are debilitating conditions characterized by intraosseous bacteria, biofilm formation, suppurative inflammation, and osteolysis. Bacteria-associated bone loss is traditionally attributed to RANKL-mediated osteoclast activation, largely based on in vitro and murine studies. However, emerging translational evidence from large-animal models and clinical studies suggests this paradigm may not fully explain bacteria-associated osteolysis.
Aim: This translational study applied a porcine implant-associated osteomyelitis (IAO) model and patients with fracture-related infection (FRI) to investigate mechanisms of infectious osteolysis.
Materials and Methods: RANKL signalling was inhibited using Denosumab in vivo, and bone loss was assessed by CT and histology, while osteoclast activity was assessed by immunohistochemistry and qPCR. FRI patients were categorized as osteolytic (n=14) and non-osteolytic (n=7) based on CT. Biopsies collected at revision surgery were assessed by histology to quantify osteoclasts and by mRNA in situ hybridization to quantify RANKL, MMP1, and C3 expression.
Results: In the IAO model, RANKL inhibition with Denosumab did not reduce radiographic osteolysis compared to controls; CT-defined bone loss was increased in treated animals (1.25 vs 0.63 cm^3, p=0.005) despite a marked reduction in osteoclasts. Local RANKL expression did not correlate with bone loss. In FRI patients, osteoclast numbers were not associated with osteolysis severity (ρ=0.34, p=0.21). In contrast, MMP1 expression was increased in osteolytic lesions, whereas RANKL expression remained unchanged between groups. Spatial analyses showed heterogeneous expression of MMP1 and RANKL, in contrast to uniform C3 expression. Osteolysis severity correlated with MMP1 spatial burden (ρ=0.74, p=0.011).
Interpretation / Conclusion: These findings shows that bacterial-associated osteolysis is not primarily driven by RANKL-mediated osteoclastogenesis but is a multifactorial process shaped by inflammation, proteolysis, neutrophil responses, and impaired osteogenesis. This challenges the prevailing RANKL paradigm and supports a broader osteoimmunological model, or conceptualization, of infectious bone loss.

175. Impact of Empiric Antibiotic Spectrum and Patient Characteristics on Clinical Outcomes in Bone and Joint Infections: A Retrospective Cohort Study

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Background: Bone and joint infections (BJI) are a significant clinical challenge due to its tendency of recurrence, added healthcare expenses, reduced quality of life, and mortality. Empiric antibiotic regimes are commonly based on deductions from in vitro microbiologic findings, despite the fact that the relative efficacy and optimal antibiotic choices are under explored.
Aim: This study aims to evaluate the clinical outcome of BJI patients treated with a narrow-spectrum empiric antibiotics, compared on susceptibility to the antibiotic regime and on patient specific characteristics and co-morbidities.
Materials and Methods: This retrospective cohort study included 521 patients surgical treated for BJI between 2016 and 2023. All patients received a narrow-spectrum, Gram-positive–targeted empiric systemic antibiotic regimen, determined according to regional recommendations. The primary outcome was clinical failure within one year, with a minimum follow-up of 12 months. For the analyse, patients were divided into three groups based on microbiological susceptibility: susceptible (EmpSus), non-susceptible (NonSus) and culture negative (CulNeg) patients.
Results: Preforming multivariate analyses, age at primary operation was found to be independently associated with overall failure rate (P = 0.04) and ASA group (P = 0.047) and peripheral arterial disease status (PAD) (P = 0.043) was independently associated with secondary outcome: proximal amputation. NonSus patients had more than twice the odds of clinical failure (OR 2.10, 95% CI 1.12–3.95) and nearly fivefold higher odds of secondary proximal amputation (OR 4.95, 95% CI 1.41–23.2) compared with SusEmp patients.
Interpretation / Conclusion: The current study demonstrate that a large group of patients can presumably be treated safely with a more restrictive narrow approach. More studies are needed to identify subgroups suited for safe use of a narrow spectrum empiric regime. This knowledge would justify a more restrictive stewardship of broad-spectrum antibiotic use, without negative impact on patient outcome.

176. A Narrative Short Clinical Guideline: Diagnosis of Fracture-Related Infection (FRI) Using Standardised Diagnostic Criteria

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Background: Fracture-related infection (FRI) is a serious complication following fracture management. In 2018 the FRI Consensus DeDinition was published (and updated in 2020), but diagnostic practice remains inconsistent across centres and no national Danish standard exists. Uniform adoption of validated diagnostic criteria is essential not only for patient care, but to generate comparable data that can advance our understanding of which diagnostic approaches truly improve outcomes.
Aim: To provide evidence-based recommendations for the diagnosis of FRI and to evaluate the diagnostic accuracy and clinical applicability of the FRI Consensus DeDinition as a basis for a national Danish standard.
Materials and Methods: A narrative systematic review was conducted based on a structured PubMed search (March 2026). Seventeen studies published between 2018 and 2024 were included and critically appraised using the Oxford Centre for Evidence-Based Medicine Levels of Evidence 2009. Recommendations were graded A–D accordingly.
Results: The conDirmatory criteria of the FRI Consensus DeDinition were validated in a multinational cohort of 637 patients (sensitivity 97.5%, speciDicity 100%; level 2b, Grade B). Serum inDlammatory markers (CRP, leukocyte count, ESR) are insufDicient to conDirm or exclude FRI and should serve only as suggestive criteria (level 2a, Grade B). A minimum of 5 deep tissue specimens with a cut-off of ≥2/5 positive cultures is recommended (level 3b, Grade C). Quantitative histology (>5 neutrophils/HPF) conDirms FRI with PPV 100% (level 3b, Grade C). FDG-PET/CT should not be performed within 1 month of surgery (level 3b, Grade C).
Interpretation / Conclusion: The FRI Consensus DeDinition provides a validated, clinically applicable diagnostic framework. Systematic implementation across Danish departments is recommended to standardise care and enable future research into diagnostic accuracy and clinical outcomes.

POSTER WALK & BUBBLES

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Chairs:

Christian Fugl Hansen
Department of Orthopaedic Surgery, Bispebjerg and Frederiksberg Copenhagen University Hospital, Denmark

19 poster walks · posters 200 – 388

POSTER WALK 1: TUMOR

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Asger Martin Haugaard

Christina Holm

Posters 200–209

200. Bibliometric insights into the 100 most cited publications on malignant bone tumours: an orthopaedic oncology perspective

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1. Department of Trauma & Orthopaedic Surgery, St Vincent's University Hospital, Elm Park, Dublin 4; 2. School of Medicine, University College Dublin (UCD), Belfield, Dublin 4.

Background: To identify and analyse the 100 most cited publications on malignant bone tumours from an orthopaedic perspective, focusing on osteosarcoma, Ewing's sarcoma, chondrosarcoma, adamantinoma, multiple myeloma, and primary bone lymphoma.
Aim: To identify and analyse the 100 most cited publications on malignant bone tumours from an orthopaedic perspective, focusing on osteosarcoma, Ewing's sarcoma, chondrosarcoma, adamantinoma, multiple myeloma, and primary bone lymphoma.
Materials and Methods: A bibliometric analysis of the Web of Science Core Collection (accessed October 1st, 2025) was performed. A topic-based search identified studies relating to six malignant bone tumour types. Inclusion criteria were English-language articles and reviews within orthopaedics with a surgical focus. The 100 most cited papers were analysed for citation metrics, publication characteristics, authorship, institutions, countries, and journals. Co-authorship and keyword networks were assessed using VOSviewer.
Results: From 196,933 records, 1,082 articles met inclusion criteria. The top 100 papers accumulated 13,479 citations (mean 134.8; H-index 85). Most publications were from 2000–2019 (93%). Osteosarcoma and Ewing's sarcoma predominated. The United States contributed most publications (n=48), followed by Italy (n=20) and Germany (n=11). Surgical themes, particularly limb-salvage and reconstruction, were dominant. Rarer tumours were underrepresented.
Interpretation / Conclusion: Highly cited orthopaedic literature on malignant bone tumours is dominated by common sarcomas and surgical innovation, with limited representation of rarer entities, highlighting the need for collaborative research efforts.

201. Survival and Local Recurrence in Patients with Epithelioid Sarcoma of the Extremities and Trunk Wall in Denmark from 2000 to 2024: A Retrospective Study

Tobias Bak Skov[1], Afrim Iljazi[1], Mathias Ørholt Nielsen[2], Ida Karoline Wulff[2], Maj-Lis Talman[3], Thomas Baad-Hansen[4], Christina Enciso Holm[1], Michael Mørk Petersen[1], Andrea Pohly Jeppesen Thorn[1]
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Background: Epithelioid sarcoma (ES) is a rare subtype of soft tissue sarcoma (STS) accounting for less than 1% of all STSs. It is characterized by high recurrence rates, a younger patient population (peak 35 years), and metastases to the lung, pleura, and lymph nodes. Existing literature is limited, and population-based data on survival and local recurrence remains sparse.
Aim: The aim of this study was to describe the clinical characteristics and outcomes, including overall survival in all patients and local recurrence in surgically treated patients with ES in Denmark.
Materials and Methods: The retrospective national cohort study was based on data from the Danish National Pathology Registry (Patoweb) and patient records from Rigshospitalet and Aarhus University Hospital. We included patients with an eligible SNOMED code for ES who were diagnosed between January 1, 2000, and June 1, 2024. Only patients with a primary tumor located on the trunk or extremities were included. The primary outcome was overall survival, and the secondary outcomes included overall survival and the local recurrence rate among patients who underwent surgery. Survival probabilities were estimated using the Kaplan–Meier method, whereas the cumulative incidence of local recurrence was estimated using the Aalen–Johansen estimator, with death treated as a competing risk.
Results: A total of 46 eligible patients were identified. The mean age was 44 years (SD 21), and 25 patients (54%) were male. The median follow-up was 13 years (range, 0–23). The survival probability 23 years after diagnosis was 20% (95% CI 1–40%), with the majority of deaths occurring within the first five years. Among patients who underwent surgery, the survival probability after 23 years was 22% (95% CI 1–43%), while the cumulative incidence of local recurrence was 30% (95% CI 16–44%). No recurrences occurred after the fourth year.
Interpretation / Conclusion: In this nationwide retrospective cohort, ES of the extremities and trunk wall was confirmed to be a rare but aggressive malignancy associated with poor long-term survival. Most deaths and all local recurrences occurred within the first five years following diagnosis, supporting the current five-year follow-up program in Denmark.

202. Increased use of local infiltration anaesthesia in surgery for subcutaneous lipomas.

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Background: The COVID-19 pandemic had secondary effects, including a temporary reduction in the availability of general anaesthesia due to a shortage of nurse anaesthetists. This situation prompted the question: could local anaesthesia be a feasible alternative for patients with sub-cutaneous lipomas to avoid delaying these surgeries?
Aim: Our aim was to assess the use of ultrasound-guided infiltration anaesthesia as an alternative to general anaesthesia.
Materials and Methods: A medical ultrasound scanner was used to visualize the lipomas and ensure that the anaesthetic agent was effectively delivered beneath the lesions. The ultrasound operator controlled the probe and guided the needle under real-time imaging, while the assistant surgeon administered the anaesthetic by compressing the syringe. A mixture of 1% carbocaine with adrenaline was used. The initiative began in 2022, and after 20 successful cases involving larger lipomas, including those in the neck region, the ultrasound team shifted to an on-call support role, available as needed during procedures.
Results: Between 2020 and 2025, a total of 396 patients underwent open surgical removal of subcutaneous lipomas. In 2020, 58 patients were operated on, with 4% receiving local infiltration anaesthesia. In 2021, 43 patients were treated, with 11% receiving local anaesthesia. For 2022, the numbers increased to 69 patients, with 26% treated locally. In 2023, 121 patients were operated on, with 53% receiving local anaesthesia, and in 2024, 50 patients were treated, 66% of whom underwent surgery under local anaesthesia and in 2025 the percentage was 75 out of 55 patients. A cost analysis indicated that the average savings per case when using local instead of general anaesthesia was approx. 5,000 DKK, resulting in a total estimated saving of 580,000 DKK over the study period.
Interpretation / Conclusion: Our findings suggest that local anaesthesia can be more widely applied, even for larger lipomas and those located in the neck region. Importantly, patients are able to make an informed choice regarding their anaesthesia options. The use of local anaesthesia not only reduces costs for the hospital but also enhances patient accessibility and efficiency in surgical scheduling.

203. Early Functional Outcomes Following MUTARS® Proximal Femur Revision System

Christian Kveller[1], Sarah Stammose Freund[1], Henning Andersen [2], Thomas Baad-Hansen [1]
1. Department of Orthopaedics, Aarhus University Hospital, Denmark; 2. Department of Neurology, Aarhus University Hospital, Denmark

Background: Functional impairment following proximal femur megaprosthesis surgery remains substantial, as demonstrated in our[CK4.1] previously published study showing marked and persistent deficits in muscle strength in both extremities. Secure soft tissue attachment may be a key determinant of functional recovery. Biomechanical data from our institution suggest that porous titanium implants provide superior soft tissue ingrowth compared with Trevira® reinsertion. The MUTARS® Proximal Femur Revision System (PFRS) incorporates these characteristics, allowing in-prosthesis reinsertion of soft tissues into the endoprosthesis with a porous titanium alloy, potentially improving functional outcomes.
Aim: To assess physical function following hip resection arthroplasty and whether in-prosthesis porous titanium soft tissue reinsertion translates into improved early functional outcomes compared with traditional Trevira®-based reconstruction.
Materials and Methods: This single-center prospective cohort study consecutively enrolls newly referred patients eligible for treatment with hip resection arthroplasty - the MUTARS® PFRS being the standard at our institution. Functional outcomes are assessed at four and twelve months following surgery. Patient-reported outcomes include the PROMIS PI/PF and the MSTS score. Clinical evaluation includes assessment of joint range of motion isometric and isokinetic muscle strength over hip and knee using the Biodex System 3 PRO dynamometer and Timed Up and Go test. Outcomes will be compared with predicted normative values and with a historical cohort treated with MUTARS Proximal Femur with Trevira® derived from our previously published cohort.
Results: Enrollment is ongoing. Preliminary analyses will focus on between-group differences in muscle strength, hip function, and patient-reported outcomes, as well as recovery trajectories during the first postoperative year.
Interpretation / Conclusion: If in-prosthesis porous titanium soft tissue reinsertion in proximal femur megaprostheses translates into improved functional outcomes the results may have direct implications for implant selection and surgical strategy in complex oncologic and revision hip reconstruction.

204. Operative management of benign musculosceletal tumors in an outpatient setting - Surgical outcomes and radio-histological consistency

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Background: Benign musculosceletal tumors are extremely common but harmless from an oncological perspective. They may cause physical as well as psychological discomfort which may indicate surgical removal.
Aim: The aim of this study was to evaluate our clinical outcomes including complications after surgical treatment of benign tumors. We also sought to assess the consistency between pre-operative radiological findings and post-operative histopathological examination.
Materials and Methods: We retrospectively reviewed all procedures performed at our department of Orthopedic Surgery at North Zealand Hospital in the period of 2021-2024. All information were obtained through review of electronic patient records. Radiological assessments were compared to the Danish Data Bank for Pathology and genetic reports.
Results: 411 consecutive patient cases with a total of 478 tumors surgically removed were reviewed. 288 (61%) procedures were performed under general anesthesia while 123 under local (117 patients; 28%) or regional anesthesia (6 patients; 1%). No patients received routine antibiotic prophylaxis. 401 tumors (84%) in 340 patients were lipomas, 20 tumors (4%) were other sub-cutaneous benign tumors, 10 (2%) were osteochondromas while the remaining 47 (10%) were a wide range of benign subcutaneous elements. We found a correlation coefficient of 1.0 between preoperatively MRI-diagnosed lipomas and a rate of 0.96 between ultrasonic diagnosed lipomas and histopatholical diagnosis. All patients were discharged on the day of surgery, with a readmission rate of 0.5% (2 patients), for a total of 17 days. 7 patients (2%) were treated for postoperative infection (2 deep and 5 superficial) with no association with comorbidities found through single or multivariate analysis such as smoking, BMI or competing medical conditions ($p>0.05$ for all analyses).
Interpretation / Conclusion: Our out-patient management of benign musculosceletal tumors is safe, efficient and provide adequate care of patients without the need for hospital admission. We advocate for rational use of histopathological evaluation of MRI-diagnosed lipomas in the future to secure adequate use of resources in our health-care system.

205. Evaluation of the revision risk and risk of implant failure after diaphyseal reconstruction with intercalary spacers in orthopedic oncology patients: A multicenter Scandinavian cohort study

Mie Jensen[1], Afrim Iljazi[1], Yusuf Mustaf Ahmed Ibrahim[1], Olga Zaikova[2], Rikke Maria Lanng[3], Thomas Baad-Hansen[3], Michael Mørk Petersen[1], Christina Enciso Holm[1]

1. The Musculoskeletal Tumor Section, The Department of Orthopedic Surgery, Rigshospitalet, University of Copenhagen, Denmark; 2. Department of Oncological Surgery, Norwegian Radium Hospital, Oslo, Norway; 3. Department of Orthopedic Surgery, Tumor Section, Aarhus University Hospital, Denmark.

Background: Previous studies report variable outcome and elevated failure rate after limb-sparing surgery and reconstruction with intercalary spacers in orthopedic oncologic conditions.

Aim: Aim of the study was to determine the long-term cumulative incidence of revision surgery and implant failure.

Materials and Methods: A retrospective study including 38 consecutive patients (F/M =15/23, mean age 67 years (range 29-86 years) from three orthopedic oncology tertiary referral centers, who underwent limb sparing surgery with diaphyseal bone resection and reconstruction with intercalary spacers of the humerus (n = 10) or femur (n = 28), due to primary malignant bone lesions (n = 4) or metastatic bone lesions (n = 34) between 2000 and 2020. Patients were followed until death or end of study (31th December 2025) ensuring a minimum follow-up of 5 years. Revisions were defined as all unplanned implant-related surgeries, and implant failure was defined as removal or exchange of a bone-anchored part of the implant. The cumulative incidence of revision and implant failure was estimated using competing risk analyses (Aalen-Johansen estimator), with amputation and death as competing events.

Results: Nineteen patients (19/38; 50%) underwent revision. Femur reconstruction: the 1-year and 5-year cumulative incidence of revision was 14% (95%CI: 1-27%) and 29% (95%CI: 12-45%), respectively. Humerus reconstruction: 1- year and 5-year cumulative incidence of revision was 20% (95%CI: 0-45%) and 40% (95%CI: 10-70%), respectively. The overall primary cause for revision was aseptic loosening (13/19; 68%). Mean time to revision was 2.6 years (range 3 months -9 years). Seventeen patients (n=17/38; 45%) had implant failure. The overall risk of implant failure after 1-year and 5-year was 22% (95%CI: 8-35%) and 35% (95%CI: 20-51%). Mean time to implant failure was 2.7 years (range 39 days – 11 years).

Interpretation / Conclusion: Our results from a multicenter Scandinavian cohort of reconstructions with intercalary spacers, demonstrated a relatively high risk of revision and implant failures, primarily caused by aseptic loosening, indicating that reconstruction with intercalary spacer should be considered as a short-term solution.

206. Metastatic gastrointestinal adenocarcinoma masquerading as a primary malignant bone tumour in the humerus: a case report and review of the literature

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Background: Bone metastases from gastrointestinal (GI) adenocarcinomas are uncommon and rarely involve the appendicular skeleton. When they do, lesions may mimic primary malignant bone tumours radiologically and clinically. Accurate diagnosis requires tissue confirmation, as misclassification can result in inappropriate management.
Aim: We present the case of a 62-year-old female admitted with acute bilateral lower limb weakness, abdominal distension, and constipation.
Materials and Methods: She reported a four-month history of right arm pain and swelling. Examination revealed neurological deficits consistent with thoracic cord compression and a grossly enlarged right humerus. Radiographs demonstrated a suspicious right lung mass and an aggressive humeral lesion. CT revealed large bowel pseudo-obstruction, bilateral pulmonary emboli, a destructive T4 vertebral lesion with canal stenosis, a 20 cm expansile humeral tumour, and widespread osseous and pulmonary disease. The initial working diagnosis was a primary malignant bone tumour with systemic metastases. Ultrasound-guided biopsy of the humeral lesion confirmed metastatic adenocarcinoma, morphologically and immunohistochemically consistent with enteric/colorectal origin. Molecular profiling demonstrated absence of KRAS/NRAS/BRAF mutations, supporting potential responsiveness to anti-EGFR therapy.
Results: The patient underwent urgent thoracic decompression for spinal cord compression and was subsequently managed with systemic chemotherapy and palliative radiotherapy. She declined endoscopic evaluation of the primary site, and the consensus diagnosis was metastatic adenocarcinoma of probable colorectal origin, classified as cancer of unknown primary. Multidisciplinary supportive care, including anticoagulation, physiotherapy, dietetics, and palliative medicine, was instituted.
Interpretation / Conclusion: Metastatic GI adenocarcinoma may masquerade as a primary malignant bone tumour, particularly when presenting as a dominant appendicular lesion. Biopsy with immunohistochemistry is essential for accurate diagnosis and treatment planning. Multidisciplinary management is required to address the complex systemic and functional challenges associated with widespread disease.

207. FOCUS: Fluorescence-Guided Optimization of Sarcoma Margins

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Background: Sarcomas are rare, aggressive malignancies in which achieving negative surgical margins is critical for local control, reduced recurrence, and improved survival. However, intraoperative margin assessment remains challenging, as surgeons rely primarily on visual and tactile evaluation, resulting in positive margins in up to 20% of cases. Fluorescence-guided surgery (FGS) using indocyanine green (ICG) exploits tumor-specific vascular characteristics to enhance visualization and may improve margin assessment accuracy.
Aim: To determine whether intraoperative FGS using ICG improves the rate of negative surgical margins compared with conventional surgery in patients undergoing curative treatment of sarcomas.
Materials and Methods: A national multicenter prospective cohort study conducted at the two Danish sarcoma centers. Adult patients with biopsy-confirmed intermediate- to high-grade soft tissue sarcomas undergoing curative-intent surgery will be included. Participants will receive an IV injection of ICG 3–18 hours prior to surgery. Intraoperative imaging using a near-infrared camera system (SPY-PHI™) will guide tumor resection and identification of residual fluorescent tissue, which will be excised and analyzed histopathologically. The primary endpoint is re-resection within 30 days due to positive margins. Secondary outcomes include margin status, predictive values of fluorescence, and postoperative outcomes. The prospective cohort will be compared to a historical cohort derived from the Danish Sarcoma Database. A minimum of 88 patients is required.
Results: Enrollment is planned between 2025 and 2028 and is ongoing. No adverse effects related to ICG have been noted. Additional analyses will evaluate diagnostic accuracy measures, including positive and negative predictive values of fluorescence, as well as feasibility and safety of the technique.
Interpretation / Conclusion: FGS using ICG represents a novel adjunct for improving margin accuracy in sarcoma surgery. If effective, this approach may reduce re-resection rates and improve outcomes. The findings could have important implications for standard surgical practice and quality standards in sarcoma surgical care.

208. Neurological Status after Surgical Intervention of Intraspinal Tumors – How do we Manage Patient Expectations?

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Background: Intraspinal tumor resection is associated with significant risks. The predictors and likelihood of postoperative neurological deterioration or improvement remain inadequately defined.
Aim: We aimed to assess postoperative neurological outcome, following surgical treatment for Intraspinal tumors.
Materials and Methods: Patients who underwent resection of an intraspinal tumor between January 2017 and August 2023 were included. Through medical records we recorded preoperative neurological status, tumor location, and intraspinal pathology. Neurological outcome, measured using the McCormick score, was reassessed 10–30 months postoperatively. Using ordinal logistic regression, we assessed predictors for neurological status.
Results: A total of 271 patients were included: 61(23%) were cervical tumors, 115(42%) thoracic and 95(35%) lumbosacral. Ninety-five (35%) were schwannomas, 88 (32%) were meningiomas, 34 (13%) were myxopapillary ependymomas, and 54 (20%) various pathologies. Postoperatively, 104 (38%) improved ≥1 grade, 127 (47%) were unchanged. Of 107 patients with no prior neurological impairments, 29 (27%) deteriorated ≥1 grade, 26 of these had mild sensory symptoms and three had moderate motor deficits. Regression analyses identified poor follow-up McCormick scores as being significantly associated with; poor baseline McCormick grade (grade 3: OR 6.6, CI 2.8–15.9; grade 4: OR 10.6, CI 3–37), intramedullary location (OR 7.0, CI 2.5–22.5) and the presence of a preoperative syrinx (OR 3.5, CI 1.2–10.8). Preoperative intramedullary signal changes and tumor level (cervical, thoracic, or lumbosacral) were not associated with postoperative neurological status.
Interpretation / Conclusion: Intraspinal tumor resection primarily preserves neurological function. Patients should be advised that substantial improvement with surgery is uncommon. Patients with a worse neurological status preoperatively and with intramedullary tumors were more likely to experience a worse postoperative neurological outcome.

209. Infection Rates Following Surgical Treatment of Spinal Metastases - the Impact of Implant Material

Aya Sofia Bak[1], Nicolai Hovmand Fogh[1], Søren Morgen[1], Martin Heegaard[1], Søren Ohrt-Nissen[1], Benny Dahl[1], Martin Gehrchen[1]
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Background: Surgical site infection (SSI) is the leading cause of reoperation following surgery for spinal metastases. Carbon fiber reinforced PEEK (CFR-PEEK) implants have been proposed as an alternative to titanium, with potential differences in bacterial adhesion and biofilm formation.
Aim: We hypothesized that CFR-PEEK would reduce SSI rates compared to titanium.
Materials and Methods: This retrospective cohort study included patients undergoing surgery for spinal metastases at a single center between 2017–2024. Patients received either CFR-PEEK or titanium instrumentation. The propensity score was estimated using logistic regression including age, sex, ASA score, and BMI. Covariate balance after matching was assessed using standardized mean differences. The primary outcome was SSI requiring reoperation.
Results: A total of 372 patients were included, with 228 in the matched cohort (134 titanium, 94 CFR-PEEK). After matching, baseline characteristics were well balanced with maximum standardized mean difference below 0.1 for all covariates. Infection-related reoperation occurred in 6.7% (n=9) of titanium cases and 10.6% (n=10) of CFR-PEEK cases (p = 0.30). Logistic regression showed no significant association between implant type and infection risk (OR 1.65, 95% CI 0.64–4.24). No variables were identified as independent predictors.
Interpretation / Conclusion: CFR-PEEK implants were not associated with a reduced risk of infection compared to titanium instrumentation in patients undergoing surgery for spinal metastases.

POSTER WALK 2: TRAUMA 1

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Simon Storgaard

Per Gundtoft

Posters 210–219

210. Reoperation rates for anatomical locking plate versus tension band wiring for patella fractures

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1. Department of Orthopaedic Surgery and Traumatology, Hospital of Southern Jutland 2. Department of Orthopaedic Surgery and Traumatology, Odense University Hospital

Background: Anatomical locking plates have been promoted as a good option for patella fractures but there exists only two clinical studies comparing them to tension band wiring (TBW). One study shows a major reduction in reoperation while the largest shows no difference. When introducing a new product, clinical studies should be mandatory to assess the manufacturer's own tests.
Aim: We aim to compare reoperations rates for anatomical locking plates to TBW in adult patients with patella fractures
Materials and Methods: This two-centre retrospective study compared the treatment of 18+ year olds with AO 34-C type patella fractures during a 4-year period, 2021-2024, incl. 1 year follow-up. Patient files were reviewed for patient demographics and surgical information, while x-rays and CT-scans were reviewed for fracture classification. Anatomical locking plates were from Synthes and Arthrex, TBW was k-wires + cerclage/wire and screws+wire. Primary outcome was major reoperation (reosteosynthesis, deep infection, arthroplasty conversion, refracture, hardware removal within 12 weeks) including subanalysis on 34-C3 fractures, secondary was hardware removal.
Results: There were 88 patients with patella fractures with a median age of 67 years (range 20-90), 72% were females and CT-scan was performed in 15%. There were 33 plates and 55 TBW with no baseline difference in age, sex, diabetes, smoking or alcohol abuse. However, there were 88% C3 fractures in the plate group compared to 31% in TBW ($p<0.0001$). There were 12.1% major reoperations in the plate group (13.8% for n=29 C3 fractures) compared to 16.4% in the TBW group (17.6% for n=17 C3 fractures) yielding $p=0.61$ ($p=0.64$ for C3 fracture). There were 9.1% hardware removal in the plate group compared to 20% in the TBW group ($p=0.17$).
Interpretation / Conclusion: There were no differences in reoperation rates between anatomical locking plates and TBW including subanalysis on AO 34-C3 fractures in this retrospective cohort.

211. Feasibility of High-Density Sit-to-Stand Functional Resistance Training in Patients With Hip Fracture: A Prospective Pilot Trial

Niklas Grundt Hansen[1,2], Stig Mølsted[3,4], Søren Overgaard[4,5], Charlotte Suetta[4,6], Robin Christensen[7,8], Morten Tange Kristensen[2,4]

1. Hørsholm Municipality, Department of health and rehabilitation, Denmark, 2. Department of Physical and Occupational Therapy, Copenhagen University Hospital, Bispebjerg and Frederiksberg, 3. Department of Physiotherapy and Occupational Therapy, Hospital of North Zealand, 4. Department of Clinical Medicine - University of Copenhagen, Denmark 5. Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital, Bispebjerg, 6. Geriatric Research Unit, Geriatric Department, Bispebjerg-Frederiksberg University Hospital, Copenhagen, 7. The Parker Institute, Bispebjerg & Frederiksberg hospital, 8. University of Southern Denmark

Background: Standard rehabilitation after hip fracture emphasizes machine-based strength training, but access is limited to training centers. Sit-to-stand functional training may provide an accessible, and potentially equally effective alternative.
Aim: To examine the feasibility and tolerability of a high-density, Sit-to-stand, and the addition of two strength training programs during rehabilitation in patients with hip fracture using a three-arm sequential inclusion.
Materials and Methods: Thirty patients with a hip fracture (mean±SD age 78.0+9.6 years, 24 women) referred to municipality-based rehabilitation were included into three groups, ten participants in each group, training twice weekly for eight weeks: Group-1. Ten sets of 30-seconds all-out Sit-to-stand without using arms. Group-2: Three sets of 8-12RM leg press in addition to intervention in group-1 Group-3: Three sets of 8-12RM hip abduction in addition to intervention in group- 1 Feasibility/tolerability criteria: - Less than 20% drop-outs due to pain and/or discomfort during training. - Exercise-adherence must be 75% or more. - Hip fracture-related pain should not increase during the training and not exceed “moderate pain”. Secondary outcome: Recovery of pre-fracture mobility, measured using new mobility score.
Results: Feasibility results in group-1, 2 and 3 showed a drop-out of 10%, 40% and 0%, adherence of 82.8%, 62.3% and 84.9%, and recovery of mobility of 40%, 60% and 50%, respectively. Hip fracture -related pain did not increase in any group.
Interpretation / Conclusion: Sit-to-stand functional training initiated after hip fracture was feasible in group-1 and group-3. Group-2 failed to meet feasibility criteria. No group experienced increasing hip fracture related pain. Group-3 showed the most promising overall results on feasibility and recovery.

212. Patient-Reported Outcome Measures (PROMs) Used in Older People After Hip Fracture: Mapping What We Measure and How - A Scoping Review

Christine Krogsgaard Schrøder[1,2,3], Anne Mette Falstie-Jensen[4], Thomas Johannesson Hjelholt[3,5], Sophie Kornvig[5], Louisa Rohde Østergård, Agnes Larsen[1], Alex Bottle[6], Jensen Pia Søe[2,7,8], Kristensen Pia Kjær[1,2]
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Background: Patient-reported outcome measures (PROMs) are important in hip fracture care, reflecting independence and daily functioning. In the absence of hip fracture-specific PROMs, clinicians rely on generic or other disease-specific tools.
Aim: To identify and map the domains and items included in PROMs used to evaluate recovery after hip fracture, as well as the methods of administration applied for their collection.
Materials and Methods: Scopus, Embase, Medline and CINAHL were systematically searched. Original peer-reviewed studies reporting on the development, use, or evaluation of tools assessing PROs used after surgical treatment of hip fracture patients were included. All retrieved citations were independently screened by two authors using Covidence. Eligible studies were published in English, Danish, Swedish, or Norwegian. Grey literature was also identified from the websites of clinical quality databases and clinical guidelines. Data were extracted using a standardized form. Tools were mapped against domains and items.
Results: We included 308 studies, identifying 71 distinct PROMs. Ten domains (such as pain and function) comprising 81 items were identified and mapped. The most used generic PROM was the EQ5D, while the most used hip-related PROM was the Harris Hip Score. Questionnaires and telephone interviews were the most common methods of administration, and 15% of the included studies used proxy respondents. Reporting of response rates at different PROM collection time points was sparse and the reported response rates ranged from 11% to 100%. Only 1% of the included studies reported the time required to complete PROMs.
Interpretation / Conclusion: PROM use after hip fracture is highly heterogeneous, with no consensus on domains, items, or methods of administration. This limits comparability and clinical applicability of outcomes. By mapping all PROMs previously used, this review provides support for clinicians in selecting relevant instruments and enables future consensus-based work to guide PROM selection in hip fracture care.

213. Hospitals contacts and mortality within 30 days following humerus or pelvic fractures: Does prior home care matter?

Lisa Solgaard Nøhr[1,2], Jesper Lindberg Jensen[2], Martin Gade Stisen[1,2,4], Lone Winther Lietzen[1,3], Inger Mechlenburg[1,2], Pia Kjær Kristensen[1,2]

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Background: Evidence on short-term outcomes following humerus and pelvic fractures remains limited. Frailty is a major determinant of mortality and readmission but is not routinely assessed in this population. Pre-fracture home care may serve as a pragmatic indicator of frailty and facilitate identification of patients at higher risk of adverse outcomes.

Aim: To investigate 30-day mortality, all-cause hospital contacts, and potentially preventable readmissions, among patients with humerus and pelvic fractures, and assess whether pre-fracture home care is associated with these outcomes.

Materials and Methods: A population-based cohort study using data from the CROSS-TRACKS cohort identified patients aged ≥65 years with non-surgically treated humerus or pelvic fractures (2012-2022). Pre-fracture home care was defined as personal care, practical help, or nursing care provided six months prior to the fracture. 30-day mortality was estimated using the Kaplan-Meier method. All-cause hospital contacts and potentially preventable readmissions within 30 days were presented as proportions. Cox regression, adjusted for sex, age, and Charlson Comorbidity Index, evaluated associations between pre-fracture home care and 30-day outcomes.

Results: We included 7,172 patients with humerus fractures and 4,396 with pelvic fractures. 30-day mortality was 3.2% for humerus and 6.4% for pelvic fractures. In patients with humerus fractures, pre-fracture home care dependence was associated with increased 30-day mortality (8.3% vs. 1.6% adjusted Hazard Ratio (aHR) 2.48, 95% CI 1.36–4.55), inpatient admissions (9.3% vs. 5.5% aHR 1.60, 95% CI 1.02–2.49), and potentially preventable readmissions (22.0% vs. 15.9% aHR 1.44, 95% CI 1.11-1.91) compared to independent patients. In patients with pelvic fractures, it was associated with increased inpatient readmissions (15.2% vs. 9.3% aHR 1.79 95% CI 1.13–2.83).

Interpretation / Conclusion: Older adults with humerus or pelvic fractures had high 30-day mortality, all-cause hospital contacts, and potentially preventable readmissions. Patients dependent on pre-fracture home care had increased risks, highlighting the need for targeted interventions.

214. Ninety-Day Costs of Incident Fractures in Finland: Direct Healthcare Costs and Productivity Losses, 2012–2018

Jere Hytönen[1], Elina Ekman[2,3], Mika Kortelainen[4,5], Aleksi Reito[6]
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Background: Bone fractures impose a substantial economic burden on healthcare systems and society through direct treatment costs, including surgery, operating room use, inpatient care, and medications, together with productivity losses and increased morbidity. However, the total economic impact of fractures has not been comprehensively quantified.
Aim: The aim is to describe acute-phase costs associated with incident fractures within 90 days post-fracture, including direct healthcare costs and indirect productivity losses, in the Finnish population from 2012 to 2018.
Materials and Methods: The Finnish Care Register for Health Care (FCR) was used to identify all adult patients (≥18 years) treated for orthopaedic fractures, both operatively and nonoperatively, between 2012 and 2018. Data from the FCR, the Finnish Prescription Register, and the Finnish Sickness Allowance Register were used to extract information on fracture procedures, length of hospital stay, sickness absence, and prescribed medications. For operatively managed fractures, all cost components were included, whereas for nonoperatively managed fractures, data were limited to prescribed medications and sickness absence. Unit costs derived from three Finnish tertiary care hospitals and one central hospital were applied to estimate annual costs.
Results: Total annual acute phase costs of incident fracture care were highest in 2013 (251.9 million euros) and lowest in 2014 (230.1 million euros). The average total annual cost was 240.1 million euros. Direct healthcare costs represented 61.4 % (147.3 million euros) and indirect productivity losses 38.6 % (92.77 million euros) of the total burden.
Interpretation / Conclusion: Costs associated with incident fractures remained relatively stable in the Finnish adult population between 2012 and 2018. During this period, total healthcare expenditure in Finland ranged from €18 to €21 billion, with 90-day fracture-related costs accounting for over 1% of overall spending, representing a substantial share.

215. Association between haemoglobin on admission and mobility after hip fracture surgery and 90-day mortality; A 1-year cohort of 380 patients

Nicolas Tekin Jones[1,2], Camilla Kampp Zilmer[3], Theresa Bieler[3], Søren Overgaard[1,2], Martin Aasbrenn[2,4], Morten Tange Kristensen[2,3]

1. Department of Orthopaedic Surgery and Traumatology, Copenhagen University Hospital, Bispebjerg, Copenhagen, Denmark. 2. Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark. 3. Department of Physical and Occupational Therapy, Copenhagen University Hospital, Bispebjerg and Frederiksberg, Copenhagen, Denmark. 4. Department of Geriatric and Palliative Medicine, Copenhagen University Hospital, Bispebjerg and Frederiksberg, Copenhagen, Denmark.

Background: Patients with a Hip fracture (HF) are associated with adverse health outcomes. However, evidence on whether mobility or anaemia is a stronger predictor of mortality, is limited.
Aim: We examined the influence of anaemia before surgery and post-operative mobility and on 90-day mortality after HF.
Materials and Methods: We included patients with a HF, ≥65 years, at the first physiotherapy contact after surgery admitted from May 2022 through April 2023 at an orthogeriatric department. Haemoglobin was from admission and mobility evaluated with Cumulated Ambulation Score (CAS, 0-6 points) after surgery. Patients were included at the first physiotherapy contact after surgery. Anaemia was according to WHO; haemoglobin <12 g/dL (<7.5mmol/L) for women and <13 g/dL (<8.1mmol/L) for men. Reduced mobility was CAS<3 points corresponding to non ambulatory, transfer dependent. The day of CAS assessment was used as index for 90-day mortality in adjusted Cox regression analysis (aHR) including Hgb (anaemia vs. no anaemia), CAS<3 vs. CAS3-6, age, sex and the M3-index for multimorbidity.
Results: A total of 380 patients (mean±SD age 82±8.5y, 72% women) fulfilled the criterions over the period, of whom 161 (42%) had anaemia and 222 (58%) had CAS<3 points. Within 90-days of inclusion 13% (n=51) had died, but 21.1% and 7.8% for those with anaemia vs. no anaemia before surgery, respectively. For CAS<3 the 90-day mortality was 18.5% vs. 6.3% for CAS3-6. The HR of 90-day mortality for patients with anaemia was 1.91 (95%CI, 1.04-3.50, p=0.037) and 2.33 (95%CI, 1.15- 4.72, p=0.018) for CAS<3 points.
Interpretation / Conclusion: Among patients with a HF, the 90-day mortality significantly increases with both anaemia on admission and lower basic mobility early after surgery. We suggest studies evaluating if reducing anaemia throughout the perioperative phase and increasing mobility improves outcomes after HF.

216. Socioeconomic Inequality in Initiation of Anti-Osteoporosis Medication after Hip Fracture Surgery

Luise Bové Thisgaard[1,2], Jonas Vejsig Hansen[1,2,3], Rikke Sommer Haaber[1,2], Simon Storgaard Jensen[1,2], Inger Mechlenburg[2,3], Alma Becic Pedersen[1,2]
1. Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark; 2. Department of Clinical Medicine, Aarhus University, Aarhus, Denmark; 3. Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus, Denmark.

Background: Patients sustaining a low-energy hip fracture are at high risk of subsequent fractures and associated mortality. Still, initiation of anti-osteoporosis medication (AOM) for secondary fracture prevention after a hip fracture remains suboptimal. Although socioeconomic position (SEP) is associated with disparities in hip fracture outcomes, its impact on initiation of AOM after hip fracture has not been fully investigated.
Aim: To investigate the association between SEP markers and initiation of AOM after hip fracture surgery.
Materials and Methods: We conducted a Danish cohort study including patients aged ≥50, with a first hip fracture between 2010-2020 and no recent AOM use. SEP markers were assessed by highest attained education, cohabitation status, household wealth and labour market affiliation. AOM was defined by hospital treatment codes and redeemed prescriptions. We estimated one-year cumulative incidence functions (CIF) by the Aalen-Johansen method with death as a competing risk. Cause-specific Cox regression models were used to estimate hazard ratios (HR) adjusting for sex and age. All estimates are presented with 95% confidence intervals (CI).
Results: A total of 62,219 patients were included. Overall, one-year CIF of AOM initiation after hip fracture was 18% (CI 18-19). Initiation of AOM differed across SEP markers, with lower CIF among patients with low education (19%, CI 18-19), living alone (16%, CI 16-16), low wealth (17%, CI 16-18) and not working (16%, CI 15-17) compared to patients of high education (22%, CI 21-23), cohabiting (22%, CI 22-23), high wealth (21%, CI 21-22) and working (24%, CI 23-26) or retired (18%, CI 18-19). HRs of AOM initiation were 0.88 (CI 0.83-0.93) for low education, 0.76 (CI 0.73-0.79) for living alone, 0.75 (CI 0.70-0.79) for low wealth, and 0.68 (CI 0.61-0.75) for patients not working compared to high education, cohabiting, high wealth and working.
Interpretation / Conclusion: Initiation of AOM after hip fracture was suboptimal, reflecting missed opportunities for secondary fracture prevention. Lower initiation rates among patients with lower SEP indicate inequities in post-fracture care, and a need for targeted follow-up, to ensure equitable access to evidence-based treatment.

217. Hypothermia in patients with hip fractures is common, overlooked and risky

Julia Lundgren[1], Helmi-Sisko Pyrhönen[1,2], Max Andersson[2], Manne Holm[3], Linnea Malmgren[1,4], Cecilia Rogmark[1,2]

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Background: Hypothermia, defined as core temperature below 36°C, is common in patients with hip fractures. Risk factors include high age, frailty, and low BMI. Consequences include delayed wound healing, increased risk of bleeding, cardiovascular events, and increased 30-day mortality. Active forced air warming should be started at the ward pre-surgery, and frequent measurements should be done to ensure euthermia.
Aim: This study aimed to examine the prevalence of hypothermia in hip fracture patients aged 65 years or older, and any association with risk of dying. Moreover, we aimed to evaluate the clinical awareness in nursing staff regarding both factual parts and practical interventions for hypothermia.
Materials and Methods: In a prospective observational study, patients aged 65 years and older with hip fractures were eligible to join. Temperature readings were done daily at the ward. Mortality was followed up for one year from admission. Additional data about gender, age, frailty and BMI was also collected. Primary outcomes were 30-day and 1-year mortality. The data was analysed through uni- and multivariable regression in SPSS. A case-based survey was also sent out to nursing staff where they were asked to suggest interventions for hypothermia, together with a shorter quiz about definition, risk factors and consequences.
Results: 637 patients were included. 16% of patients experienced hypothermia sometime during their course of care. Being hypothermic had a 5.2 increase in the odds for 30-day mortality (95% CI 1.8-15, $p < 0.05$) and a 2.4 increase in odds for 1-year mortality (95% CI 1.3-4.4, $p < 0.05$), when adjusted for age, BMI, gender and frailty. When presented for a fictive case of hypothermia in association with hip fracture care, only 35% of nursing staff suggested warming procedures in line with the guidelines.
Interpretation / Conclusion: Hypothermia is common in patients with hip fracture and is associated with an increase in both 30-day and 1-year mortality. The clinical awareness in nursing staff seems to be poor, and few seem to follow the clinical guidelines. Our results reveal a room for improvement of care.

218. Comparing perioperative reduction quality for pertrochanteric fractures treated with intramedullary nail – blade vs. screw

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Background: When performing surgery with intramedullary nails for pertrochanteric fractures (PF), there are two major types of implant design for the femoral neck fixation – either a screw or a blade. There could be different fracture positioning after implantation as the technique for insertion differs significantly between the two.
Aim: The aim of this study was to compare the perioperative fracture reduction in patients with PF treated with either a screw (Gamma3 Trochanteric Nail (GTN3)) or a blade (Trochanteric Fixation Nail Advanced Proximal Femoral Nailing System (TFNA)) as the femoral neck fixation design.
Materials and Methods: This single-center retrospective cohort study included patients treated for PF with a nail between 01.01.2024 – 31.03.2025. In August 2024, the standard treatment of PF shifted from the GTN3 (screw) to the TFNA (blade). All surgeries were performed or supervised by orthopaedic specialists. Data were extracted from the hospital's administrative system and journal chart review. The X-ray images were measured for reduction quality using Chang Reduction Criteria (primary outcome) incl. fracture alignment, displacement, gap and tip-apex distance. Sample size calculation was set to a 2% vs. 10% difference in poor reduction quality requiring 270 patients.
Results: There were in total 274 PF, median age of 84 (range 65-100) and 65% female. There were no statistical differences in baseline on age, sex, cognitive status, living conditions, length of stay, and fracture classification between GTN3 (n=139) and TFNA (n=135), but the 30-day mortality was 15.8% in GTN3 compared to 5.9% in TFNA (p=0.009). There was no statistical difference in the reduction quality with 67% excellent reduced in the GTN3 group compared to 76% in the TFNA group (p=0.114). There were no statistical differences in AP alignment (p=0.309) and displacement (p=0.470), lateral alignment (p=0.162) and displacement (p=0.174), or fracture gap (p=0.907) and tip-apex distance (p=0.348). There was no difference in 1-year reoperation (p=0.576).
Interpretation / Conclusion: No significant difference in perioperative reduction quality was found between intramedullary nails using a screw and those using a blade for PF.

219. Effectiveness and Cost-Effectiveness of Advanced Practice Physiotherapy for Patients with Musculoskeletal Injuries in the Emergency Department: Protocol for a Multicentre Controlled Clinical Trial

Louise Mortensen[1,2], Nikolaj Raaber [3,5], Per Hviid Gundtoft [4,5], Inger Mechlenburg [4,5], Francois Desmeules [6,7,8], Johanna Van Dongen [9], Nanna Rolving [1,2,10]

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Background: Musculoskeletal disorders and injuries (MSKDs) are among the most frequent reasons for emergency department (ED) visits. These patients often need assessment, imaging decisions, pain management, and discharge advice, yet they compete for time and resources in already crowded EDs. This pressure increases waiting times and limits capacity for more urgent cases. Advanced Practice Physiotherapy (APP) offers a practical solution. In this model, physiotherapists act as first-contact clinicians for selected MSKDs. International studies show shorter waiting times, increased flow, high patient satisfaction, and diagnostic and treatment accuracy comparable to physicians.

Aim: To evaluate the effect and cost-effectiveness of an APP care model compared with usual ED physician care for patients referred to the ED with MSKDs, using patient-reported outcomes and registry-based data.

Materials and Methods: This multicentre quasi-randomized controlled trial with cost analysis will include 800 patients presenting with minor MSKDs. Allocation will follow alternating days, balanced across weekdays and weekends. Patients in the intervention group will be assessed, diagnosed, treated, and discharged by an APP. The control group will receive usual care from an ED physician and/or nurse. Outcome measures will be collected electronically at the ED visit (pre-injury status) and after 1, 4, 12, and 26 weeks. Patient-reported outcomes include pain interference (Short Form Brief Pain Inventory), pain intensity (VAS), upper or lower extremity function (PROMIS), work status (WPAI-GH), health-related quality of life (EQ-5D-5L), and patient satisfaction (VSQ-9). Healthcare use, medication use, hospitalisation, adverse events, and return ED visits for the same complaint will also be recorded. The primary outcome is between-group difference in pain interference at 12 weeks.

Results: Final results are expected in 2028.

Interpretation / Conclusion: This trial will test whether APP-led care for MSKDs improves patient outcomes and lowers healthcare costs compared with usual physician- or nurse-led care. The findings can guide future organisation of orthopedic and musculoskeletal emergency care in Denmark and similar healthcare systems.

POSTER WALK 3: TRAUMA 2

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Ida Tryggedsson

Ilija Ban

Posters 220–229

220. Haemoglobin And Transferrin Saturation Are Associated With Mobility And Physical Function Two Months After Hip Fracture Surgery: An Observational Cohort Study

Nicolas Tekin Jones[1], Aasbrenn Martin[2], Camilla Kara Svensson [3], Marie Wes Pedersen t[4], Nicolai Jensen [4], Sune Pedersen [5], Luana Sandoval Castillo [3], Thomas Giver Jensen [1], Troels Haxholdt Lunn [6], Eckart Pressel [3], Henrik Palm [7], Søren Overgaard [7], Charlotte Suetta [2], Morten Tange Kristensen [8]

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Background: Approximately 50% of patients with hip fracture do not regain their mobility within a year. Anaemia is common after hip fracture (HF) and may impair muscle oxygen delivery, potentially limiting function—particularly in frail patients at risk of losing independent mobility. Maintaining independence in daily activities is essential, yet the longer-term impact of anaemia on mobility is unclear.
Aim: To Investigate if haemoglobin and transferrin saturation two months after discharge for HF were associated with mobility and functional outcomes.
Materials and Methods: We included patients ≥65 years surgically treated for HF at Copenhagen University Hospital, Bispebjerg and Frederiksberg. Iron deficiency was defined as transferrin saturation (TSAT) <20%. Physical function was assessed two months post-discharge using the New Mobility Score, six-minute walk test, usual walking speed, 30-second Sit-to-Stand test, and handgrip strength. Associations between haemoglobin, TSAT (per 10% increase), and outcomes were analysed with multivariable linear regression adjusted for age, sex, and fracture type.
Results: Two-hundred-and-thirty-five patients were included (69% women, age 80±8 years, 55% had intracapsular fractures). The average ±SD haemoglobin two days after discharge was 10.4±1.5 g/dL, 91% had anaemia. The average transferrin saturation two months after surgery was 0.21±0.09, 51% had iron deficiency. High haemoglobin was associated with high new mobility score (B=0.46, 95% CI 0.25- 0.66, p<0.001). High transferrin saturation was associated with high new mobility score (B=0.74, 95% CI 0.17-1.31, p=0.01), six-minute walk test (B=47, 95% CI 16-78, p=0.004), walking speed (B=0.12, 95% CI 0.06-0.19, p<0.001), 30-second Sit-to-Stand test (B=1.56, 95% CI 0.30-2.85, p=0.01), and hand grip strength (B=2.1, 95% CI 0.0-4.2, p=0.049).
Interpretation / Conclusion: High haemoglobin two days after discharge was associated with high New Mobility Score two months after surgery. Transferrin saturation was associated with mobility and all measured functional outcomes two months after hip fractures. This calls for studies investigating clinical interventions that increase haemoglobin and iron availability after HF and enhance long term functional recovery.

221. Recovery after Pelvic Fractures - Mortality and change in Healthcare Utilization

Jesper Lindberg Jensen[1], Lisa Solgaard Nøhr[1], Pia Kjær Kristensen[1,2], Lone Winther Lietzen[1,3], Inger Mechlenburg[1,2,4], Martin Gade Stisen[1,2,5]

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Background: Pelvic fractures are common in older adults and are associated with pain, impaired mobility, reduced quality of life, and increased mortality. Recovery is often limited, with many patients not regaining pre-injury function, and healthcare utilization frequently increases. Despite this, no widely accepted guidelines for post-fracture care exist. A better understanding of mortality risk and healthcare utilization is needed to inform care pathways

Aim: This study investigates one-year mortality and identify pre-fracture risk factors associated with mortality. Further, it examines changes in healthcare utilization and associated risk factors across hospitals, municipalities, and primary care before and after the fracture.

Materials and Methods: Patients aged ≥65 years with a pelvic fracture were identified from the CROSS-TRACKS cohort. One-year mortality was analysed using Kaplan-Meier and Cox regression, adjusting for sex, age, Charlson Comorbidity Index (CCI), civil status, and residential status. Changes in hospital contacts, municipal services, and primary care contacts were assessed using paired t-tests, and their associations with sex, age, CCI, civil status, and residential status were examined using multiple linear regression.

Results: One-year mortality was 22.4% (95% confidence interval (CI) 21.2; 23.7). Male sex, older age, higher CCI, nursing home residency, and living alone were associated with increased mortality risk after pelvic fracture. From the year before to the year after the fracture, hospital contacts increased by a mean of 1.1 (95% CI 0.9; 1.3), municipal services by 393 (95% CI 307; 479), and primary care contacts by 5.9 (95% CI 5.2; 6.7). Older age and higher CCI were associated with increased healthcare utilization.

Interpretation / Conclusion: High one-year mortality and increased healthcare utilization were found after pelvic fractures. Male sex and high CCI were associated with increased mortality, while older age was associated with both increased mortality and greater change in healthcare utilization. Coordinated cross-sector care is essential for this aging population.

222. Quality of closed reduction in dorsally displaced distal radius fractures: a comparison between 2005 and 2019

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Background: Closed reduction and casting remain standard initial treatment for dorsally displaced distal radius fractures (DRFs). However, surgical treatment rates have increased substantially over the past decades despite limited evidence of improved outcomes. Whether the quality of closed reduction has changed over time is largely unknown.
Aim: To compare the radiological quality of closed reduction in dorsally displaced DRFs between 2005 and 2019.
Materials and Methods: This retrospective cohort study included adult patients with dorsally displaced, closed, low-energy DRFs treated with closed reduction and casting at a single tertiary centre. Radiographs from 2005 and 2019 were reviewed. Dorsal tilt was measured before and after reduction, and at first follow-up. The primary outcome was change in dorsal tilt. Secondary outcomes included maintenance of reduction and treatment method. Cohorts were compared using t-tests and chi-square tests.
Results: A total of 387 fractures were included (147 in 2005 and 240 in 2019). Mean age was 64 years (median 64, SD 18, range 20–97) in 2005 and 63 years (median 66, SD 16, range 18–96) in 2019, with no statistically significant difference between cohorts (t-test, p p = >0.9). There were no statistically significant differences between cohorts regarding sex distribution or functional status (working age, retired, nursing home) (χ^2 test, all $p > 0.05$). Left-sided fractures accounted for 56% in 2005 and 60% in 2019. Baseline dorsal angulation was greater in 2019 compared with 2005 (26.7° vs 22.0°, $p = 0.002$). Despite this, post-reduction angulation was significantly lower in 2005 than in 2019 (2.4° vs 8.9°, $p < 0.001$). Maintenance of reduction at first follow-up was comparable between groups, while surgical treatment rates were higher in 2019.
Interpretation / Conclusion: The quality of closed reduction in dorsally displaced distal radius fractures appears to have decreased over time. Despite greater initial deformity in 2019, post-reduction alignment was inferior compared with 2005. This may contribute to the increasing use of surgical treatment and highlights the importance of maintaining high standards in non-operative fracture management.

223. Reliable risk factors for hemiarthroplasty dislocations after acute femoral neck fracture; a systematic literature review and meta-analysis

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Background: Dislocation is a well-known complication to hip hemiarthroplasties (HA) following femoral neck fracture (FNF). Risk factors for dislocation are reported divergently across the literature and available reviews are often based on studies with unverified dislocations and/or underreporting.
Aim: To identify reliable risk factors for dislocation of HAs after acute FNFs.
Materials and Methods: We conducted the review in accordance with the PRISMA guidelines, and developed a search strategy for Embase, MEDLINE, PubMed, and the Cochrane Library with a research librarian. We defined a reliable risk factor for dislocation if being reported in a minimum of five papers with a minimum of 10 dislocations per paper. The screening, data extraction and quality assessment were performed by two independent reviewers. ROBINS-E, or -I were used as quality assessments in non-RCTs and RoB-2 were utilized in RCTs. Meta-analyses were performed if there were at least three RCTs or five cohort-studies, and sufficient data.
Results: The literature search identified 1,980 papers and 26 studies met the inclusion criteria with a total of 83,002 HAs with 2,386 dislocations. Most studies were of poor quality, mainly due to high risk of bias (confounding and missing data). Three potential reliable risk factors for dislocation were identified; acetabular dysmorphology (n=12), posterior approach (n=11), and cognitive impairment (n=10). The meta-analysis showed that cognitive impairment had an OR of 1.85 (1.09 – 3.13) but with substantial heterogeneity of 68% among the studies, measured as the true difference in effect sizes. A smaller center edge angle had an OR of 1.37 (0.82 – 2.26) and high heterogeneity (97%). Posterior approach was reported as a significant risk factor for dislocation in 11 papers, but meta-analysis could not be performed due to missing data. In the screened literature, 10 additional, but non-reliable, risk factors were reported.
Interpretation / Conclusion: Posterior approach and cognitive impairment were identified as reliable risk factors for dislocation in HAs while there were in total 11 non-reliable risk factors. Acetabular dysmorphology was analysed as a reliable risk factor but was excluded due to the results of the meta-analysis.

224. Burden of orthopedic trauma care in Northern Malawi. An epidemiologic study

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Background: Malawi is a low-income country in sub-Saharan Africa with a population of approximately 21 million. The trauma burden is massive and resources for care is sparse. One single orthopedic surgeon provides service to a population of 4 million in the northern Malawi
Aim: To provide epidemiological data on orthopedic trauma care in Northern Malawi
Materials and Methods: Retrospective chart review of all performed musculoskeletal radiographs (1 month-period), inpatient ward records and theatre logbooks over a period of two-months in 2025
Results: Over 30 days, 440 patients (244 adults and 196 children) with a fracture were presented to the hospital. 56% of the adult fractures would have benefitted of surgical management compared to 20% in the children group. On average 6 patients (4.6 adults and 1.3 children) would benefit of surgery on a daily base. Tibia shaft, forearm, wrist and femur shaft fractures were most common in adults whereas wrist and distal humerus fractures were predominant in the children. 176 patients had been admitted during a two-month period. Most due to trauma (80,7%) or infection (16,5%). Most common mechanism of trauma injury was road traffic accidents (43.7%), falls (30.3%) and assaults (9.8%). The median time from admission to theatre treatment was 13 days. Theatre lists ran 3 days a week with 216 procedures done on 199 patients over a two-month period, resulting in a daily surgical capacity of 3.6 procedures. Adults getting operated were on average 37 years old and predominantly males (65.1%). 19% of all fractures treated were open. Most common anatomical site was tibia shaft fractures (23%)
Interpretation / Conclusion: Orthopaedic trauma places a substantial and unmet demand on surgical services in northern Malawi. Current operative capacity in North Malawi is insufficient to meet the volume of injuries presenting, particularly among economically productive adults. Addressing this gap will require targeted improvements in theatre capacity and data systems, alongside strengthened support and supervision of Orthopaedic Clinical Officers. Improving access to timely orthopaedic surgery is essential to reduce preventable disability and its broader social and economic consequences in this underserved region.

225. True incidence of hip dislocation after hip hemiarthroplasty – a nationwide study based on Danish registers

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Background: The incidence of hip hemiarthroplasty (HA) dislocations is difficult to determine accurately for several reasons. Reduction of a dislocated HA is performed as a quick, closed procedure, either in the emergency department or at the operating theater and may not be reported correctly. A specific ICD-10 diagnostic code does not exist, and miscoding of both diagnostic and the procedural code is prone to occur, and validation of the existing coding in the Danish National Patient Registry (DNPR) has not been performed so far. To determine the true incidence of HA dislocation following femoral neck fracture (FNF), thorough review of a large, nationwide sample of HA patients is needed, which will allow for subsequent coding validation and complication monitoring in a register setting.
Aim: To determine the true incidence of dislocations in acute FNF patients treated with a HA within one year after index surgery.
Materials and Methods: This was a nationwide, retrospective cohort study based on register data regarding Danish patients with acute FNFs, who have received a HA. We identified 17,055 HAs between 2017 and 2021 in the Danish Multidisciplinary Hip Fracture Register and the DNPR. Follow-up was one year from index-surgery. Dislocations were identified by extraction of all hospital contacts from the DNPR and validated during a comprehensive nationwide review of medical files from 7,250 contacts to the healthcare system.
Results: We identified 639 dislocations through nationwide review of medical journals. In the years 2017 – 2021 the one-year dislocation rate is 3.7%. This number will most likely be lower, since the numbers cannot discriminate between first-time dislocations and recurrent dislocations. The final analysis will include cumulative incidence, risk factor analysis and a validation – or rejection of an algorithm created for extracting dislocations through DNPR.
Interpretation / Conclusion: The one-year dislocation rate after HAs was estimated to be 3.7%, but variation between regions, hospitals, surgical approach and different prostheses designs may occur.

226. Association between Socioeconomic Position and Early Mobilisation after Hip Fracture Surgery: A Nationwide Cohort Study

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Background: Early mobilisation within 24 hours after hip fracture surgery is a key quality indicator in Danish hip fracture care and is associated with reduced complications and mortality. Despite this, not all patients are mobilised within the recommended timeframe. Socioeconomic disparities in outcomes after hip fracture are well documented, but it remains unclear whether socioeconomic position (SEP) is associated with early postoperative mobilisation.
Aim: To examine the association between SEP and early mobilisation after hip fracture surgery.
Materials and Methods: We conducted a Danish nationwide register-based cohort study of patients aged ≥65 years undergoing first-time hip fracture surgery between 2016 and 2021. SEP was defined by cohabitation status, wealth, and educational attainment. Early mobilisation was defined as mobilisation within 24 hours after surgery. Associations between SEP and early mobilisation were analysed using modified Poisson regression to estimate risk ratios (RRs) with 95% confidence intervals (CIs), adjusted for age and sex.
Results: We included 35,533 patients, of whom 75% were mobilised within 24 hours. Across SEP groups, the proportion of patients mobilised within 24 hours ranged from 72.6% to 78.0%, an absolute difference of 5 percentage points. Early mobilisation was more frequent among cohabiting patients than among those living alone or in nursing homes. Compared with cohabiting patients, patients living alone were less likely to be mobilised early (73.9% vs 78.0%; RR 0.95 (CI 0.93–0.96)), and similarly for patients living in nursing homes (73.9% vs 78.0%; RR 0.95 (CI 0.93–0.96)). Patients in the lowest wealth group had a lower probability of early mobilisation compared with those in the highest wealth group (72.6% vs 75.2%; RR 0.96 (CI 0.94–0.98)), while the middle wealth group had a similar probability (RR 1.01 (CI 1.00– 1.03)). Probability of early mobilisation was similar across educational groups.
Interpretation / Conclusion: Living alone, nursing home residence, and lower wealth were associated with a reduced probability of early mobilisation, while no difference was observed by educational attainment. These findings indicate socioeconomic disparities in a key postoperative quality indicator.

227. Has one decade of clinical improvements decreased the rate of complications after a hip fracture?

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Background: Reducing complications after hip fracture is essential to improve functional recovery, quality of life and survival.
Aim: The aim of this study is to describe the prevalence of complications after hip fracture surgery, compared to the department's historical data (1). 1. Hansson S, et al. Complications and patient-reported outcome after hip fracture. A consecutive annual cohort study of 664 patients. Injury (2015)
Materials and Methods: In an observational cohort study, patients ≥65 years with a surgically treated hip fracture 01.02.2023 – 31.08.2024 were prospectively included. Patients were followed for 1 year. Medical complications were limited to 30 days to ensure relationship with fracture. All data was collected through systematic chart review and analyzed using SPSS Statistics.
Results: Of 637 included patients, 324 (51%) had an intracapsular, 262 (41%) a pertrochanteric and 51 (8.0%) a subtrochanteric fracture. 24% of patients with an intracapsular fracture received internal fixation, and 76% arthroplasty. Compared to a cohort from our hospital (n=664), we noted the same rate of deep infections (2.4 vs 2.3%) and periprosthetic fractures (1.3 vs 1.2%), year 2011 vs 2023-24, respectively. Dislocations increased from 0.5 to 1.3%, whilst non-union decreased from 2.0% to 0.2%. The most common medical complications were postoperative anemia (40%), confusion (34%) and urinary tract infection (11%). The historical cohort registered fewer types of complications, for 6 months postoperatively, making comparisons more uncertain. Nevertheless, we noted a decrease in cases of pneumonia, 4.9% compared to 11% in 2011. The numbers were similar för deep vein thrombosis (0.9 vs 1.2% in 2011) and pulmonary embolism (1.7 vs 1.8% in 2011). 30-day and 1-year mortality rates were 5.5% and 25%, compared to 24% at 1-year in 2011. Men had higher mortality; 7.2 and 28% (30-day and 1-year) vs 4.7 and 23% for women.
Interpretation / Conclusion: No clear reduction in complications and mortality rates during the last decade was seen. There were more dislocations, in spite of same surgical approach and share of arthroplasty cases. Non-unions decreased. There may be a reduction in cases of pneumonia, with the caveat of longer follow-up in the 2011 cohort.

228. Preoperative Anemia Subtypes and Blood Transfusion as Predictors of 90-Day Mortality and Readmission After Hip Fracture Surgery: A Retrospective Cohort Study

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Background: Preoperative anemia (POA) is frequent in hip fractures, yet the impact of specific subtypes on outcomes is uncertain.
Aim: This study investigates the association of POA subtypes and blood transfusions with 90-day mortality and readmission.
Materials and Methods: This retrospective cohort study included 2,613 consecutive hip fracture procedures from a single center performed between 2021-2025. Patients were categorized as anemic (WHO criteria) or non-anemic. Routine full blood profiles, available from 2023, enabled subclassification into: Absolute Iron Deficiency Anemia (IDA), Anemia of Chronic Disease/Functional IDA (ACD), B12/Folate Deficiency, and Other/Unexplained. Multivariable logistic regression estimated odds ratios (aOR) for 90-day outcomes, adjusting for age, sex, time to surgery, surgery duration, and operation type.
Results: Overall, 1,882 (72%) had POA. A full profile evaluated 1,238 patients: IDA (n = 610), ACD (n = 371), B12/Folate Deficiency (n = 25) and Other/Unexplained (n = 232). POA compared to patients without anemia was independently associated with higher 90-day mortality (aOR: 1.48; 95% CI: 1.15-1.92) and readmission (aOR: 1.38; 95% CI: 1.12-1.72). Specific subtypes dictated distinct risk profiles: IDA was associated with higher odds of mortality (aOR: 1.37; 95% CI: 1.00-1.88; p = 0.05). Among IDA patients, blood transfusion was associated with a higher risk of mortality (aOR: 3.45; 95% CI: 2.08-5.69; p < 0.01). Furthermore, a dose-response relationship was observed for the anemic patients, where receiving ≥ 5 blood units was associated with the highest odds of mortality (aOR: 6.59; 95% CI: 1.87-22.45; p < 0.01).
Interpretation / Conclusion: Preoperative anemia and blood transfusions are independently associated with adverse outcomes after hip fracture surgery. Risk profiles vary significantly by etiology: Absolute Iron Deficiency Anemia correlates with higher mortality—particularly in transfused patients—while ACD is linked to increased readmissions. These findings highlight the clinical relevance of anemia subtypes and underscore the need for prospective interventional trials to determine if targeted anemia management can improve outcomes.

229. Recovery of pre-fracture mobility and frailty status in older patients one year after surgery for hip fracture: A prospective cohort study of 47 patients from a single municipality

Camilla Kampp Zilmer[1], Anja Løve Berger [1], Søren Overgaard [2,3], Thomas Giver Jensen [2], Henrik Palm [2], Charlotte Suetta [3,4], Martin Aasbrenn [3,4], Morten Tange Kristensen [1,3]
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Background: Hip fractures in older adults often lead to long-term functional decline. Patients prioritize recovery of mobility and confidence in movement without fear of falling rather than surgical outcomes alone. Recovery varies widely, and frailty and fear of falling are alongside mobility important factors influencing long-term function. However, evidence on these outcomes one year after hip fracture surgery remains limited.
Aim: To examine recovery of pre-fracture mobility, frailty status and fear of falling in patients with hip fracture one year after surgery.
Materials and Methods: Patients were followed for 1-year after surgery for an acute hip fracture. Recovery of functional mobility and frailty was evaluated with the New Mobility Score (NMS, 0-9 points) and the Clinical Frailty Scale (CFS, 1-9 points), respectively one year after surgery. Fear of falling was evaluated with the Short-Falls-Efficacy-Scale (S-FES, 7-28 points).
Results: Forty-seven out of 53 home-dwelling patients (mean±SD age of 81.3±6.9 years, 39 women and 23 with a trochanteric hip fracture) were followed for 1-year (6 died during follow-up). At pre-fracture, 34 of patients (72%) had a moderate to high functional mobility (NMS=7- 9). Thirty-four patients (72%) were discharged to a 24-hour care setting in the municipality, 13 patients were discharged directly to their own home. At 1-year, 23 patients (49%) had fully regained their pre-fracture NMS-level, CFS-status was worsened for 30 patients (64%), while half of patients (22/43, data missing, n=4) expressed moderate to high concern of falling (S-FES≥9). NMS recovery was significantly better (77% vs. 38% p=0.02) in those returning directly to own home vs. discharged to 24-hour care settings.
Interpretation / Conclusion: One year after hip fracture surgery, only half of patients regained pre-fracture functional mobility, frailty status was stable for about one-third, otherwise reduced, and about half of patients expressed fear of falling. These findings highlight the need for more intensive, individualized, and prolonged rehabilitation strategies addressing both physical and psychological recovery.

POSTER WALK 4: TRAUMA 3

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Pelle Baggesgaard Petersen

Jens Hjermind Højvig

Posters 230–239

230. The Patient Continuity of Care Questionnaire: Translation and Cultural Adaptation to a Danish Context

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Background: Inadequate continuity of care at hospital discharge is associated with readmissions, adverse events, and low patient satisfaction. Assessing patients' perceptions of continuity of care may help healthcare professionals identify gaps and develop interventions. No validated Danish instruments currently measure patient-reported continuity of care around discharge.
Aim: The aim of this study was to translate and culturally adapt the Patient Continuity of Care Questionnaire (PCCQ) for use in Danish orthopaedic settings.
Materials and Methods: The translation process adhered to the ISPOR guidelines and was guided by the COSMIN Study Design Checklist for Patient-Reported Outcome Measurement instruments. This included independent forward translations by two translators, back translation, harmonization, and cognitive debriefing with patients. Following a predefined interview guide, debriefing used the think-aloud method and cognitive interviewing. Ten orthopaedic patients reviewed the before discharge section of the PCCQ and ten patients reviewed the after discharge section. Finally, the translated version was assessed by the research team and the original developer of the PCCQ to ensure conceptual equivalence, cultural relevance, and content validity.
Results: The translation and cultural adaption of the PCCQ into Danish was performed successfully. Several items required minor semantic and contextual revisions to ensure clarity, use of lay language, and relevance to Danish orthopaedic care. This included clarifying wording such as "provider", "informal caregiver", and "non-urgent symptoms". Cognitive debriefing with orthopaedic patients confirmed that the items were understandable, meaningful, and acceptable, thereby enhancing content validity, while pilot testing indicated limited suitability for frail older patients with multimorbidity.
Interpretation / Conclusion: The Danish PCCQ is a content-valid, comprehensible, and relevant tool for orthopaedic patients, capturing patient-perceived continuity of care around hospital discharge. It provides a foundation for future psychometric testing and may support practice by identifying areas for improving discharge planning and patient-centered transitional care in an orthopaedic context.

231. Internal Fixation versus Arthroplasty in Nondisplaced Femoral Neck Fractures in the Elderly: A Systematic Review and Meta-analysis

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Background: Nondisplaced femoral neck fractures (Garden I– II) are common in elderly patients and are traditionally treated with internal fixation (IF). However, increasing evidence suggests that hemiarthroplasty (HA) may offer advantages in selected patients, particularly regarding failure and reoperation.
Aim: This systematic review and meta-analysis aimed to compare clinical outcomes of IF versus HA in elderly patients, integrating high-level evidence from randomized controlled trials (RCTs).
Materials and Methods: A systematic search of EMBASE, MEDLINE, Web of Science, and Cochrane Central was performed from inception to October 2025. Studies comparing IF and arthroplasty in patients ≥60 years with nondisplaced femoral neck fractures were included. Twelve studies (4 RCTs, 7 retrospective, 1 prospective) comprising 11,741 patients were included. A primary meta-analysis was restricted to RCT data. Outcomes included reoperation, mortality, complications, functional scores, and perioperative parameters.
Results: Across all studies, IF was associated with higher failure and reoperation rates, primarily due to fixation failure and avascular necrosis. In the RCT meta-analysis, IF demonstrated a significantly higher risk of early reoperation at 3 months (RR 2.93; 95% CI 1.53–5.61; p=0.001). No significant differences were found in mortality at 1 year (RR 1.31; p=0.268). Functional outcomes were largely comparable between groups, with no significant differences in HHS or VAS at 1–2 years. A small but statistically significant advantage in quality of life (EQ-5D) at 1 year favored HA (MD −0.07; p=0.025). Observatonal data supported these findings, demonstrating consistently higher revision rates after IF, particularly in older and frail patients.
Interpretation / Conclusion: In elderly patients with nondisplaced femoral neck fractures, IF is associated with a significantly higher risk of early reoperation compared with HA, while mortality and most functional outcomes are similar. These findings suggest that HA should be considered more frequently in older or high-risk patients, whereas IF remains a reasonable option in selected physiologically younger individuals.

232. Regional Variations in the Management of Malleolar Fractures: A Comparative Study of Danish Clinical Guidelines

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Background: Despite increasing evidence regarding optimal care, the management of ankle fractures remains notably heterogeneous.
Aim: This study aims to map local guidelines for ankle fracture management.
Materials and Methods: We conducted a national cross-sectional mapping study of local clinical guidelines for ankle fracture management. Guidelines were collected via hospital intranets and through direct contact with orthopedic departments. Guidelines from both emergency and orthopedic departments were included.
Results: We identified 22 hospitals treating malleolar fractures across Denmark. One hospital lacked a written guideline. Across the remaining 21 hospitals we identified 17 different guidelines. The Lauge-Hansen system was the most frequently used classification system (90%). Most departments (95%) had guidelines for radiographic imaging, including: use of weight-bearing X-rays (90%), X-rays of the lower leg (95%), and indications for CT scans (86%). Indications for surgical treatment varied, but most agreed that all bimalleolar and trimalleolar fractures require surgical treatment (81%). For isolated lateral malleolar fractures, the main indications were talar shift (67%) and displacement (71%) but with varying definitions. For isolated medial malleolar fractures, the main indication was displacement (67%) but with varying definitions. For posterior fractures, the primary indications for surgery were displacement 16 (76%) and involvement of the talocrural joint line 11 (52%) - each defined using varying criteria. Post-surgical regimens primarily consisted of a walker (86%) with either progressive (38%) or full weight-bearing (33%), though protocols vary by implant choice, comorbidities, and fracture severity. Non-surgical treatment for lateral malleolus fractures most often included a walker and full weight-bearing (62%). For non-surgical treatment of medial fractures, departments favored a walker (57%) and full weightbearing 9 (43%).
Interpretation / Conclusion: This study highlights significant regional disparities in the management of malleolar fractures, underscoring the need for homogeneous, evidence-based national treatment protocols.

233. Closed-Incision Negative Pressure Wound Therapy Does Not Reduce Surgical Site Infection Rates When Compared to Conventional Wound Dressings in Ankle Fractures Operated via the Lateral or Posterolateral Approach

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Background: Surgical site infection (SSI) is a common complication following ankle fracture surgery, with an incidence of 10–14%. To reduce SSI rates, postoperative closed-incision negative pressure wound therapy (ciNPWT) is discussed as an alternative to conventional wound dressings (CWDs). Although studies suggest that ciNPWT may reduce SSI risk in various surgical indications, evidence remains heterogeneous, and the benefit in ankle fracture surgery is unclear.

Aim: To compare the incidence of SSI in ankle fracture patients treated with open reduction and internal fixation via the lateral or posterolateral approach, followed by application of either ciNPWT or CWD following skin closure.

Materials and Methods: This retrospective cohort study included adults (≥18 years) who underwent ankle fracture surgery via the lateral or posterolateral approach between October 2021 and September 2022 (CWD group) and between January 2024 and December 2024 (ciNPWT group). Data was retrieved through retrospective chart review. The primary outcome was SSI within 6 weeks. SSI risk was calculated with multivariable logistic regression adjusted for body mass index (BMI), American society of anaesthesiologist (ASA) class, current tobacco use, current alcohol consumption and duration of surgery, following confounder evaluation.

Results: A total of 295 patients (median age 58; 65% female) were included, of whom 48% were treated with ciNPWT. SSIs occurred in 15% of patients treated with ciNPWT (12% superficial, 2.8% deep) and in 9.9% treated with CWDs (5.3% superficial, 4.6% deep). Multivariate analysis showed 54% higher odds of SSI with ciNPWT compared to CWD, although not statistically significant (95% CI 0.71–3.38; p = 0.28). Odds of deep SSI were 35% lower in the ciNPWT group, again not statistically significant (95% CI 0.13–2.57; p = 0.55).

Interpretation / Conclusion: We found no association between the use of ciNPWT following ankle fracture surgery and reduced SSI rates compared with CWDs. Although deep infections were less frequent in the ciNPWT group, the overall infection rate was higher. Prospective, randomized studies are warranted to further clarify the potential benefits of ciNPWT in this patient population.

234. Evolution of suprapatellar tibial nailing: a definitive 30-year bibliometric review

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Background: The suprapatellar (SP) approach to tibial intramedullary nailing has evolved substantially over the past three decades, transitioning from a technically innovative alternative to the infrapatellar (IP) method into a globally recognized standard for tibial shaft fracture management.
Aim: This bibliometric study aimed to evaluate global publication trends, research themes, and evidence evolution surrounding SP tibial nailing between 1995 and 2025.
Materials and Methods: A comprehensive bibliometric and evidence-based analysis was performed using the PubMed/MEDLINE and Crossref databases. Studies published from January 1995 to October 2025 were identified using predefined search terms. Eligible articles addressing suprapatellar or semi-extended tibial nailing were screened for design, origin, citation impact, and evidence level.
Results: A total of 128 eligible studies were identified, including clinical trials, cadaveric analyses, and systematic reviews. Global publication output increased exponentially after 2012, coinciding with the introduction of specialized SP instrumentation. The United States, United Kingdom, Germany, China, and Australia collectively contributed over two-thirds of publications. Recent years (2020– 2025) demonstrated a transition from observational studies to high-level evidence, with six randomized controlled trials and six meta-analyses identified. Quantitative trends revealed reduced operative times, improved alignment, and lower rates of anterior knee pain with SP compared to IP nailing.
Interpretation / Conclusion: Bibliometric and evidence synthesis confirms a steady progression in research quality and international collaboration in SP tibial nailing. The accumulated body of evidence supports SP nailing as a safe, efficient, and reproducible technique with distinct advantages over the infrapatellar approach. Continued longitudinal and cost-effectiveness analyses are warranted to consolidate its role in modern orthopaedic trauma practice.

235. Association between Use of Subcutaneous Suture and Surgical Wound Complications after Ankle Fracture Surgery

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Background: Ankle fractures are among the most common fractures and account for a substantial proportion of hospital admissions. The incidence of surgically treated ankle fractures is increasing, emphasizing the importance of reducing postoperative complications. Previous studies have primarily focused on patient-related risk factors such as obesity, age, comorbidities, alcohol consumption, and smoking, but less attention has been given to surgical technique and methods of soft tissue closure.
Aim: This study aimed to investigate the association between the use of subcutaneous sutures and surgical wound complications following operative treatment of ankle fractures.
Materials and Methods: Data from 205 patients undergoing surgical treatment for ankle fractures at a single orthopaedic department were collected over a two-year period. Patient demographics, surgical procedures including implants and soft tissue management, and fracture classification according to the AO system were recorded. Wound outcomes were assessed postoperatively and at outpatient follow-up at 2 and 6 weeks. Multivariable logistic regression analysis was performed adjusting for known risk factors for surgical wound complications.
Results: 205 patients were included in the analysis, 29 developed surgical wound complications within 6 weeks. Most complications occurred without implant exposure. Subcutaneous sutures were used in 139 patients (68%). At 6 weeks, the adjusted odds ratio (OR) for surgical wound complications associated with the use of subcutaneous sutures was 0.40 (95% CI 0.16–1.08; p=0.073). Diabetes was associated with higher odds of wound complications (OR 2.94; 95% CI 0.96– 16.14; p=0.057), although this was not statistically significant. ASA score and age were significantly associated with wound complications. An ASA score ≥3 was associated with lower odds (OR 0.17), while age was associated with a 3% increase in odds per year..
Interpretation / Conclusion: The use of subcutaneous sutures was associated with lower odds of surgical wound complications, although the association was not statistically significant. Larger studies are needed to further clarify the potential effect of subcutaneous sutures on postoperative wound healing after ankle fracture surgery.

236. Clinical Effect Analysis of Sled Plate Internal Fixation in the Treatment of Herscovici Type C Medial Malleolus Fractures

Fushenhan Chen, Chen Jiangtao, Lu Xiuqing

Background: Herscovici type C medial malleolus fracture is a common clinical fracture type. This study aims to analyze the clinical efficacy of sled plate fixation as a novel internal fixation method.
Aim: To investigate the clinical efficacy of sled plate internal fixation for Herscovici type C medial malleolus fractures, and assess its clinical application value.
Materials and Methods: Seventeen patients with Herscovici type C medial malleolus fractures admitted between February 2021 and May 2024 were enrolled. All diagnoses were confirmed by ankle X-ray and 3D CT reconstruction. The study comprised 10 males and 7 females, with a mean age of (42.3±5.7) years. Patients with severe comorbidities, multiple fractures, nerve or vascular injuries, and pathological fractures were excluded. All subjects underwent open reduction and sled plate internal fixation, combined with standardized postoperative rehabilitation. Follow-up was conducted to document fracture healing, ankle function recovery, and complications.
Results: All patients completed 6-12 months of follow-up, with a mean duration of (8.5±2.3) months. All fractures achieved bony union within 8-12 weeks (mean 9.4±1.5 weeks). No severe complications, such as delayed union, nonunion, implant loosening or breakage, wound infection, or traumatic arthritis, were observed. At 6 months post-surgery, the AOFAS ankle-hindfoot score showed an excellent and good rate of 94.12%, with restored ankle mobility and unimpaired daily activities.
Interpretation / Conclusion: Sled plate internal fixation is a reliable treatment for Herscovici type C medial malleolus fractures, with advantages of rigid fixation, high union rate, satisfactory functional recovery, and favorable safety. It is worthy of clinical promotion.

237. Incidence and Predictors of Fracture-Related Infection after Ankle Fracture Surgery: A Retrospective cohort study of 147 patients.

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Background: Ankle fractures frequently require surgical intervention, but fracture-related infection (FRI) remains a severe complication, causing a risk for poor functional outcome, pain, and a risk for amputation. Treatment of FRI includes revision surgery, days in hospital, and systemic antibiotics. Identifying patients at high risk is crucial for optimizing perioperative care.
Aim: To determine the prevalence of FRI and investigate prognostic risk factors for FRI following surgical treatment of ankle fractures.
Materials and Methods: A retrospective chart review was conducted at a level II trauma center from January 2024 to January 2025, including adult patients surgically treated for ankle fractures. FRI cases were identified from electronic medical records and defined by confirmatory or suggestive criteria, with positive bone or tissue samples at reoperation. Baseline demographics, fracture characteristics, and surgical variables were analyzed using univariable statistics.
Results: The cohort comprised 147 operated patients (69% female, mean age 59 years). The predominant type of fracture (79%) was Supination-External Rotation (SE) according to the Lauge-Hansen classification. The overall FRI prevalence was 10.9% (n = 16). Of this group, 15 (94%) presented with confirmatory signs, and 1 (6%) presented with suggestive signs. Deep tissue sampling was performed in 15 of the 16 FRI cases (94%), yielding 9 positive cultures (60% of sampled cases). Within the subgroup presenting exclusively with suggestive signs, 1 (9%) was culture-positive. Prognostic variables did not individually predict FRI significantly: diabetes (19% vs. 6.9%, p = 0.126), smoking (31% vs. 29%, p = 1.000), and mean BMI (27.8 vs. 28.6, p = 0.817) were similar between the FRI and non-FRI groups. Patients developing FRI tended to be older (mean 63 vs. 59 years, p = 0.370), and nearly 69% of FRI cases were treated with a fibula rod (p = 0.073).
Interpretation / Conclusion: The FRI rate after ankle fracture surgery was 10.9%. No associations were found with traditional lifestyle risk factors. Instead, higher age and frequent use of fibular nails suggest a more fragile patient group at risk. Further studies are needed to explore this topic.

238. Investigating the clinical value in relation to implementation and use of an AI-generated fracture algorithm tool to support clinical decision making

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Background: The use of artificial intelligence (AI) in imaging departments is increasing in Europe. This study assesses the clinical value of an AI fracture algorithm by assessing ease of use, clinicians' trust, and perceived barriers and benefits of this decision support tool in daily practice across two Emergency Departments (EDs) in Denmark.

Aim: To evaluate the clinical value of an AI fracture algorithm by assessing clinicians' satisfaction with usability, trust in AI-generated diagnoses, perceived barriers and benefits in daily practice, and its impact on treatment changes.

Materials and Methods: An online survey was distributed to healthcare professionals interpreting radiographs in the ED at Lillebaelt Hospital. The Danish-language survey included questions addressing AI use. Additionally, an observational study was conducted, including workflow observations and time tracking of patient progression through the ED. Historical orthopedic and radiological team meeting records from February 2023 to 2025 were reviewed to assess changes in patient management before and after AI implementation.

Results: A total of 56 responses were obtained. Most respondents reported a positive attitude toward the algorithm. Ease of use was rated satisfactory by 51 out of 56 participants, and 48 were satisfied with AI as a clinical decision support tool. Overall trust was high, with more than two thirds (n=38) 'agreeing' or 'strongly agreeing' that the algorithm reliably detects fractures. However, an asymmetry in clinical trust was observed: whereby clinicians expressed greater confidence in their own assessments when the algorithm indicated the presence of a fracture than when it did not. Value stream analyses showed a delay of 6–23 minutes between radiograph acquisition and availability of the AI report. No differences were observed in the number of patients with treatment changes before, during, or after full implementation of the algorithm.

Interpretation / Conclusion: The AI fracture-detection tool was overall well received by clinicians, although some observations indicate that implementation and workflow integration still require improvement. Larger studies are needed to validate the reported barriers and benefits of the AI fracture detection tool.

239. Healthcare Personnel's Perspectives on an Enhanced, Standardized Interdisciplinary Cooperation Program in Nursing Homes Following Hip Fracture: An Ethnographic Interview study

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Background: A politically mandated enhanced standardized interdisciplinary coordination (ESIC) model was introduced to improve collaboration between hospitals and nursing homes (NH) for hip fracture patients. It involved structured post-discharge care in nursing homes and 2-week extended hospital care, requiring new collaborative practices whose success depended on how NH staff perceive and enact the intervention.
Aim: This study explored the healthcare personnel's (HCP) perspectives on the ESIC and observed how the intervention functioned in practice at the NHs.
Materials and Methods: An ethnographically inspired design was applied, combining field observations and semi-structured interviews with HCP in NHs. Observations were guided by Spradley's nine-domain framework. During field observations, semi-structured interviews were conducted with HCP using an interview guide until saturation was reached. Interview data were analyzed using Braun and Clarke's thematic analysis within a hermeneutic framework. Observational and interview findings were compared to assess alignment.
Results: Twelve interviews (8-33 minutes) and 180 hours of observations across 10 NHs were conducted. Participants were NH nurses (n=7), outreach nurses (n=3) and NH social and health care assistants (n=2). Four overarching themes revealed dualistic findings. The systematic use of Early Warning Score was integrated into daily routines (Theme 1, Normalization of the intervention in everyday practice) and supported a broader clinical view of residents (Theme 2, Clinical awareness, ethics and relational care). However, tensions emerged as some nurses experienced a shift from direct care towards documentation (Theme 3, Role restructuring and coordination work) and mobilization was often omitted as residents were assessed as too vulnerable. Also, incomplete discharges and project tasks not carried out, were a source of frustration (Theme 4, Systemic constraints and safety vulnerabilities).
Interpretation / Conclusion: The study demonstrates that an ESIC can be integrated into NHs routines and enhance clinical awareness. However, professional roles and prioritization of mobilization need clearer alignment between clinical goals and practice.

POSTER WALK 5: TRAUMA 4

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Michaela Manalili Hansen

Bjarke Viberg

Posters 240–249, 387

240. Is side of ankle fracture associated to probability of returning to work?

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Background: Ankle fractures are common injuries, with a substantial proportion treated surgically. Complications and patient-related factors are known to influence recovery, but the impact of fracture side on functional outcome remains unclear.
Aim: This study aimed to investigate whether fracture side is associated with return to work 6 weeks after injury.
Materials and Methods: This retrospective cohort study included adult patients with ankle fractures treated at Lillebælt Hospital between 2022 and 2025. Data were obtained from the KOKO MALL database. Patients attended standardized follow-up at 2 and 6 weeks. Fractures were classified according to the AO system, and treatment (surgical vs. conservative) was recorded. The primary outcome was return to work at 6 weeks (full-time, part-time, or not working). Logistic regression analyses were performed to estimate odds ratios (ORs) for return to work according to fracture side (left vs. right), adjusted for age, sex, BMI, fracture type, and treatment.
Results: A total of 173 patients were included; 60% were male and fracture side was equally distribyuted with 51% being right-sided. Patients with left-sided fractures had lower odds of returning to full-time work at 6 weeks compared to right-sided fractures (adjusted OR 0.52, 95% CI 0.22–1.23). For part-time return to work, the adjusted OR was 1.09 (95% CI 0.46–2.60). When combining full- and part-time return to work, left-sided fractures were associated with lower odds of return to work (adjusted OR 0.73, 95% CI 0.37–1.43).
Interpretation / Conclusion: Left-sided ankle fractures appeared associated to lower odds of return to work after 6 weeks compared to right-sided fractures, although findings were not statistically significant. Larger studies including occupational data are needed to clarify whether fracture side independently influences early functional recovery.

241. Hemoglobin dynamics according to gender in patients with hip fractures.

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Background: Perioperative hemoglobin (Hb) decline is a known risk factor in hip fracture surgery. Gender-related differences in Hb dynamics may influence recovery and mortality. This study examined perioperative Hb trends in men and women to identify potential differences in vulnerability.
Aim: To assess whether men and women show different perioperative Hb patterns and whether these differences relate to the disparity in postoperative outcomes.
Materials and Methods: Pre and postoperative Hb values were collected from 53 hip fracture patients treated between January and March 2025. Patients were stratified by sex and surgical technique (intramedullary nailing vs. other osteosynthesis). The cohort included 35 women (mean age 84.7 years) and 18 men (mean age 81.8 years). Admission Hb and the first postoperative Hb measurement were compared within and between groups. Additional analyses assessed whether surgical technique influenced perioperative Hb trends. All analyses were descriptive.
Results: No significant differences in Hb levels at admission or discharge were observed between men and women or between surgical techniques. Despite men normally having Hb values about 1 mmol/L higher than women, both sexes presented with similar perioperative levels. One year mortality was 30% among women and 47% among men, indicating substantially higher mortality in men despite comparable Hb values.
Interpretation / Conclusion: Men and women showed similar perioperative Hb levels and Hb decline, regardless of surgical technique. However, men experienced markedly higher one year mortality, suggesting increased vulnerability not explained by perioperative Hb changes alone. These findings highlight the need for heightened clinical attention to male hip fracture patients.

242. Isolated displaced epiphyseal fracture of the distal fibula: A case report and literature review

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Background: The isolated epiphyseal Salter-Harris type I (SH-I) fracture of the distal fibula in adolescents is a rare condition. To our knowledge, only 3 cases have been reported. The isolated fibula SH-I fracture is exclusively seen in adolescents with a fused tibial epiphysis and an unfused fibular epiphysis, creating a potentially weak spot that may be vulnerable to trauma.
Aim: To describe the mechanism of trauma, fracture type, treatment, and follow-up. Also to share knowledge with fellow surgeons concerning recommendation on ORIF of this particular injury based on X-ray and trauma-mechanism.
Materials and Methods: We report a case of a 15-year-old adolescent who was admitted to the Emergency Room at our hospital in April 2026 with a dislocated right ankle following rotational trauma. Closed reduction was performed twice and acceptable, but not anatomical, position was achieved. A focused literature search was conducted to identify similar case reports. In dislocated SH1 fractures, a medial clear space is often found, this indicates that the medial ligaments are partially or completely ruptured, leading to instability. Open reduction and internal fixation (ORIF) is necessary to achieve anatomical position and sufficient stability. As the fracture was dislocated with medial clear space, ORIF was chosen.
Results: Surgery was performed one day after the date of trauma. During surgery, a tear of periosteal tissue was removed from the fracture site, enabling anatomical reduction. The syndesmosis was assessed intraoperatively with external rotation test and found stable. The patient was allowed weightbearing as tolerated immediately after surgery. Further follow-ups up to 1 year are planned.
Interpretation / Conclusion: This case shows a rare injury pattern in adolescents. As the fracture is highly unstable and often difficult to reduce closed, we recommend ORIF for the displaced isolated SH-I fracture of the distal fibula to provide a stable ankle joint and thereby a swifter return to activities of daily living. This case has prompted consideration of a prospective registry of rare adolescent ankle injuries, given that our hospital manages a high volume of pediatric orthopedic trauma cases.

243. Routine radiographic follow-up rarely leads to change in treatment of non-operatively treated proximal humerus fractures.

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Background: Proximal humeral fractures (PHF) are common and mainly treated non-operatively including routine radiographic follow-up (RF). Although secondary displacement may occur, it is our impression from clinical practice that treatment rarely is changed to surgery
Aim: We aimed to explores the hypothesis that conversion to surgery is rare and may be more common for some fracture subtypes (Neer). In addition, we calculated travel distance and CO_2 emissions if RF is not done routinely
Materials and Methods: We included a retrospective cohort of all adult patients treated in the Northern Denmark Region (2018–2022). Diagnoses (ICD-10 DS42.2) were made at five hospitals; RF and surgery were centralized to two hospitals. Patients operated on within 7 days were considered primarily operated and excluded. Only surgery within 3 weeks after RF was considered a consequence of a decision made at RF. The primary outcome was conversion to surgery argued by secondary displacement. Fractures were classified by 2 observers. Secondary outcomes were travel distance and estimated CO_2 emissions versus a decentralized model. Descriptive statistics and Mann–Whitney U tests ($\alpha=0.05$) were used
Results: 2,553 unique patients with PHF were identified. Of these, 338 underwent primary surgery, leaving 2,215 for conservative treatment. Conversion to surgery occurred in 61 cases (2.8%). In 45 patients (2.0%), conversion was argued by secondary displacement, while in 16, unacceptable alignment was already present on initial radiographs. By the Neer classification, 9 fractures were minimally displaced, 25 two-part, 8 three-part, and 3 four-part. 7 of 15 greater tubercle fractures were associated with anterior shoulder dislocation. Total travel distance for follow-up was 139,770 km versus 27,970 km in a decentralized model ($p<0.0001$), with corresponding differences in CO_2 emissions
Interpretation / Conclusion: Routine RF of non-operatively treated PHF rarely changes management and may be restricted to minimally displaced or two-part fractures involving the surgical neck and/or greater tubercle as these were most dominant. These findings and a new regimen derived therefrom need be tested in a prospective setting

244. Mandatory templating failed to decrease the dislocation rate after hemiarthroplasty for femoral neck fractures

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Background: Complication rates—particularly dislocation— remain substantial in displaced femoral neck fractures (FNF) treated with hemiarthroplasty (HA). Preoperative templating is well established in total hip arthroplasty (THA), but its effectiveness in hemiarthroplasty for FNF is unclear due to limited evidence.
Aim: To evaluate whether preoperative templating for FNF patients treated with HA reduces the risk of dislocation.
Materials and Methods: Data was retrieved from the Electronic Patient Journal (EPJ) 9 years prior to and 4 years after the introduction of templating in January 2021 at Aarhus University Hospital (AUH). All patients' health records were retrospectively reviewed for implant type and size, dislocations, and other complications. All templated X-rays were analyzed for radiological measurements concerning head-neck- and stem-size, and quality of X-ray. Dislocations were defined by registration in the electronic patient journal and cross-checked with the X-ray.
Results: Among 1,297 hips (876 non-templated; 421 templated; mean age 82.4 years), dislocation occurred in 6% of cases. Dislocation rates were 6% without templating and 7% with templating, with no significant difference (HR: 0.85; p= 0.49). Mortality did not differ between groups after adjusting for follow-up time. Among templated cases, 85% of stems were within ± 1 size of the template and 80% of heads within ± 2 mm; exact matches occurred in 13%.
Interpretation / Conclusion: We found no statistically significant difference when comparing templating versus non-templating in patients treated with HA. Despite suboptimal radiographic quality, the discrepancy between templated and implanted prosthetic was not attributable to imagining limitations.

245. Rate and risk factors for dislocation after hip hemiarthroplasty for acute femoral neck fractures; a scoping review

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Background: Dislocation of hip hemiarthroplasties (HA) is a common complication. However, the existing knowledge regarding dislocation rates and risk factors is based on literature that is characterized by substantial differences in study designs. This makes interpretation difficult and increases the risk of treatment decisions being made on the uncertain basis.
Aim: We aimed to provide a comprehensive overview of studies reporting on dislocation of HAs in patients following femoral neck fracture, with an emphasis on rates, risk factors, and patient-reported outcomes.
Materials and Methods: This scoping review was conducted in accordance with the methodology of the Joanna Briggs Institute for scoping reviews. We developed a search strategy for Embase, MEDLINE, PubMed, and the Cochrane Library. Papers describing dislocation rates, risk factors, or patient-reported outcomes were included. All identified citations were assessed by two independent reviewers. The following quality assessment elements were considered: single- or multi-centre studies, follow-up, and changes over time, with a minimum of five studies involving at least 10 dislocations.
Results: There were 178 papers meeting the inclusion criteria. The reported dislocation rate ranged from 0 to 16.6%. Single- and multi-centre studies had a median dislocation rate of 2.3%. Follow-up studies of ≤ 6 months had a median dislocation rate of 2.3%. Publications after 2020 showed a median dislocation rate of 2.0% compared to 6.3% in publications before 1990. Forty-eight studies identified the following risk factors: cognitive impairment, smaller centre-edge angle, smaller or larger offset or acetabulum, and posterior approach. Patient-reported outcomes after a HA dislocation were not reported in any study.
Interpretation / Conclusion: The dislocation rate among patients with HA following femoral neck fractures varied considerably in the literature. This review suggests that the posterior approach should be avoided to prevent dislocation in patients, particularly those with cognitive impairment, and to consider the patient's acetabular size. There is a lack of research on patient-reported outcomes after HA dislocation, which warrants further investigation.

246. Functional Assessment-Guided Treatment in Elderly Patients with Distal Radius Fractures: Impact on Surgical Rates

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Background: Randomized studies suggest that nonsurgical treatment provides equivalent outcomes in low demand elderly patients, but this may not apply to those with higher functional demands to maintain patients' independence. Age alone as a proxy for function could result in either under- or overtreatment. As new guidelines emphasize functional level rather than chronological age, a practical assessment tool is needed to support treatment decisions in maintaining the patients' level of function prior to their injury.
Aim: To examine whether use of a functional assessment tool affects the rate of surgical treatment in elderly with DRFs.
Materials and Methods: This retrospective study included patients ≥65 years treated with volar locking plates for DRFs in 2018 at Herlev and Gentofte Hospital. Surgical indications followed the 2014 Danish National Clinical Guideline: dorsal angulation >10°, >2 mm shortening, or >2 mm intra-articular step off. In 2024, before introducing a new regional DRF treatment guideline the cohort was reassessed. The new guideline bases surgical indication on level of function using the Clinical Frailty Scale (CFS): high (CFS 1–3), moderate (CFS 4–5), low (CFS 6–9). CFS scores were retrospectively assigned from medical records, and radiographs were reevaluated. Patients with alternative fixation, missing imaging, or miscoding were excluded.
Results: 117 of 131 patients (89.3%) still had indication for surgery. Whereas 14 patients (11%) had a CFS score ranging from a moderate to a low level of function and an acceptable displacement for their level of function with no indication for surgical treatment. Mean age was 74.7 years; 88% were female. 51.1% of the fractures were extra articular. CFS distribution was: 72% high functional demand, 24% moderate, and 4% low.
Interpretation / Conclusion: Using the CFS as a decision aid, as proposed in the new guideline, may reduce surgical treatment for elderly DRF patients. Although the retrospective design introduces potential bias, the findings suggest that incorporating functional status may better align treatment with patient needs. A simple functional assessment tools may help ensure more patient centered care and reducing costs in the health care system, hence choosing wisely.

247. A cost-effective and standardized method to induce distal radius fractures in full-length forearm human cadaveric specimens

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Background: Reported rates of secondary fracture displacement in conservatively treated distal radius fractures (DRF) range from 17 to 59%. Thus, realistic biomechanical models are warranted to evaluate novel immobilization strategies that prevent secondary fracture dislocation in conservative fracture management. Currently available human cadaveric specimen models have several limitations: (i) disrupted soft tissue integrity, (ii) difficulty to replicate complex fracture patterns, and (iii) high technical demand and costs.
Aim: Therefore, the aim of this study was to establish an accessible method for inducing DRFs, that accurately reflects in-vivo biomechanical fracture conditions, in tissue-intact cadaveric specimens, suitable for biomechanical testing of novel immobilization devices.
Materials and Methods: Fifteen upper extremity cadaveric specimens were included. Specimens were prepared as full-length forearm models. Using a repurposed strength training tower as a vertical drop tower, fractures were induced by proximally administering 120-135 J impacts. CT scans were performed pre- and post-fracture induction. All fractures were classified according to the AO/OTA classification.
Results: DRFs were successfully induced in all 15 specimens. A single 120 J impact produced a DRF in 11 out of 15 cases (73%). A second impact was administered in 4 specimens. 13 of the 15 induced DRFs (86%) were classified as AO/OTA type C fractures, most commonly 2R3C3.2. A concomitant distal ulnar fracture was present in 5 cases, a concomitant carpal fracture in 9 cases. The overall cost of the setup amounted to 947 €.
Interpretation / Conclusion: We present a reproducible, cost-effective method to induce DRFs in tissue-intact, full-length human cadaveric forearm specimens. The setup produces a clinically relevant fracture spectrum, predominantly AO/OTA type C DRFs with concomitant distal ulna fractures and some associated carpal injuries, which can be utilized for biomechanical testing of immobilization strategies.

248. Development of a retrograde femoral nail with neck screw for trochanteric hip fractures in obese patients

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Background: Trochanteric femoral fractures lead unfortunately often to severe complications, with less than half regaining their pre-injury mobility. In the more than 2% of patients classified as morbidly obese (BMI > 40) excessive adipose tissue complicates surgical access, challenges use of antegrade intramedullary nailing, thus necessitating larger incisions. This leads to significantly poor prognoses, including high risks of deep wound infections and almost doubled 30-day mortality rate compared to patients with a normal BMI. The less fat-tissue surrounding the knee might merit a new not previously available operation method based on a modern retrograde intramedullary nail combined with a collum-caput sliding screw inserted through stab-incisions.
Aim: We propose the first in-vitro prototype of such a novel osteosynthesis method for trochanteric femoral fractures using a retrograde intramedullary hip nail (RIMHN) inserted through the knee, as opposed to a conventional antegrade intramedullary hip nail (AIMHN) inserted through trochanter major.
Materials and Methods: A T2 Alpha Femur Retrograde nail (Stryker) was modified (ELOS MEDTECH) to include 2 Recon screws for the neck of femur. Reduction of perioperative exposure and overall improvement of patient prognosis was investigated by developing and testing a RIMHN prototype. Finite element analysis (FEA) and biomechanical compression-and load-until-failure tests were conducted to evaluate the compressive yield strengths.
Results: The load at yield point was 4000 N for AIMHN and 5000 N for RIMHN indicating comparable strengths, although the results were impacted by sliding of the neck screws during load-until-failure tests. FEA predicted loads at yield point (3700 N for AIMHN and 2900 N for RIMHN) more accurately than displacement at yield point, which proved to be 4 and 10 times larger in the load-until-failure tests, respectively. Testing in a plastic femoral bone proved the operational feasibility of RIMHN successful.
Interpretation / Conclusion: This novel osteosynthesis method using RIMHN could theoretically improve the prognosis in morbidly obese patients by severely reducing the operative time and length of incision, thus lowering the risk of complications.

249. Patient Blood Management in Older Adults undergoing Hip Fracture Surgery: Survey of Clinical Practice across Scandinavia

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Background: Patients with a hip fracture are frequently given red blood cell transfusions, although there is uncertainty regarding the optimal transfusion trigger. Most guidelines recommend transfusion below a restrictive haemoglobin threshold of 7-8 g/dL (4.3-5.0 mmol/L). No trials have assessed triggers based on measures other than haemoglobin, although the level of haemoglobin may not be the best measure of oxygen transportation capacity.

Aim: The aim of this Scandinavian survey was to investigate red blood cell transfusion triggers and other blood management regimes for patients undergoing HF surgery.

Materials and Methods: We conducted a cross-sectional nationwide survey of patient blood management practices in hospitals performing hip fracture surgery in Denmark, Sweden, and Norway. Eligible hospitals were identified through national hip fracture registries. A customized questionnaire, was distributed via REDCap to a contact person involved in hip fracture care at each hospital. The survey will capture institutional practices regarding local transfusion triggers, at which time points haemoglobin is measured, management of anticoagulants, use of tranexamic acid, and iron or erythropoietic treatments across the perioperative period. The analyses will be descriptive and reported as counts and percentages overall and by country, both at hospital level and weighted by the annual number of hip fracture patients treated at each hospital.

Results: Results from the survey will be presented at the congress

Interpretation / Conclusion: Identifying similarities and differences between hospitals and countries may highlight areas of consensus and variation in care. Mapping current practice may also identify potential gaps between hospitals and countries and inform future research on optimal transfusion strategies in hip fracture patients. Protocol registration: doi.org/10.5281/zenodo.19700224

387. An Acta Educational Article: Choosing Treatment with an Elderly Patient Having a Distal Radius Fracture

Marcus Landgren[1,2], Cecilia Mellstrand Navarro[3], Teemu Karjalainen[4], Rikke Thorninger[5], Sondre Hassellund[6,7], Rasmus Wejnold Troest[8], Jeppe Vejlgaard Rasmussen[1,2], Hebe Désirée Kvernmo[9], Dennis Winge Hallager[2,10], Tamara Rozental[11], Magnus Tägil[12,13]

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Background: Approximately 50% of distal radius fractures (DRFs) occur in individuals aged >65 years, and 20% >80 years. Guidelines often use chronological age as a proxy for low functional demands, strongly influencing the choice of non-surgical treatment. However, many elderly individuals remain active, and a DRF may be their only limiting factor, making treatment strategies used in younger adults more appropriate. Patient-reported outcome measures (PROMs) assess the treatment outcome but are incomplete assessment due to ceiling effects. In addition, variability in populations, fracture patterns, and treatments could limit the external validity.

Aim: To support physicians in shared decision-making in elderly patients with DRFs by summarizing current evidence on treatment, complications, outcomes, health economics, and osteoporosis screening, and proposing a functional demand–based treatment algorithm.

Materials and Methods: An updated literature search of Medline, Embase, and CENTRAL was performed, building on a previous systematic review and meta-analysis. Randomized controlled trials comparing volar locking plate (VLP) fixation with non-surgical treatment were identified, including five additional RCTs. National clinical guidelines and observational studies addressing complications, osteoporosis screening, and health-economic aspects were reviewed. Final search date October 1, 2025.

Results: Assessing stability is essential in treatment of DRF and stability is influenced by displacement, comminution, intra-articular involvement, and associated ulnar fractures. Reduced DRFs are treated non-surgically, although up to 50% may displace and surgical treatment could be valid. Radiographic alignment shows modest correlation with function, and malalignment is often tolerated in elderly individuals. Surgery provides faster recovery and improves radiographic outcomes but limited long-term functional benefit, with comparable complication rates.

Interpretation / Conclusion: Treatment should be individualized through shared decision-making, prioritizing functional demands over chronological age. Non-surgical treatment is appropriate for most elderly patients, while surgery may benefit selected individuals with moderate to high functional demands.

POSTER WALK 6: SPORTS ORTHOPAEDICS / ARTHROSCOPY 1

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Louise Eggers Rasmussen

Niels-Christian Kaldau

Posters 250–259

250. Return to sport in pivoting and non-pivoting sports in patients treated with either surgical reconstruction or training with the option of delayed surgical reconstruction. A systematic review of randomized controlled trials.

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Background: Reconstruction of the anterior cruciate ligament (ACLR) is commonly recommended for patients returning to pivoting sports. Non-operative treatment, with the option of delayed ACLR, is often advised for those returning to non-pivoting sports. Recent studies have reported high return to sport rates with non-surgical treatment. The literature remains inconsistent, and it is unclear whether patients aiming to return to pivoting sports derive greater benefit from primary ACLR than those returning to non-pivoting sports.
Aim: To investigate the proportion of patients returning to pivoting and non-pivoting sports after a complete rupture of the ACL in patients treated with either primary ACLR or training with optional delayed ACLR.
Materials and Methods: This study was a systematic review following the PRISMA guidelines. The literature search was performed in November 2025 in MEDLINE (PubMed), Embase (Ovid), Scopus, Cochrane CENTRAL, CINAHL, and PEDro. Only RCT's with a population between the ages 16-40 with a complete ACL rupture were included. The primary outcome of the study was to assess the proportion of patients returning to sports. Risk of bias was assessed using the Cochrane ROB2 tool.
Results: 4 randomized controlled trials (1 with some risk of bias, 3 with low risk of bias) were included. None of the studies reported data relating to return to sports divided in patients wishing to return to pivoting sports and non-pivoting sports. The primary ACLR group had significantly higher pre-injury Tegner scores, and more successful return to pre-injury level of sport compared to the training group with optional delayed ACLR.
Interpretation / Conclusion: No randomized controlled trials (RCTs) were identified assessing return-to-sport outcomes in pivoting versus non-pivoting sports following anterior cruciate ligament (ACL) rupture after surgical reconstruction or non-operative management with the option of delayed reconstruction. The primary ACLR group demonstrated significantly higher Tegner scores and a higher proportion of patients returning to their pre-injury level of sport compared with the training group with the option of delayed ACLR.

251. Outcomes after revision medial patellofemoral ligament reconstruction in a multicentre cohort

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Background: Limited knowledge exists concerning outcome after revision medial patellofemoral ligament reconstruction (MPFL-R) in comparison with primary MPFL-R.
Aim: The purpose of this study is to evaluate the radiological characteristic and clinical and subjective outcomes after revision MPFL-R compared with primary MPFL-R without revision in large regional cohort in Denmark
Materials and Methods: A cohort from the central region of Denmark included 1,564 patella stabilizing surgical procedures from 2010 to 2024. 887 patients with 1,018 procedures accepted study inclusion and responded to subjective outcomes and patella instability status. There were 960 primary MPFL-R and 58 revision MPFLR procedures. Supplemental tibial tuberosity osteotomy (TTO) was performed in 56% and 25% of revision MPFL-R and MPFL-R cases respectively. The mean age was 19.0 and 22.7 years in revision MPFL-R and MPFL-R groups. Average follow-up 7.2 years. Prior to surgery, dysplasia of the patellofemoral joint, Lateral Trochlea index, sulcus angle, Insall-Salvati index, cartilage lesions, tibial tuberosity trochlear groove (TTTG) distance were evaluated by magnetic resonance imaging (MRI). Subjective outcome was evaluated by the Kujala Score and the Banff Patella Instability instrument 2.0 (BPII 2.0) at final follow-up along with questions regarding redislocation and subluxation episodes.
Results: There were no differences in radiographic patellafemoral dysplasia characteristics between revision MPFL-R cases and primary MPFL-R cases. Severe trochlear dysplasia Dejour Type C+D was seen in 26% of revision MPFLR cases compared to 22% in primary MPFL-R cases. The mean Kujala score at final follow-up was 60 in the revision MPFL-R group compared to 79 in the MPFL-R group ($P<0.001$). BPII 2.0 score was 37 and 59 for the revision MPFL-R and MPFL-R groups, respectively ($P<0.001$). Revision MPFL-R patients experienced higher incidence of patella redislocation of 23% compared 9% in primary MPFLR patients.
Interpretation / Conclusion: No differences in patellofemoral dysplasi were found between primary MPFL-R cases and revision MPFL-R cases. Both subjective knee function and patella stability outcomes are poorer after Revision MPFL-R than after primary MPFL-R.

252. Postoperative outcome assessment after MPFL reconstruction in sports-active patients: A systematic review and meta-analysis

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Background: Recurrent patellar instability in young, sports-active individuals is commonly treated with medial patellofemoral ligament (MPFL) reconstruction. However, postoperative evaluation varies considerably, particularly regarding return to sport (RTS) and the use of objective and patient-reported outcome measures (PROM).
Aim: To evaluate postoperative assessment practices, synthesise return-to-sport and PROMs, and identify gaps in current evaluation following MPFL reconstruction
Materials and Methods: A systematic review and meta-analysis was conducted in accordance with PRISMA 2020 and prospectively registered in PROSPERO. Seven databases were searched and eligible studies included sports-active adolescents and young adults (15–30 years) undergoing primary MPFL reconstruction for recurrent lateral patellar instability. Studies including tibial tubercle osteotomy or trochleoplasty were excluded. Primary outcomes were RTS and PROMs; secondary outcomes included strength, functional performance, psychological readiness, patellar stability and complications. Random-effects meta-analyses were performed when ≥3 studies reported comparable outcomes. Risk of bias was assessed with the ROBINS-I tool and certainty of evidence with GRADE.
Results: Six observational cohort studies with 235 sports-active patients were included. Follow-up ranged from 8 to 116 months (mean 50). The pooled RTS rate at any level was 91% (95% CI 88–95%; I^2=0%; 5 studies, N=212), whereas the pooled rate of return to pre-injury sport level was 65% (95% CI 56–73%; I^2=38%; 6 studies, N=229). The pooled mean time to RTS was 7.8 months (95% CI 6.2–9.4; I^2=97.7%; 4 studies, N=186). The pooled Kujala score was 92.8 (95% CI 91.8–93.7; I^2=0%; 5 studies, N=143), and Tegner score was 5.7 (95% CI 4.9–6.4; I^2=89.2%; 5 studies, N=177). All pooled outcomes were graded as very low certainty.
Interpretation / Conclusion: Most sports-active patients return to sport after MPFL reconstruction, but fewer than two-thirds return to their pre-injury level despite high PROM scores. Postoperative evaluation is predominantly based on subjective measures, with minimal use of objective or psychological assessment. More standardised evaluation is needed.

253. Physiotherapist-led education and exercise for patients with MRI-verified hip abductor tendon pathology: A prospective cohort study of 60 patients

Mathias Høgsholt[1,2], Signe Kierkegaard-Brøchner[1,2], Jeppe Lange[1,2], Bent Lund[1], Stian Langgård Jørgensen[3,4], Kristian Thorborg[5], Marie Bagger Bohn[1,2]

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Background: Lateral hip pain due to hip abductor tendon pathology (tendinopathy or tendon ruptures of gluteus medius and/or minimus at the greater trochanter) is a prevalent and often debilitating condition that significantly impacts patient mobility and quality of life. Exercise therapy combined with patient education is generally recommended as first-line treatment, with no available evidence on outcome in a nordic context.
Aim: The aim of this study was to investigate changes in lateral hip pain in patients enrolled in a three-month physiotherapist-led education and exercise program (Horsens-LHP program).
Materials and Methods: The study was conducted as a prospective cohort study. Patiens with MRI-verified hip abductor tendon pathology seen at our outpatient clinic, aged 18 or above were eligible. Included patients received seven physiotherapist-led education and exercise sessions, and daily home-exercises for three months. The primary outcome was change in the subscale pain of the revised Copenhagen Hip and Groin Outcome Score (HAGOS) at 3-months follow-up. Secondary outcomes included the Victorian Institute of Sport Assessment - Gluteal questionnaire (VISA-G), isometric hip muscle strength, and a 30 second Chair-Stand-Test (30s-CST).
Results: 60 women with a mean (SD) age of 58.2 (10.9) years were included. Mean (SD) BMI was 29.2 (5.2) kg/m2. At 3-months follow-up, the mean (SD) HAGOS pain score improved from 46.4 (18.6) to 60.1 (21) reflecting a mean [95%CI] change of 14.5 [9.0;20.0], with 64% of patients achieving a clinically relevant improvement. Similarly, the VISA-G score increased from 46.4 (17.6) to 55.7 (15.9) corresponding to a mean [95%CI] change of 9.3 [5.5;13.1]. Minor strength improvements were observed, while the mean (SD) 30s-CST improved from 11.7 (4.4) to 14.2 (5.1) repetitions. No intervention-related adverse events were recorded.
Interpretation / Conclusion: Clinically relevant improvements in lateral hip pain in patients with MRI verified hip abductor tendon pathology was seen after three months of physiotherapist-led combined patient education and exercise therapy.

254. Non-anatomical MPFL-reconstruction and lack to address relevant pathologies are common reasons for Treatment Injuries following treatment for Patellofemoral Instability

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Background: Treating patellofemoral instability (PFI) often require surgical procedures tailored to the patient's individual anatomy. These surgeries can be complex with potential pitfalls.
Aim: The aim of this nationwide study was to analyze problems related to PFI treatment in Denmark, based on claims submitted to the Danish Patient Compensation Association (DPCA). The results can be used to optimize the future treatment of PFI.
Materials and Methods: Compensation claims from 2004-2024 related to treatment of PFI were identified through the diagnostic codes DM220 and DM221. The medical records and imaging were reviewed independently by two observers. Radiographs and MRIs were systematically analyzed to establish anatomical risk factors in each case: trochlear dysplasia (Dejour classification, lateral trochlea inclination angle), patella alta (Caton-Deschamps index, patellar-trochlear index), and lateralized tibial tubercle (tibial tuberosity – trochlear groove). Optimal management was defined according to the á-la-carte principle. Information about compensation was registered for each case.
Results: There were 405 eligible claims. "Treatment injury" can be caused by malpractice (treatment did not follow good standards) or an accidental, rare and serious complication (e.g., a deep infection). The most frequent cause of treatment injury was surgical malpractice (38%), particularly incorrect femoral graft placement during MPFL reconstruction, which accounted for nearly half of the cases of surgical malpractice. Failure to adequately assess or treat anatomical risk factors was the second most common cause (20%), often resulting in repeated surgeries. Nerve injuries (13%) and delayed treatment (8%) were also significant, while deep vein thrombosis (3%) and deep infection were rare (3%). There were 210 claims (54%) being approved for compensation, with a total payout exceeding 34 million DKK.
Interpretation / Conclusion: Many injuries were preventable and linked to non-anatomical femoral graft placement and failure to address all relevant anatomical risk factors. Based on this, we recommend focused surgical accuracy, standardized imaging protocols and treatment algorithms to reduce treatment injuries related to patellofemoral instability.

255. Development of an Item Bank for Patellofemoral Instability

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Background: Patellofemoral instability (PFI) is a common problem and there is a need for a valid Patient-reported outcome measures (PROM) for the condition. An initial step in the development of a valid PROM is the construction of an item bank, which serves as a foundation for subsequent concept elicitation through patient interviews, ultimately ensuring adequate content validity of future PROMs.
Aim: The objective of this study was to identify PROMs that have been used in PFI studies, extract their items, and classify them according to the domains of the International Classification of Functioning, Disability and Health (ICF) model to establish an item bank.
Materials and Methods: A comprehensive literature search was conducted in MEDLINE (via PubMed), EMBASE (Ovid), CINAHL, and PEDro, identifying studies that have used PROM-outcomes to evaluate patients with PFI. The items from these PROMs were retrieved from original publications or supplementary sources and categorized by two independent observers according to the ICF model: Impairment (symptoms), Activity (daily living and sport/ recreation), and Participation (psychosocial). To reduce redundancy, items with overlapping contents were condensed into representative formulation through consensus between the two observers.
Results: The literature search resulted in 3,284 records, of which 252 articles were included. Across these studies, 60 PROMs were identified, providing a total of 788 individual items. Following the condensation process, the item bank was reduced to 214 items. These were most frequently linked to the domain impairment (symptoms) (83), followed by participation restrictions (51), activity limitations in sports or recreational contexts (42), and activity limitations in daily activities (38). Within the impairment domain, the most frequently represented subdomains were knee instability (19 items) and pain (14 items), whereas fewer items were associated with activities such as running, jumping, and walking (one item each).
Interpretation / Conclusion: This study established a comprehensive, ICF-anchored item bank based on 60 PROMs used to assess patients with PFI, providing a key foundation for the development of a specific PROM for this population.

256. Psychological Readiness for Return to Sport Following Anterior Cruciate Ligament Reconstruction – A Descriptive Status at 12 Months Postoperatively

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Background: Reconstruction of the anterior cruciate ligament is commonly recommended for young, physically active patients who wish to return to high demand and cutting sport. To this end, return to sport is often considered the primary aim and a criterion for success of the surgery. However, a substantial proportion of patients do not successfully return to their pre-injury level of sport, and psychological readiness may represent a limiting factor.

Aim: The aim of this study was to assess psychological readiness to return to sport among Danish ACL-reconstructed patients 12 months postoperatively.

Materials and Methods: Patients who received primary ACL reconstruction completed the questionnaire Anterior Cruciate Ligament Return to Sport after Injury (ACL-RSI short form)[1,2] 12 months postoperatively. The ACL-RSI short form assesses psychological readiness on a scale from 0 to 100, with higher scores indicating greater readiness. Psychological readiness is presented descriptively as mean and standard deviation. A score on the ACL-RSI short form ≥60² is predictive of return to sport, whereas a score ≤39² predicts failure to return to sport1. In a ROC analysis of a Danish unpublished cohort, a score on the full ACL-RSI ≤45 was set as optimal cut-off for failure to return to preinjury sport 2. The proportion of patients meeting these cut-offs were calculated.

Results: A total of 119 patients (26 ± 5 years; 40% female, 60% male) completed the questionnaire at 12 months postoperatively. The overall ACL-RSI score was 44 ± 22 (Women 38 ± 20, Men 49 ± 23). 30 patients (25%) had an ACL-RSI score ≥60, of whom 21 (75%) were male. In total, 53 patients (44%) scored below the 39 cut-off, of whom 49% were male. Approximately half of the patients had a score ≤45 (63, 53%).

Interpretation / Conclusion: Psychological readiness to return to sport among Danish ACL-reconstructed patients appears to be low at 12 months postoperatively and lower among women. Approximately half of the patients had ACL-RSI scores at a level associated with failure to return to pre-injury sport.

257. Small country – large regional difference in the surgical treatment of recurrent patellar instability: 25% of patients treated with MPFL-R +/- TTO in Western Denmark would have been offered additional trochleoplasty in Eastern Denmark

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Background: Patella-femoral instability (PFI) has been treated differently in the western and eastern part of Denmark for the past decade. In 2009 the individualized Copenhagen PFI algorithm was introduced in Eastern of Denmark offering trochleoplasty (TP) and medial patellofemoral ligament reconstruction (MPFLR) to patients with high grade trochlear dysplasia (TD), defined by Dejour B/D in combination with a Lateral Trochlear Inclination angle (LTI) <11°. Concomitant tibial tubercle osteotomy (TTO) was performed if relevant. In the same period, patients in western Denmark were treated with MPFLR +/- TTO when severe high grade TD with mal tracking of the patella was excluded.
Aim: The aim of the study was to analyze a cohort of PFI patients treated with MPFLR +/- TTO in Western Denmark to assess the proportion of patients who according to the Copenhagen PFI algorithm would be offered TP.
Materials and Methods: This was a retrospective study evaluating pre-operative MRI and X-rays for all patients treated with MPFLR at Silkeborg Regional Hospital from 2020-2025. Variables of interest were the Dejour classification, LTI, Tibial Tuberosity Trochlea Groove distance (TTTG), Caton-Deschamps index (CDI) and Patella-trochlea Index (PTI). The outcome was the proportion of patients who according to the Copenhagen PFI algorithm would be offered TP.
Results: 150 knees (81 left) in 136 patients (92 female), Mean (SD) age 23.6 (9.1) were included. TTO was performed in 51/150 (34%). Mean (SD) LTI was 11.1 (5.6), TTTG 12.4 (3.9), CDI 1.2 (0.2), and PTI 0.31 (0.14). 70 patients had LTI<11 and among these 31 were Dejour type B and 6 were type D. 37/150 knees (24.7%) would according to the Copenhagen PFI algorithm have been offered TP.
Interpretation / Conclusion: 25% of patients treated with MPFLR +/- TTO in a cohort from Western Denmark would according to the Copenhagen PFI algorithm have been offered TP. Future studies are needed to investigate if this group of patients are satisfied with the less invasive treatment.

258. Return to sport and performance in football players following an ACL injury

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Background: Anterior cruciate ligament (ACL) injuries are among the most severe knee injuries in football, often resulting in surgical reconstruction and posing a threat to the player's active career. Knowledge on return to sport (RTS) and return to performance (RTP) following ACL injury in football players remains limited and is mainly based on elite and surgically treated cohorts.
Aim: To investigate the proportion of football players who return to football after an ACL injury and the level at which they return.
Materials and Methods: Patients with an ACL injury and football as their primary sport were identified in the Danish National Patient Register from 2000 to 2018. RTS and RTP were evaluated using a participant-reported questionnaire. RTP was defined as return to full participation in the same sport, at the same level, and with preinjury performance.
Results: A total of 7,870 players with ACL injury reported football as their primary sport, 5,931 intended to RTS and were included. Overall, 3,472 players (59%) RTS, while only 1071 (18%) successfully RTP. An additional 1,512 players (25%) returned to their preinjury level but with lowered performance. Players undergoing ACL reconstruction (ACL-R) had higher RTS rates compared with non-surgically managed players [60% vs. 53%; OR 1.38 (95%CI 1.21–1.58)]. RTS was also more frequent among male than female players [RTS: 60% vs. 52%; OR 1.47 (95%CI 1.30– 1.68)], regardless of treatment type. Furthermore, elite players were more likely to RTS than recreational players [63% vs. 56%; OR 1.33 (95%CI 1.18–1.49)]. RTP rates were similar across sex, age, playing levels and treatment strategies. The main barriers to RTS were knee instability, fear of reinjury and knee pain.
Interpretation / Conclusion: Return to football was achieved by 59%, but only 18% RTP following ACL injury. RTS and RTP rates were lower than previously reported, likely reflecting stricter RTP criteria and a heterogenous cohort. RTS was affected by sex, age, ACL-R and playing level. Overall, the findings reflect the long-term consequences of ACL injuries in football, resulting in reduced RTS and RTP and highlighting the need for improved injury prevention and targeted rehabilitation strategies.

259. Durable Clinical and Patient-Reported Outcomes Five Years After Open Hip Abductor Tendon Reconstruction

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Background: Surgical reconstruction of the hip abductor tendons is a relatively new procedure. Short-term follow-up studies report promising clinical and patient reported outcomes, but evidence on medium-term outcomes remains limited.
Aim: To investigate patient reported outcomes and level of patient satisfaction five years after open surgical reconstruction of the hip abductor tendons (Gluteus medius and/or minimus).
Materials and Methods: 42 patients (40 women) with a median (min; max) age of 62 (23;81) years, surgically reconstructed between December 2018 and January 2021, were included in the study. Patient reported outcome measures (PROMs) were evaluated pre-operatively (pre-OP), 1 and 5 year(y) post-operative (post-OP). PROMs included: subgroup 'Pain' from Copenhagen Hip And Groin Outcome Score (HAGOS), overall health (EQ-VAS), Lateral hip pain in rest and activity (NRS, 0-10), Global Rating of Change (GROC), along with a test of physical function (30 second chair-stand test (CST)). Patient satisfaction was asessed by 'Willingness to repeat surgery' and 'Patient acceptable Symptom State (PASS)'. Reconstructive HAT surgery to the contralateral hip were reported.
Results: From pre-OP to 1y post-OP, a mean change (95% Confidence Interval (CI)) was observed in the HAGOS subgroup 'Pain': 40 (33;47), EQ-VAS: 22 (15;30) and Lateral hip pain in rest: -4.2 (-5.2;-3.3) and activity -4.2 (-5.2; -3.6). From preOP to 1y post-OP, no significant changes were seen across PROMS. From 1y to 5y post-OP, succes on the GROC declined from 82.5% to 76.2%. Number of repetitions (reps) completed in the CST increased (mean change (95% CI)) from pre-OP to 1y post-OP (2.7 reps (1.6; 3.8))) and declined toward pre-OP level at 5y post-OP (-1.5 reps (-2.6; -0.6). By 5y post-OP, 95% of the patients were willing to repeat surgery and 88% were satisfied with current pain level (PASS). Nine patients had recieved reconstructive hip abductor tendon surgery to the contralateral hip during the follow-up period.
Interpretation / Conclusion: Five years after open hip abductor tendon reconstruction, a high level of patient satisfaction and good patient reported outcome scores were observed. These findings demonstrate satisfactory longevity of open surgical reconstruction.

POSTER WALK 7: SPORTS ORTHOPAEDICS / ARTHROSCOPY 2

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Martin Lind

Torsten Grønbech Nielsen

Posters 260–269

260. Spheroid-based matrix-induced autologous chondrocyte implantation combined with autologous bone grafting restores physiological cartilage and subchondral bone properties in osteochondral knee defects - An MRI-based analysis

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Background: Osteochondral knee defects have limited healing potential and require restoration of cartilage and subchondral bone. Data on spheroid-based matrix-induced autologous chondrocyte implantation with autologous bone grafting (MABCI) remain limited.
Aim: To evaluate radiological and clinical outcomes after MABCI and to analyse the association between imaging parameters and patient-reported outcomes.
Materials and Methods: In this retrospective cohort analysis of prospectively collected data, 28 patients with 29 defects of the femoral condyle (male: 15, female: 13, mean age 27.3 ±9.8 years, mean defect size 3.7 ±1.6 cm^2) treated with MABCI were included. Radiological assessments were performed using 3T MRI to evaluate cartilage thickness, T2 relaxation times and Magnetic Resonance Observation of Cartilage Repair Tissue (MOCART) 2.0 scores. Clinical outcomes were assessed using validated PROMs, including IKDC, KOOS, Lysholm, and PROMIS-29. Correlation analyses were conducted to evaluate associations between radiological parameters and PROMs.
Results: Mean follow-up was 44.4 ±21.6 months. Cartilage thickness in the repair tissue exceeded that of the reference cartilage (3.4 ±0.9 mm vs. 3.0 ±0.5 mm; $p = 0.036$). T2 relaxation times in the repair tissue were within physiological range (50.5 ±40.0 ms vs. 41.3 ±5.4 ms; n.s.). The mean MOCART 2.0 score was 61.3 ± 13.0 (volume fill: 16.1 ±3.7, integration with adjacent cartilage: 12.9 ±3.3), reflecting satisfactory repair quality. All clinical scores showed significant improvement compared to the preoperative condition (IKDC: 70.6 ±13.2 vs. 54.8 ±17.5, $p < 0.001$; KOOS: pain 78.7 ±16.9 vs. 66.1 ±18.6, $p = 0.002$, symptoms 75.6 ±16.0 vs. 65.8 ±19.1, $p = 0.006$, ADL 86.8 ± 14.0 vs. 77.6 ±16.8, $p = 0.003$, sport 63.0 ±24.2 vs. 47.3 ±26.9, $p = 0.009$, quality of life (QoL) 51.0 ±22.7 vs. 39.6 ±17.5, $p = 0.014$; numeric pain rating scale: 3.0 ±2.2 vs. 5.2 ±2.4, $p < 0.001$). A greater cartilage thickness was associated with reduced pain intensity ($r = -0.457$, $p = 0.013$) and improved QoL ($r = 0.429$, $p = 0.020$).
Interpretation / Conclusion: MABCI results in satisfactory cartilage regeneration and subchondral remodelling in addition to significant improvements in patient satisfaction and overall QoL.

261. Alignment First: Increasing Use of Knee Osteotomies in Sports Surgery—A Single-Center Analysis of Indications and Techniques.

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Background: Knee osteotomies are increasingly used as joint-preserving procedures in sports surgery. Growing focus on lower limb alignment in patellofemoral instability, ligament reconstruction, and joint preservation has expanded indications beyond traditional unicompartmental osteoarthritis.
Aim: To evaluate temporal trends in knee osteotomies at a specialized sports surgery unit and to describe indications and osteotomy types based on recent institutional
Materials and Methods: Procedure volumes from 2020 to 2025 were extracted from the electronic medical record system. In addition, data from two prospective institutional databases (patellofemoral instability and sports-related osteotomy surgery) were analyzed from July 2025 to May 2026. Indications and osteotomy types were categorized as axial (varus/valgus), slope-correcting, rotational, or combined procedures.
Results: A marked increase in osteotomies was observed over a five-year period, rising from 20 (2021) and 22 (2022) to 33 (2023), 50 (2024), and 58 (2025). From the databases (latest 10 months): In the patellofemoral instability cohort (n=105), 17% underwent osteotomy, including femoral (n=9) and tibial (n=2) derotation, and varus-producing procedures (n=7). In the sports-related osteotomy cohort (n=43), indications included ligament instability (47%), meniscal pathology (26%), cartilage lesions/osteochondritis dissecans (23%), and degeneration (21%). Osteotomy types included high tibial osteotomy (31% axial correction; 26% slope correction), distal femoral osteotomy (35% varus-producing; 10% valgus-producing), derotation (9%), and other procedures (7%). Double-level osteotomies accounted for 11%, and 12% were performed using patient-specific instrumentation (PSI).
Interpretation / Conclusion: Knee osteotomies are increasingly utilized, with a shift toward more individualized and complex corrections. This reflects a growing recognition of the importance of limb alignment in optimizing outcomes of ligament, cartilage, and patellofemoral surgery. Alignment correction is now frequently considered a prerequisite for successful soft tissue procedures.

262. Marked geographical variation in trochleoplasty rates across the Danish Realm: a nationwide study

Cemal Taha Karacan[1,2], Torsten Grønbech Nielsen[3], Peter Lavard[1], Simone Rechter[1], Christian Dippmann[1], Martin Lind[3], Kristoffer Weisskirchner Barfod[1,2]
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Background: Trochlear dysplasia is a major risk factor for recurrent patellar instability, and high-grade cases may require trochleoplasty. The extent of geographical variation in surgical treatment is unknown.
Aim: To investigate geographical variation in the incidence of trochleoplasty for high-grade trochlear dysplasia across the Danish Realm.
Materials and Methods: This nationwide retrospective cohort study included all patients undergoing trochleoplasty between 2017 and 2025 at the two national referral centers in Denmark. Residency at the time of surgery was obtained through civil registration data. Incidence rates per 100,000 person-years were calculated using population data from Denmark, Greenland, and the Faroe Islands.
Results: A total of 841 patients underwent trochleoplasty. Incidence rates varied by up to 30-fold ranging from 0.2 to 5.9 per 100,000 person-years. The highest incidence was observed in the Faroe Islands, with rates several-fold higher than most Danish municipalities. Clear regional clustering was observed, with higher rates in eastern Denmark and lower rates in western Denmark. The cohort was predominantly female (70%), with a mean age of 22.8 years.
Interpretation / Conclusion: There is marked geographical variation in the incidence of trochleoplasty across the Danish Realm. The particularly high incidence observed in the Faroe Islands may suggest a genetic contribution, while regional differences within Denmark likely reflect variation in clinical practice and referral patterns.

263. Redislocation rate after surgical treatment for patellar instability

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Background: Patellar instability is relatively rare, nonetheless with high impact on daily life. Surgical treatment is diverse and subject to changes in theoretical concepts. To date, clinical research investigating the various treatment options is mostly limited to case series using small samples.
Aim: This study aims to investigate the recurrence of patellar dislocation after various surgical treatments for patellar instability and evaluate the interrater reliability of preoperative radiological measurements.
Materials and Methods: A retrospective analysis of redislocation rate after different surgical treatments for patellar instability was conducted. Electronic patient files were manually checked for complications. Patients were sent a questionnaire regarding patellar redislocation, subsequent surgery, and a question regarding the confidence in their knee. Intraclass correlation coefficients (ICC) of preoperative radiological measurements were determined for the Caton-Deschamps index, Dejour, and Wiberg classification.
Results: A total of 112 procedures in 95 patients were included between January 2013 and December 2022. Dislocation of the patella after surgery was reported in 16 knees (14.3%). In 36 knees (32%) a second surgery was needed, mostly (22 knees (20%)) for hardware removal. The majority of patients (78%) were partial or fully confident with their knee after surgery. The ICC was 0.88 (95% CI: 0.82-0.91) for the Caton-Deschamps index.
Interpretation / Conclusion: The choice of surgical treatment for patellar instability varies enormously. Despite a patient tailored approach, still a considerable number of patellar dislocations was found. Improving preoperative radiological assessment may enhance surgical decision-making and ultimately improve patient outcomes.

264. Failure rate after Posterior Medial Meniscal Root repair. A retrospective cohort study based on prospectively collected routine clinical data

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Background: In Denmark, there is no consensus on the management of posterior medial meniscal root (PMMR) tears. Current treatment options include reinsertion, resection, or nonoperative management. Previous studies have reported variable survival rates after PMMR repair; however, these results often appear more favorable than those observed in routine clinical practice, suggesting a potential gap between published results and local clinical outcomes.
Aim: We aimed to examine the failure rate in patients undergoing transtibial PMMR repair and to explore potential associations between the risk of failure and preoperative patient and joint characteristics, including radiographic signs of arthrosis (Kellgren-Lawrence grade and medial joint space height), medial meniscus extrusion on MRI, and body mass index (BMI).
Materials and Methods: A journal audit was undertaken. Patients with transtibial PMMR repair were identified through surgery lists. Exclusion criteria were age under 40 or above 65 years, concurrent ACL injury or surgery performed less than 6 months prior to audit date. Primary outcome was failure verified by MRI. Preoperative meniscus extrusion was measured by MRI while arthrosis was evaluated by Xray when available. Failure rate was assessed by Kaplan-Meier. Preoperative characteristics were compared between patients with and without failure using Wilcoxon rank sum test, t-test or chi-2 test.
Results: Journals on 41 patients (71% female, mean age 52 years) were reviewed. Median follow-up was 16.7 months (range: 6.8-36 months). Thirteen failures were identified. Estimated failure rate at 12 months was 31% (95% CI: [19% - 49%]). No statistical significant associations between preoperative characteristics and failure were found, but a tendency towards higher BMI in the failure group was present (p=0.06).
Interpretation / Conclusion: Estimated failure rate at 12 months was 31%. However, due to a large confidence interval and lack of standardized clinical follow-ups inducing risk of underestimating failure, the result should be interpreted with caution.

265. Effects of Resistance Training for External Snapping Hip: Protocol for a Randomized Controlled Trial

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Background: External snapping hip is a condition characterized by a painful, audible, or palpable snap during hip movement, often accompanied by physical impairments. Progressive resistance training (PRT) has shown feasibility and acceptability in this population, but its clinical and cost-effectiveness has not been evaluated in a randomized controlled trial.

Aim: This protocol outlines the Snappy Hip trial, which will evaluate the effect of PRT versus no intervention on pain at 12 weeks and compare pain when PRT is initiated immediately versus after a 12-week delay.

Materials and Methods: The Snappy Hip Trial is a multicentre, randomized controlled trial. Participants with external snapping hip are randomized to either 12 weeks of PRT followed by 12 weeks of no intervention, or 12 weeks of no intervention followed by 12 weeks of PRT. The primary outcome is change in self-reported pain. Secondary outcomes include hip function, health-related quality of life, use of analgesics, healthcare utilization, and productivity loss. The analyses will follow the intention-to-treat principle and a mixed-effect model will be applied.

Results: NA

Interpretation / Conclusion: This is the first randomized trial comparing PRT to no intervention, as well as investigating the effect of delaying PRT, for people with external snapping hip. The trial will evaluate whether PRT reduces pain for people with snapping hip.

266. Transosseous Wrapping Technique Using Resorbable Suture Tape for Fixation of Osteochondral Lesions in the Knee Is a Safe Procedure Without Complications

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Background: Stable fixation of osteochondral lesions is challenging, as rigid fixation is required for bony healing. Conventional implants such as screws or bioresorbable nails provide stability but may cause loosening and detrimental cartilage damage. Transosseous fixation with resorbable suture tape avoids implant-related complications, as the material resorbs within weeks.
Aim: To describe a safe and cost-effective technique for fixation of osteochondral lesions in the patella and femoral condyles, and to evaluate healing using clinical outcomes and imaging.
Materials and Methods: Twenty-five consecutive patients (2017–2023) with repairable osteochondral fragments were treated using a transosseous suture “wrapping” or “umbrella” technique. The cohort included 15 traumatic lesions following patellar dislocation and 10 cases of osteochondritis dissecans of the femoral condyles. Mean age was 19 years (11–44) with 1–7 years of follow-up. Operative technique: Four to six transosseous K-wire tunnels were created at the defect margins, and two or three looped Vicryl tape sutures were passed over the reduced fragment and tied over the opposite cortex. Clinical records and imaging were retrospectively reviewed and outcomes classified as good/excellent, acceptable or failure.
Results: Clinical outcomes were good/excellent in 67% and acceptable in 33% of both patellar (n=15) and femoral lesions (n=10), with no clinical failures. MRI (n=10) showed good/excellent healing in 60%, acceptable in 20–40%, and failure in one femoral case (20%). Five patients required secondary surgery due to adhesions with stiffness. One patient with failed healing underwent fragment removal and subsequently received osteochondral allograft transplantation. No material-related complications were observed.
Interpretation / Conclusion: Transosseous suture fixation provides reliable stabilization of osteochondral lesions with good clinical outcomes and high healing rates while avoiding implant-related complications. The technique is safe, cost-effective, and is now used routinely at our institution.

267. Heavy Slow Resistance Training Plus Patient Education versus Patient Education Alone in Adults with Gluteal Tendinopathy: The GLUTEX Randomized Controlled Trial

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Background: Gluteal tendinopathy is a persistent musculoskeletal condition causing lateral hip pain and disability, affecting up to 24% of middle-aged women. Although exercise combined with patient education is recommended as first-line treatment, the added benefit of exercise beyond patient education alone remains unclear.
Aim: The primary aim is to investigate whether adding heavy slow resistance training to patient education is superior to patient education alone for improving disability after 3 months in adults with gluteal tendinopathy.
Materials and Methods: This protocol describes a multicentre, assessor-blinded randomized controlled superiority trial with a parallel-group design. Adults with clinically diagnosed gluteal tendinopathy will be recruited from hospitals, physiotherapy clinics, and through targeted social media advertisements. Following baseline assessment, 100 participants will be randomly allocated in a 1:1 ratio to 12 weeks of heavy slow resistance training combined with patient education (HSR+EDU) or patient education alone (EDU). Outcomes will be assessed at baseline and after 3, 6, and 12 months. The primary outcome is change in patient-reported disability measured by the Victorian Institute of Sport Assessment– Gluteal (VISA-G) from baseline to 3 months. Key secondary outcomes include lateral hip pain and global perceived effect. Other outcomes include pain self-efficacy, kinesiophobia, health-related quality of life, imaging-derived condition severity, functional performance, pain sensitization, and maximal isometric hip muscle strength. A patient advisory board is established to ensure patient perspectives inform all stages of the trial.
Results: Not applicable for this study protocol.
Interpretation / Conclusion: The GLUTEX trial will investigate the effects of adding heavy slow resistance training to patient education in adults with gluteal tendinopathy. Given the limited high-quality evidence to guide management, the findings may help inform future treatment recommendations.

268. Health-Related Quality of Life, Patient-Perceived Influencing Factors, and Work Participation in Subacromial Pain Syndrome

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Sports Orthopedic Research Center – Copenhagen (SORC-C), Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Denmark

Background: Subacromial pain syndrome (SAPS) is the most common cause of shoulder pain. Despite its high prevalence, the broader consequences for patients' health-related quality of life (QOL) remain insufficiently characterized.
Aim: To investigate and characterize: 1) health-related QOL in patients with SAPS and the factors perceived as most detrimental to it, and 2) work participation
Materials and Methods: This cross-sectional study included patients with SAPS recruited from an outpatient clinic using predefined and standardized diagnostic criteria. Patients were asked to complete the EQ-VAS (self-rated health, 0–100; 100 = perfect health) and the EQ-5D-5L (index scores range from −0.59 to 1, where 1 is the best possible, with the general healthy population having a reference score of 0.90 (SD ± 0.16)). The EQ-5D-5L is a standardized, validated measure of health-related QOL encompassing five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension is rated using a five-level scale reflecting the degree of impairment (none, slight, moderate, severe, or extreme/unable). In addition, patients were asked which factors they perceived as most detrimental to their health-related QOL, and about their current work participation.
Results: A total of 188 patients (60% women), with a mean age of 56 (SD ± 13) years, were included. Patients had a mean EQ-VAS of 57 (SD ± 22) and an EQ-5D-5L index score of 0.64 (SD ± 0.27). Across EQ-5D-5L dimensions, the proportion of patients reporting at least "slight" impairment was: mobility (29%), self-care (75%), usual activities (92%), pain/discomfort (98%), and anxiety/depression (38%). The factors patients perceived as most detrimental to their health-related QOL had the following themes: personal care (40%), sleep disturbance (37%), pain (35%), household activities (27%), overhead activities (16%), work (13%), sport (7%), and psychosocial factors (7%). Among non-retired patients, 58% worked full-time.
Interpretation / Conclusion: SAPS is associated with a substantial reduction in health-related QOL, with difficulties in personal care, household activities, and sleep representing the most commonly self-perceived detrimental factors.

269. Single-Puncture Ultrasound-Guided Barbotage for Large Chronic Supraspinatus Calcific Deposits: A Proof-of-Concept Study

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Sports Orthopedic Research Center – Copenhagen (SORC-C), Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Denmark

Background: Calcific deposits in the rotator cuff are associated with shoulder pain and decreased function. Barbotage is a technique for percutaneous removal of calcific deposits. Randomized controlled trials investigating the effectiveness of barbotage have reported conflicting results, which could be due to low rates of actual removal (46–56%). It has been hypothesized that the effect is higher for larger calcific deposits.
Aim: To develop and standardize a barbotage technique for large chronic calcific deposits in the rotator cuff, and to assess its feasibility, safety, and clinical and radiological outcomes.
Materials and Methods: First, a single-puncture ultrasound-guided barbotage technique performed under local anesthesia was developed. Second, the feasibility, safety, and clinical and radiological outcomes were evaluated in a prospective cohort of patients recruited from an outpatient clinic. Inclusion criteria: insidious onset of shoulder pain, positive Hawkins' and Jobe's tests; calcific deposit (Gärtner and Heyer type I) measuring > 10 × 5 mm in the horizontal plane with acoustic shadowing; symptoms > 6 months; previous physiotherapy and subacromial corticosteroid injections having proven ineffective. Exclusion criteria: radiological signs of ongoing spontaneous resorption; subacromial corticosteroid injection within the preceding 3 months.
Results: Ten patients (five women) with a mean age of 44 (SD±11) years were recruited during a 6-month period. All calcific deposits were located close to the supraspinatus tendon footprint. Barbotage was successfully performed in all patients with no or low reported discomfort during the procedure. Mean follow-up was 6 months. Complete removal of the calcific deposit was achieved in eight patients and near-complete removal in two. Mean improvement in Shoulder Pain and Disability Index (SPADI) was 24 points (SD:20; p=0.007). Two patients reported flare-up symptoms.
Interpretation / Conclusion: This barbotage technique appears feasible and safe, achieving high rates of calcific deposit removal and meaningful clinical improvement, thus supporting its use in clinical practice. The findings can inform the design of larger studies to evaluate its long-term outcomes.

POSTER WALK 8: SPINE

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Efe Aras

Casper Dragsted

Posters 270–279

270. EQ-5D vs SF-6D: Discrepancies in Measuring Health State Utility for Patients with Vertebral Compression

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Background: EuroQoL-5D (EQ-5D) and SF-6D are both designed to measure health states or utility but differ in questionnaire structure and scoring algorithm. This yields divergent results in several populations, at times favoring conflicting treatments in cost-effectiveness studies. The magnitude of this discrepancy in patients with osteoporotic vertebral compression fractures (OVCF) is unknown.
Aim: The aim of this study was to compare the health states and utility derived from EQ-5D and SF-6D, in patients scheduled for vertebroplasty due to an OVCF.
Materials and Methods: Preoperative EQ-5D and SF-6D from patients with OVCFs who were scheduled for percutaneous vertebroplasty were analyzed. Response distributions were evaluated for boundary effects. Discrepancy between utility scores was assessed by median difference and absolute agreement, which measures the tendency for EQ-5D and SF-6D to produce identical utility scores for the same patient.
Results: Paired EQ-5D and SF-6D from 736 patients were available for analysis. The most frequent response was the floor level in a single EQ-5D dimension (Pain) and in half of all SF-6D dimensions (Role Limitation, Pain, Vitality). The SF-6D utility was normally distributed with median 0.50 (range 0.30 to 0.91) whereas EQ-5D utility scores were bimodal with median 0.16 (range -0.594 to 1). SF-6D utilities were generally larger than EQ-5D: Median difference (SF – EQ) was 0.34 (range -0.51 to 1.08). Absolute agreement between the two instruments was poor: ICC = 0.158 (CI -0.019; 0.314).
Interpretation / Conclusion: EQ-5D and SF-6D are not interchangeable for patients with OVCF. Median differences are large, and SF-6D produces systematically higher utility scores than EQ-5D in patients with poor health while the reverse is true for good health. Aside from differing scoring algorithms, more widespread floor effects in SF-6D than EQ-5D may contribute to utility differences. Researchers are urged to be mindful of this discrepancy when interpreting health states and utility scores in economic evaluations of clinical trials.

271. Minimal Detectable Change of Kyphosis and Vertebral Height Measurements in Osteoporotic Vertebral Fractures

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Background: Local and fracture kyphosis angles and anterior vertebral height are widely used to assess progressive deformity in osteoporotic vertebral fractures (OVFs). However, the minimal detectable change (MDC) remains insufficiently documented.
Aim: To estimate inter- and intra-rater MDC95% of kyphosis and anterior vertebral height measurements in OVFs.
Materials and Methods: Lateral radiographs from a consecutive cohort of 62 patients with single OVFs were included. Four experienced spine surgeons independently measured local kyphosis angle (LKA) between the upper endplate of the vertebra above and the lower endplate of the vertebra below the fracture; fracture kyphosis angle (FKA) between the upper and lower endplates of the fractured vertebra. Anterior height ratio (AHR) was calculated as the average ratio of fracture height to the height of the adjacent vertebrae. Radiographs were duplicated and measured side by side (SBS), while measurements were hidden from the raters. LKA measurements were also repeated at a 14-day interval (test-retest). Raters were blinded from their own and the other raters' measurements. Measurement error was quantified by the minimal detectable change (MDC95%) using the formula $MDC95\% = SEM \times 1.96 \times \sqrt{2}$.
Results: For LKA, the average inter-rater MDC95% was 10.5° during test-retest and 6.1° for SBS measurements. The average intra-rater MDC95% was 9.1° and 4.2°, respectively. For FKA, the average inter-rater MDC95% was 10.2°, while the average intra-rater MDC95% was 4.5°. For AHR, the average inter-rater MDC95% was 19%, while the average intra-rater MDC95% was 10%.
Interpretation / Conclusion: We found comparable inter- and intra-rater measurement errors for LKA during test-retest measurements, while both inter- and intra-rater measurement errors were smaller for the SBS measurements. For LKA, FKA, and AHR, we found considerably smaller measurement error for intra- than for inter-rater measurements during SBS measurement. The results have direct implications for interpreting radiographic deformity progression in OVFs. Clinicians and researchers should pay attention to the conditions under which reported longitudinal measurements are made.

272. Clinical guideline on the use of CT for low-energy thoracolumbar fractures

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Background: In Denmark, low-energy thoracolumbar fractures are typically diagnosed using plain radiographs, often supplemented by computed tomography (CT), which offers greater details in fracture morphology and superior sensitivity. Given that surgical management of these patients is rare, however, uncertainty remains as to whether CT also provides clinical benefit by altering management.
Aim: To develop a clinical guideline on the use of CT imaging in older adults with acute low-energy thoracolumbar fractures diagnosed with plain radiographs.
Materials and Methods: Aided by a research librarian, a systematic literature search for guidelines, reviews, and primary studies was performed. The search was structured according to the following PICO question: Population: Acute, low-energy thoracolumbar fracture in adults aged ≥ 50 years without neurological deficit or ankylosing spondylitis in a hospital setting Intervention: CT in addition to plain radiographs Comparator: Plain radiographs alone Outcomes: Adverse events (critical): delayed neurological deficit, subacute surgery (<4 weeks) or delayed surgery. Other changes in treatment or complications. Screening was performed by medical doctors in duplicate using Covidence. In addition, a survey of the attitudes of spine surgeons towards CT was conducted. All spine surgeons at centers treating spine fracture were invited. The survey inquired about attitude towards CT use and the relevance of CT for a general case designed to match the PICO question.
Results: The search yielded 779 studies. After screening by title, abstract and full text, no relevant studies remained. Survey response rate was 86% (n = 24) and the use of CT was controversial: Though many surgeons did not consider CT relevant for this population, a considerable proportion did request CT to assess fracture stability and differential diagnoses. Several found 50 years of age too young a threshold for the context of low-energy fracture.
Interpretation / Conclusion: There is a need for further research to guide the future use of CT for patients with low-energy thoracolumbar fractures and a higher age threshold than 50 years is recommended. The working group recommends the use of CT when deemed relevant to treatment decision.

273. Understanding the Impact of Etiology on Mechanical Revision Rates and Patient-Reported Outcomes in Adult Spinal Deformity Surgery

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Background: Patients with ASD are characterized by large variations in comorbidities, age, etiologies, and surgical needs. Outcomes are often reported as one ASD group.
Aim: To analyze differences in mechanical revision rates and patient-reported outcomes (PROs) among patients with ASD by underlying etiology.
Materials and Methods: Patients undergoing ASD surgery at a single center from 2017 to 2023 were included with 2- year follow-up. Patients were divided by deformity etiology: de novo, idiopathic, iatrogenic, and other less common conditions (e.g., congenital, neuromuscular, Bechterew, fracture sequelae). The primary outcome was 2- year revision rates for mechanical failure (e.g., rod breakage, proximal junctional failure [PJF], drophead, etc.), which were compared between groups using logistic regression and multivariate adjustment for other clinically relevant factors (sex, age, BMI, CCI score, instrumented levels, and three-column osteotomy). Secondary outcomes were pre- and 2-year postoperative SRS-22r scores, compared between groups using a mixed-effects model.
Results: A total of 451 patients were included. The idiopathic group was significantly younger, healthier, with a lower BMI, and less extensive surgery. Overall mechanical revision was 18%, highest in de novo (25%) and lowest in idiopathic (9.2%). Revision rates for de novo and iatrogenic deformity were significantly higher than for idiopathic scoliosis (OR 3.27, 95% CI 1.49-7.51 and 2.84, 95% CI 1.41-6.15, respectively). In the multivariate analysis, only the number of instrumented levels was significantly associated with revisions (OR 1.08, 95% CI: 1.01-1.15). Patients with idiopathic disease had higher preoperative SRS-22r scores, although no significant pre-to-postoperative change was observed between the groups. All groups improved significantly from baseline to 2 years postoperatively. The idiopathic group had significantly higher satisfaction scores (4.29±0.12, $p<0.001$).
Interpretation / Conclusion: Revision rates differ across ASD etiologies, but improvements in PRO scores are similar. "ASD" is an imprecise term that does not reflect the risk of mechanical complications. This should be considered in treatment planning, research, and patient counseling.

274. Preoperative Pain Dominance (Leg Pain vs Back Pain) as a Predictor of Postoperative Outcomes After Lumbar Spine Surgery: A Scoping Review

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Background: Preoperative pain dominance, whether patients present with predominantly leg or back pain, is frequently considered when counselling patients before lumbar spine surgery. However, its prognostic value remains debated and the evidence has not been systematically mapped.
Aim: To map the literature on preoperative pain dominance as a predictor of postoperative outcomes including patient satisfaction after lumbar spine surgery.
Materials and Methods: This scoping review followed JBI methodology and PRISMA-ScR guidelines. PubMed, Embase, Cochrane Library, and Web of Science were searched up to February 2026. Studies of adult patients undergoing lumbar spine surgery reporting separate preoperative leg and back pain measures and their association with postoperative outcomes were eligible. Citation tracking for all included studies was performed to identify additional publications. Two reviewers independently screened and extracted data using a standardised charting form.
Results: 31 studies involving more than 75,000 patients published between 1995 and 2026 across 12 countries were included. Substantial heterogeneity was found in the definition and measurement of pain dominance. While most studies used VAS- or NRS-informed pain measures, operationalisation varied considerably, including numerical comparison, self-report, and surgeon determination. 14 studies reported better outcomes with predominant leg pain on at least one measure, 11 found no clear between-group difference, and 6 reported mixed findings. Leg pain dominance more often favoured outcomes in spinal stenosis treated with decompression, whereas studies of spondylolisthesis treated with fusion more often reported no difference. Patient satisfaction was assessed in only 11 studies using diverse instruments.
Interpretation / Conclusion: The literature is extensive but characterised by substantial definitional and methodological heterogeneity. While a trend towards better outcomes with leg pain dominance exists, particularly in stenosis treated with decompression, many studies report no clear difference. Standardised definitions and consistent assessment of patient satisfaction are needed to support future systematic reviews.

275. Kinematic effects of cervical collars in unstable C5–C6 fracture injuries. An experimental study using dynamic radiostereometry

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Background: Cervical collars have been used in trauma care to prevent secondary spinal cord injury, although their clinical benefit remains debated. While cervical collar stabilization during conservative treatment of fractures is widely accepted, the evidence supporting the acute stabilizing effect of cervical collars in trauma care is contested. Hence, there is great variation in prehospital and in-hospital management of cervical fractures from routine application to complete abandonment.

Aim: To compare the stabilizing effect of three different cervical collars on unstable C5–C6 cervical spine fractures.

Materials and Methods: Ten fresh-frozen human specimens were exposed to a surgically induced unstable C5– C6 fracture. The injury model consists of a combined unilateral C6 facet joint fracture, an anterior C5 vertebral body edge fracture (tear drop/avulsion), and a rupture of the C5–C6 intervertebral disc. Physiological head flexion and extension were simulated using a robotic arm. Dynamic radiostereometric analysis (dRSA) of cervical vertebral motion was recorded under four conditions: 1) no cervical collar, 2) fitted rigid cervical collar, 3) ambulatory rigid cervical collar, and 4) soft cervical collar. The intervertebral kinematics were calculated using 2D-3D image registration of digitally reconstructed radiographs of CT-generated bone models (translations and rotations).

Results: Preliminary findings (n=1) demonstrate that all cervical collars reduce the overall head range of motion compared with no collar. Without a collar, cervical motion exhibited 68° of flexion and 35° extension. A fitted rigid collar, reduced the head flexion to 33° and extension to 24°. An ambulatory rigid collar reduced the head flexion to 34° and extension to 26°. A soft collar reduced the head flexion to 46° and extension to 21°. The primary outcome - intervertebral motion at the C5–C6 fracture level - has not yet been analyzed.

Interpretation / Conclusion: Preliminary results indicate that cervical collars reduce global head motion in flexion and extension, with rigid collars providing the greatest restriction. Whether this translates into clinically relevant stabilization of an unstable C5– C6 fracture will be analyzed and presented at the NOF meeting.

276. From Fracture to Referral: Timing and Pathways for Assessment of Osteoporotic Vertebral Fractures

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Background: Osteoporotic vertebral fractures (OVFs) are common in older adults and require timely assessment for effective management and registry research. National guidelines recommend considering vertebroplasty within 2–8 weeks of fracture if non-surgical treatment fails. However, referral timing and pathways to specialist assessment remain poorly described.
Aim: To examine the timing and referral pathways for patients with symptomatic OVFs assessed at an orthopaedic outpatient clinic in a regional hospital.
Materials and Methods: Patients ≥50 years referred for assessment of an OVF at the Department of Orthopaedic Surgery, Zealand University Hospital, Køge, from December 2024 to June 2025 were screened. Follow-up from admission in our own department was excluded. The referral pathway and the time from fracture to referral were recorded.
Results: 84 patients were identified; 18 were excluded, leaving 66 for analysis. The mean age was 72 years (SD 11). The median time from fracture to referral was 25 days (interquartile range: 12-93; range (min-max): 0-371). 36% were referred after 6 weeks and 27% after 3 months. Referral sources were the emergency department (38%), general practitioners (35%), orthopaedic departments from other hospitals (11%), internal medicine (11%) and oncology (6%).
Interpretation / Conclusion: Substantial variation in referral timing was observed, with one in four patients referred more than 3 months after fracture. Six distinct referral pathways were identified. Late referral may preclude timely vertebroplasty consideration within the guideline-recommended window of 2–8 weeks. Also, national registry data (LPR) that rely on the date of OVF diagnosis at a hospital can be misleading regarding fracture acuity.

277. Improvement of aestetics in scoliosis patients using Pattern Specific Rehabilitation (SBP)

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Background: Among patients with scoliosis body asymmetry is a primary concern and improved aesthetics is often a goal of treatment. Most studies on Physiotherapeutic scoliosis-specific Exercises (PSSE) focus on radiographic improvement of Cobb angle, trunk rotation and patient objectives as pain relief as the primary target for improvement.
Aim: The aim of this study is to report the objective measured aesthetic improvement by TRACE (Trunk Aesthetic Clinical Evaluation), in patients with scoliosis treated with PSSE (Schroth Best Practice).
Materials and Methods: Data was collected at two different specialist scoliosis clinics, both treating AIS patients by PSSE (Schroth Best Practice). Patients with scoliosis were included in the study based on the inclusion criteria: AIS, age 15-45 years, radiographs available prior to treatment, no previous spine surgery and follow up assessment after at least 12 weeks of PSSE training. Patients were classified according to their curve type (thoracal, lumbar, thoracolumbar and double). The thoracal and lumbar angle of trunk rotation (ATR) was measured prior to treatment and at follow-up. Objective evaluation of aesthetics was performed by using the TRACE tool. Evaluation was performed by two independent blinded assessors: an spine surgeon and a physical therapist with more than 10 years of experience.
Results: A total of 169 patients were included in the original cohort, of which 111 (65.7%) had complete data available with radiograph, ATR and TRACE scores before and after PSSE and completed their training program. Overall PSSE was associated to better aesthetic outcomes (mean change in TRACE -1.4, sd 1.4), with a difference in lumbar (mean -1.1, sd 1.2) and thoracal/thoracolumbar (mean -1.6, sd 1.5). In lumbar curves the mean lumbar ATR decreased by 2.0 degrees, with thoracic ATR decreasing by 0.4 degrees.
Interpretation / Conclusion: This is the first study to demonstrate, that PSSE is associated to a correction of the aesthetic outcomes, when rated by two blinded observers using the TRACE scale. It further suggests that the change in ATR corresponds to the curve type and PSSE training and that a derotation of the curve is present if patients are adherent to their program.

278. Why are patients hospitalized after lumbar decompression with or without discectomy

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Background: Lumbar decompression with or without discectomy is a commonly performed procedure. Same day discharge is increasingly implemented, yet practice varies substantially between hospitals.
Aim: The aim of this study was to determine the proportion of patients who met standard same day discharge criteria after lumbar decompression with or without discectomy, as well as the reasons why patients remained hospitalized.
Materials and Methods: We conducted a prospective cohort study between October 2025 and January 2026 at an institution that does not routinely offer spine surgery as same day surgery. Inclusion criteria were age ≥18 years, planned lumbar decompression with or without discectomy, and informed consent. Exclusion criteria included revision surgery, procedures involving >2 levels, ASA >2, Clinical Frailty Scale (CFS) >3, cognitive dysfunction, gait impairment (use of walking aids or inability to mobilize independently preoperatively), daily opioid consumption ≥30 mg morphine equivalents, poorly regulated diabetes (HbA1c >70 mmol/mol or fasting glucose >14 mmol/L), and surgery starting after 1 p.m. All patients were assessed at 6 p.m. on the day of surgery according to standard discharge criteria.
Results: Of 73 eligible patients, 46 were excluded for one or more reasons: 22 due to ASA score, 10 due to gait impairment, 10 due to late surgery start, 8 due to CFS, 2 withdrew consent, and 1 due to opioid use. Among the 27 included patients, 6 (22%) met all discharge criteria. An additional 7 patients (26%) had no symptoms preventing discharge but were awaiting physiotherapy assessment (6) and/or drain removal (3). The most common symptoms preventing discharge were nausea and/or dizziness in 8 patients (30%), and 3 of these also experienced unacceptable pain during ambulation. Four patients (15%) had been prescribed bed rest until the first postoperative day.
Interpretation / Conclusion: Nearly half of the included patients had no symptoms preventing same day discharge at 6 p.m. following lumbar decompression with or without discectomy. With minor logistical adjustments, these patients would likely be suitable for same day discharge.

279. Activity patterns and patient complexity in a nurse-led orthopaedic perioperative pain service: A convergent mixed-methods evaluation

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Background: Elective orthopaedic patients with complex pain profiles, long-term opioid use, or psychosocial vulnerability often do not fit standardised surgical pathways. Fragmented care and insufficient attention to biopsychosocial factors may compromise outcomes. PainCare was developed as a telephone-based nurse-led initiative to address these gaps through early identification, perioperative planning and optimisation, and cross-sector collaboration.
Aim: To evaluate activity patterns, patient characteristics, and clinical functions of PainCare in elective orthopaedic surgery.
Materials and Methods: A quality improvement mixed-methods study was conducted. Three data sources were combined. The primary analysis consisted of registry-based BI-data (2021–2025) examining activity volume, referral patterns, and contact types, and a structured journal audit (n=150) assessing clinical complexity, opioid use, comorbidity, and intervention components. Qualitative data (focus group) were analysed to contextualise quantitative findings and explore mechanisms of impact.
Results: BI data demonstrate stable and sustained activity over time, indicating institutional integration. The journal audit shows that PainCare serves patients across orthopaedic surgical specialties with high clinical and psychosocial complexity, including preoperative opioid use, substance misuse, concerns about surgery and multimorbidity. For nine out of ten patients, the PainCare-service involves less than five telephone contacts addressing medication optimisation, expectation alignment, perioperative planning, and cross-sector coordination. Qualitative findings suggest that the service added value lies in proactive responsibility, relational continuity, and mobilisation of clinical nursing judgement, supporting surgical trajectories for vulnerable patients.
Interpretation / Conclusion: Quantitative data confirm that PainCare addresses a clinically complex patient group with needs not adequately met and managed within standard clinical pathways. Supported by qualitative insights, the findings indicate that a nurse-led service may strengthen perioperative safety and coordination in elective orthopaedic care.

POSTER WALK 9: SHOULDER/ELBOW

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Josephine Olsen Kipp

Theis Thillemann

Posters 280–281, 283–289

280. Proximal humerus fracture displacement and association with osteoporosis in patients aged ≥50 years

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Background: Proximal humerus fractures (PHFs) are common injuries among older adults and associated with osteoporosis. As an index PHF increases the imminent fracture risk, secondary fracture prophylaxis is a major concern. It is commonly assumed that severe displacement after a minimal trauma reflects weakness of bone. However, whether the presence of displacement can be used as a predictor of bone strength in patients with PHF is unclear.
Aim: To determine the prevalence of osteopenia and osteoporosis in a Danish population of patients ≥50 years with PHF and to examine the association between presence of fracture displacement and bone strength defined by T-score.
Materials and Methods: A chart review of 612 consecutive patients aged ≥50 years with low energy PHF, who completed Fracture Liaison Service (FLS) evaluation including dual energy X ray absorptiometry (DXA) scanning of the total hip, femoral neck, and lumbar spine at a Danish university hospital between 2020– 2025. Osteoporosis is defined by a T score ≤ –2.5 and osteopenia by a T score between – 2.5 and –1 measured by DXA, and represents osteoporosis identified at the time of fracture, not previously known disease. Fracture displacement was assessed on anteroposterior and lateral radiographs and defined as ≥1 cm displacement or angulation ≥45° between the four segments of the proximal humerus.
Results: Median age 72 years, 84,5 % were woman. Of the 612 patients, 62 % of the fractures were displaced. Overall, 10.1% had normal BMD, 41.6% had osteopenia, and 48.3% had osteoporosis. When BMD was modeled as an ordinal variable (normal BMD, osteopenia, osteoporosis), having a displaced fracture was associated with a higher odds ratio of having a low BMD (OR 1.32; 95% CI 1.02–1.72; p = 0.038).
Interpretation / Conclusion: Nearly half of all evaluated PHF patients had osteoporosis, and the vast majority had low BMD . Although fracture displacement was associated with osteoporosis, the prevalence remained high across all groups. Therefore, we recommend routine assessment of osteoporosis with secondary fracture prevention, irrespective of fracture displacement.

281. Scapular muscle recruitment in patients with snapping scapula compared to healthy controls - an exploratory electromyographic study

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Background: Snapping scapula (SS) is a painful condition with multifactorial etiology, and most patients are initially treated non-operatively because they present symptoms that reflect functional deficits. Rehabilitation should be individualized to each patient's modifiable muscle impairments, but the relevant scapular muscle performance patterns are still not well understood or defined.
Aim: To evaluate scapular muscle recruitment in patients with chronic SS during a sample of rehabilitation exercises, compared to a matched control group and to explore muscle activity differences within the exercises.
Materials and Methods: From June 2020 to June 2025, forty patients diagnosed with SS and forty matched healthy controls were examined in a cross-sectional study. Surface electromyography (EMG) measurements were obtained from four scapular muscles (upper trapezius (UT), middle trapezius (MT), lower trapezius (LT), and serratus anterior (SA)) during seven rehabilitation exercises including 3 elevation, 2 external rotation (ER), and 2 protraction exercises. Differences between the SS patients and healthy controls, as well as muscle activity differences within the three exercise clusters of elevation, ER, and protraction, were examined in the statistical analysis.
Results: Overall, SS patients showed higher EMG activity levels in the scapular muscles during the exercises, compared to healthy controls. Across both groups we found that adding ER to elevation exercises decreased upper trapezius (UT) activity and increased lower trapezius (LT) activity, and in side-lying ER, compared to standing ER, more MT, LT and SA activity was found. Furthermore, in SS patients UT activity decreased in side-lying ER compared to standing ER. In addition, performing protraction exercise at 120° of elevation, compared to at 90°, elicited more EMG activity in UT, MT, and SA.
Interpretation / Conclusion: Patients with SS require a greater proportion of their maximal muscle capacity to perform the same workload, indicating reduced muscular efficiency. We must be cautious about the load in exercises for these patients, as even a low external load demands relatively more of them than of healthy controls.

283. The Dutch patient-based Constant-Murley score cannot be used interchangeably with the clinician-based Constant-Murley score

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Background: To monitor shoulder function in patients with shoulder arthroplasty (SA) and to evaluate the effectiveness of shoulder interventions, the Constant Murley score (CMS) is widely used in clinical practice and research. However, the CMS is time-consuming, taking time away from shared decision-making and patient counseling. In an effort to negate these time constraints, several authors have developed or translated a patient-based CMS (pCMS) to enable CMS collection outside consultation visits.
Aim: The primary aim of our study was to translate the English p-CMS into Dutch and to assess absolute agreement between the p-CMS and c-CMS versions in patients undergoing shoulder arthroplasty. The secondary aim was to analyze the test-retest reproducibility of both the Dutch p-CMS and c-CMS.
Materials and Methods: The English p-CMS was translated into Dutch using forward and backward translation. We administered the cCMS and p-CMS at two time points before surgery, and six months after surgery. Subsequently, we calculated absolute agreement parameters between p-CMS and c-CMS to study interchangeability. For the repeated measurements of c-CMS and p-CMS, agreement was calculated separately to study test-retest reproducibility.
Results: We recruited 139 patients from three different hospitals. Between the total scores of the p-CMS and c-CMS, the 95% limits of agreement (LoAs) were -20.4 to 22.6 with a mean bias of 1.1. For test-retest reproducibility of the c-CMS and the p-CMS, LoAs were -15.1 to 15.7 (mean bias 0.3) and -16.6 to 18.8 (mean bias 1.1), respectively. These LoAs were all wider than the shoulder arthroplasty-specific minimal clinically important differences (MCIDs) found in the literature.
Interpretation / Conclusion: The p-CMS cannot be used interchangeably with the c-CMS. In addition, we argue that the CMS has become obsolete for quantifying shoulder functionality; shoulder-specific PROMs with better reproducibility are currently available.

284. Patient-Reported Outcome after Total Elbow Arthroplasty and Elbow Hemiarthroplasty for Acute Distal Humeral Fracture: A national multicentre study with 2 to 15 years of follow-up

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Background: Elbow hemiarthroplasty (EHA) is used as an alternative to total elbow arthroplasty (TEA) in the treatment of unreconstructable acute distal humeral fractures, but there are only few studies comparing outcomes after the two arthroplasty types and very few with long-term follow-up.
Aim: The aim of this study was to compare the Oxford Elbow Scores (OES) of patients with acute distal humeral fractures treated with primary TEA or EHA.
Materials and Methods: This study was a national retrospective cohort study with cross sectional follow-up. Data was collected by review of electronic health records. A logistic regression model was fitted to assess the association between the type of primary arthroplasty (TEA/EHA) and the odds of reaching the patient acceptable symptom state (PASS) for the OES, adjusted for sex, age, and BMI.
Results: We included 88 primary TEAs and 88 primary EHAs. Median follow-up was 5 years in both groups. Mean OESs were 36.7 (SD 9.4) in TEA-patients and 38.5 (SD 10.6) in EHA-patients. The mean difference in OES was 2.8 (95% CI -0.5, 6.1) in the EHA-group with the TEA-group as reference. At follow-up 59 (67%) TEA-patients and 71 (81%) EHA-patients had reached PASS. The odds ratio of reaching PASS was 2.28 (95% CI 1.42, 5.54) in the EHA-group with the TEA-group as reference.
Interpretation / Conclusion: The mean OESs were similar for patients treated with primary TEA or EHA due to acute DHF. However, primary EHA was associated with higher odds of reaching the PASS-value for the OES. External validation of the PASS-value for the OES, and evaluation of long-term functional and radiographic outcomes, would be valuable for further evaluation of primary TEA and EHA due to acute DHF.

285. Outcome of Revision Arthroplasty after Failed Total Elbow Arthroplasty or Elbow Hemiarthroplasty in Patients with Acute Distal Humeral Fracture

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Background: Primary elbow arthroplasty is an established treatment of acute distal humeral fractures not amenable to open reduction and internal fixation, but the revision rates are high. Nonetheless, there are only few studies reporting outcomes after revision in this situation.

Aim: The aim of this study was therefore to report the type and outcome of revision arthroplasty in patients previously treated with a total elbow arthroplasty (TEA) or hemiarthroplasty (EHA) due to an acute distal humeral fracture.

Materials and Methods: The study was a national retrospective cohort study with prospective cross-sectional follow-up. Baseline data was collected from electronic health records and included demographic data, surgical data for the primary arthroplasty, reason for revision, surgical data for the revision procedure, and the need of a second revision. The primary outcome was the Oxford Elbow Scores (OES) at follow-up.

Results: Forty first-time revisions were performed in the study period. With a median follow-up of 3 years [Range 0-10], 31 patients were alive at the time of follow-up of which 27 (87%) answered the OES. Median OES was 30 [Range 9-48] and 13/27 patients reached the Patient Acceptable Symptom State (PASS) of 33 points for the OES. Univariable linear regression estimated a mean difference in OES of 1.4 points [95% CI -9.1, 11.9] for EHA relative to TEA.

Interpretation / Conclusion: Mean OESs were comparable after revision of primary TEA or EHA. Although there were too few patients for safe estimates, the potential differences might not be clinically relevant. However, less than half of the patients reached the PASS-value for the OES, and the humeral component was only preserved in a third of the revisions of EHA. These findings suggest that a substantial number of patients can expect an unacceptable result after revision arthroplasty, underlining that elbow arthroplasty should be used with caution in the treatment of acute distal humeral fractures.

286. Changes in supraspinatus integrity and muscle volume one year after tendon reinsertion: a retrospective MRI cohort study (2016–2020)

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Background: Rotator cuff tears, particularly of the supraspinatus tendon, are associated with progressive muscle atrophy and fatty infiltration. Although rotator cuff repair can restore tendon integrity, previous studies have primarily focused on structural healing or preoperative prognostic factors. Longitudinal MRI studies have shown inconsistent changes in supraspinatus muscle morphology after repair. Consequently, the relationship between tendon integrity and postoperative muscle recovery remains unclear.
Aim: To evaluate structural and muscular outcomes one year after supraspinatus reinsertion and to assess whether successful tendon healing is associated with preservation or improvement of muscle morphology.
Materials and Methods: This retrospective cohort study included 31 patients (mean age 59.7 years, range 45–73; 19% female) undergoing rotator cuff repair with available pre- and 1-year postoperative MRI. Tendon integrity was assessed using the Sugaya classification. Muscle morphology of the supraspinatus muscle was evaluated using occupation ratio, cross-sectional area (CSA) at the suprascapular notch, tangent sign, and fatty infiltration assessed on PD-weighted MRI.
Results: At one year, 24/31 patients (77%) demonstrated intact tendon repair, while 7/31 (23%) had structural failure. Among patients with intact repair, only 13/24 (54%) demonstrated an increase in occupation ratio and/or cross-sectional area at one year. Fatty infiltration and tangent sign remained largely stable over time, with no clear reversal of advanced muscle degeneration.
Interpretation / Conclusion: Reinsertion of the supraspinatus tendon is associated with favourable structural outcomes in the majority of patients. However, improvement in muscle morphology was observed in only approximately half of patients with intact repair. These findings suggest that restoration of tendon integrity does not consistently result in recovery of muscle morphology. Future studies should investigate whether postoperative muscle morphology following successful supraspinatus tendon reinsertion is associated with functional and patient-reported outcomes.

287. The Latarjet procedure in patients with epilepsy: a retrospective cohort study from a tertiary shoulder center in Denmark

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Background: The Latarjet procedure is widely used for recurrent anterior shoulder instability with bone loss. Patients with epilepsy represent a high-risk subgroup due to recurrent seizures, potentially increasing the risk of graft failure, non-union, and recurrent instability. However, outcomes in this population remain poorly described, and evidence to guide surgical decision-making is limited.
Aim: To determine the prevalence of epilepsy in a Latarjet cohort and to evaluate associated clinical characteristics, postoperative seizure activity, and revision rates.
Materials and Methods: We conducted a retrospective cohort study including all Latarjet procedures performed for anterior instability at a tertiary shoulder unit between April 2020 and April 2025. Medical records were systematically reviewed for demographics, epilepsy diagnosis, seizure activity, radiological findings, and revision surgery. Detailed information on subgroups with ≤2 patients was omitted to ensure patient anonymity.
Results: A total of 151 procedures were performed in 129 patients. Fifteen patients (12%) had epilepsy, of whom 12 had idiopathic generalized epilepsy. In this group median age was 26 (range 17-46) and tthe patients had a preoperative seizure-free period with a median of 9 months (range 2–72). Postoperatively, 9 of 15 patients experienced at least one seizure. The median time to first seizure was 6 months (range 2–54). Among the 9 patients with postoperative seizures, 3 underwent revision for reasons attributable to the seizures.
Interpretation / Conclusion: Patients with epilepsy undergoing the Latarjet procedure have a high rate of not only postoperative seizures but also revision surgery. Epilepsy appears associated with need of revision following the latarjet procedure. These findings suggest that risk of postoperative seizures and need of revision surgery should be explicitly considered in surgical indication, perioperative management, and patient counseling.

288. Why in hospital? A descriptive study of patients having shoulder arthroplasty as either admitted or outpatient

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Background: Total shoulder arthroplasty (TSA) is less common than hip or knee arthroplasty, but shares similarities with these major orthopedic surgeries. In Denmark, approximately 1.200 TSA are performed annually, typically requiring only one night in hospital. However, in contrast to hip and knee arthroplasties, there are few studies exploring whether an overnight hospital stay is necessary after TSA and what specific challenges may impede postoperative recovery. Additionally, the suitability of patients for outpatient TSA has not been thoroughly investigated within a socialized healthcare system, despite promising outcomes reported from the U.S. regarding outpatient TSA.
Aim: This study aims to examine the percentage of patients who are not discharged within the first three postoperative days, along with an explanation of the reasons for their extended hospital stay. Patient characteristics in the group of admitted and outpatient are described. Additionally, the study will quantify satisfaction and recovery postoperatively, as well as health care contact within the first month postoperatively.
Materials and Methods: Postoperatively patients will be evaluated twice daily and the reasons for the patient being hospitalized registered. Twenty-four and 48 hours postoperatively the patient will receive an SMS-based electronic questionnaire, assessing their satisfaction and recovery using the Quality of Recovery 15 (QoR15). One month postoperatively the patient received the QoR15 and a short survey on health-care contacts and satisfaction.
Results: Preliminary results show that half of the patients were admitted. In the group of admitted patients a higher ratio lived alone, while no difference in gender, age, ASA and clinical frailty score was detected among the group of admitted patients and outpatients. The most common reason for admission was dizziness and nausea. No difference concerning pain, having a good sleep and satisfaction concerning the postoperatively course was found in the two groups. Likewise, no difference within the first month in healthcare contact and re-admission were found.
Interpretation / Conclusion: A special focus on patients living alone should be conducted in order to reduce the number of admitted patients.

289. Treatment of shoulder pain with cryoneurolysis - a single center follow up

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Background: Patients with shoulder pain and no option of surgical treatment at the Department of Orthopaedics at Gentofte Hospital were offered cryoneurolysis.
Aim: This study aims to investigate the effect reported by patients treated with cryoneurolysis at 3-week follow-up.
Materials and Methods: Between 2020 and 2025, 97 patients were referred to cryoneurolysis. 71 patients received 107 treatments. Data on diagnoses, previous treatment, physical status, age, ethiology and cryotreatment was collected from the medial chart. Outcome 3 weeks posttreatment was divided into three domains: Pain, functionality and life quality. If available, data on outcome at longer follow up was collected. Results are given for each treatment.
Results: Referral diagnoses were: glenohumeral osteoarthritis (43), degenerative disorders (41), shoulder pain with no structural cause (12), postoperative pain (10), traumatic pain (10), instability (6), frozen shoulder (6), neurogenic pain (3) and lateral epicondylitis (3). 26 patients did not receive treatment due to; no effect of diagnostic block, other health problems, spontaneous improvement, other treatment, no contact, or were not interested. 52 (48.6 %) treatments led to decreased pain. 37 (34.6 %) had no change of pain and 5 (4.7 %) led to worsening. 13 (12.1 %) were lost to follow up. Treatment due to degenerative disorders resulted in decreased pain in 17 of 30 (56.7 %) cases. 43 (40.2 %) had improved functionality. 39 (36.4 %) had no change in functionality and 1 (0.09 %) led to worsening. 24 (22.4%) were lost to follow-up. 39 (36.4 %) reported with improved life quality. 34 (31.2 %) experienced no change, 3 (0.03 %) experienced worsening, and 31 (29.0 %) had no follow-up. No systematic long-term follow-up was done. 55 had follow-up longer than 3 weeks. 30 (54.5 %) patients had beneficial effect for more than four weeks and up to 4 years.
Interpretation / Conclusion: Results show that 48.6 % benefit from cryoneurolysis at three weeks posttreatment. Results indicate that patients with degenerative disorder benefit most from cryoneurolysis. Approximately one third benefit from cryoneurolysis more than four weeks. Further study must be done to determine long term effect of the treatment

POSTER WALK 10: PEDIATRICS 1

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Maria Tirta

Christian Wong

Posters 290–299

290. Early Postoperative Weight Trajectories After Lower-Extremity Reconstruction And Their Relationship With Bone Healing Indices: A Longitudinal Cohort Analysis

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Background: Lower-limb reconstruction places metabolic demands on patients. Serial body weight may provide a clinical marker of surgical stress, reduced mobility, nutritional status, and the energetic demands of tissue regeneration, yet postoperative weight trajectories remain poorly characterised
Aim: To characterise early postoperative weight-change trajectories across 4 lower-limb reconstruction strategies and to explore whether early postoperative weight loss is associated with less favourable bone healing
Materials and Methods: Longitudinal cohort of patients undergoing lower-limb reconstruction between 2016 and 2022. Patients were grouped into 4 treatment categories: intramedullary limb lengthening (IMN), extramedullary limb lengthening (EMLL), Ex-Fix limb lengthening, and Ex-Fix deformity correction. Percent weight change from baseline was modelled over postoperative days 0–84 using linear mixed-effects regression with quadratic time terms, adjusted for age and sex. Secondary analyses compared bone healing index (BHI) or external fixator index (EFI) between patients with versus without early weight loss
Results: 175 patients contributed 1066 weight observations. The IMN group showed the clearest early weight decline, reaching a nadir at day 44.7 at ~2% below baseline. By day 30, adjusted mean weight change was −1.7% in the IMN group versus +1.2% in the Ex-Fix deformity group (difference −2.85 pp; $p<0.001$). Net weight loss during the first 12 weeks occurred in 62.7% of IMN, 46.2% of EMLL, and 26.1% of Ex-Fix lengthening patients. Across all lengthening cohorts, patients with early weight loss had higher healing-index values: IMN BHI 37.64 vs 35.86 days/cm; EMLL BHI 34.61 vs 28.76 days/cm; ExFix EFI 50.50 vs 49.06 days/cm
Interpretation / Conclusion: Construct-specific postoperative weight trajectories reveal a measurable systemic response to limb reconstruction, with IMN lengthening showing the most distinct early weight-loss profile. The directional association between early weight loss and higher BHI/EFI across all lengthening cohorts suggests that longitudinal weight tracking may offer clinically useful insight into recovery. This supports the integration of perioperative metabolic optimisation in contemporary reconstruction care.

291. The RECONS Study: An International Multi-Stage Delphi Consensus Study To Develop A Core Outcome Set For Lower-Limb Lengthening Surgery

Ali Yalcinkaya[1], Ole Rahbek[1,2], Lili Worre Høpfner Jensen[1], Pernille Damborg Clasen[1], Christopher Iobst[3], Michael Skovdal Rathleff[4], Søren Kold[1], On Behalf Of The RECONS Study Collaborators[5]
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Background: Outcome reporting in lower-limb lengthening surgery is highly heterogeneous, limiting evidence synthesis and comparability. A prior RECONS scoping review identified 2,939 verbatim outcomes across 110 domains, illustrating the scale of this problem. No international multi-stakeholder core outcome set had been established.
Aim: To develop a stakeholder-informed core outcome domain set for lower-limb lengthening surgery through an international multi-stage modified Delphi consensus process involving patients, caregivers, and healthcare professionals.
Materials and Methods: Conducted per COMET/COS-STAD guidance, reported per COS-STAR. Outcomes were refined at an HCP meeting (EORS 2024; n=18, 7 countries) and reviewed by patients, children/adolescents, and caregivers. Twenty-seven domains entered a two-round Delphi survey with patients/caregivers (P/C) and HCPs. Consensus-in: ≥70% scoring 7–9 and <15% scoring 1–3 in both groups; HCP-only: ≥90% among HCPs. A post-Delphi meeting confirmed the provisional set.
Results: Round 1: 293 P/C and 80 HCPs from 28 and 20 countries. Round 2: 204 P/C and 71 HCPs (retention 71%/89%). After Round 1, 13 domains achieved consensus-in in both groups, 3 HCP-only, and 11 advanced to Round 2. A cosmetic satisfaction domain was added. After Round 2, two further achieved consensus-in, three consensus-out, seven remained unresolved. Provisional RECONS set: 15 domains spanning life impact (satisfaction with outcome, psychological well-being, quality of life), participation (work/education, social functioning), function (lower limb function, self-care), biological/technical effectiveness (lengthening achieved, bone healing, weight bearing, range of motion, muscle strength, alignment), treatment burden (external fixation time), and satisfaction (cosmetic result); plus 3 HCP-priority domains (complications, pain, deep infection).
Interpretation / Conclusion: This international consensus process produced a stakeholder-informed core outcome domain set for lower-limb lengthening surgery, engaging over 370 participants from 28 countries. Findings will inform RECONS 2.0, to be finalised in Stellenbosch, South Africa (December 2026), incorporating domain definitions, timing windows, and qualitative findings.

292. Nailing the Risk? Avascular Necrosis and Antegrade Rigid Nailing in Pediatric Femoral Shaft Fractures: A Scoping Review

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Background: Antegrade rigid intramedullary nailing (ARIN) is an established treatment for femoral shaft fractures in children aged 10 years to skeletal maturity. However, it carries a risk of femoral head avascular necrosis (AVN), particularly when using a piriformis fossa (PF) entry point.
Aim: This scoping review evaluates reported cases of AVN associated with PF and alternative entry points, including the tip of the greater trochanter (TGT) and the lateral greater trochanter (LGT), in paediatric ARIN.
Materials and Methods: The review was conducted in accordance with PRISMA-ScR guidelines using a registered protocol. A comprehensive search of PubMed, Embase, Cochrane Library, Web of Science, and Scopus was performed to identify studies reporting AVN in skeletally immature patients treated with ARIN. Two independent reviewers screened titles, abstracts, and full texts, with disagreements resolved by consensus. Data were extracted using a standardized form, including study characteristics, patient demographics, surgical details, entry point, follow-up duration, and AVN outcomes (diagnosis method, timing, and clinical features).
Results: A total of 44 studies comprising 1,398 children were included, predominantly retrospective in design. Entry points were PF (13 studies, n = 200), TGT (17 studies, n = 732), and LGT (18 studies, n = 446). Patient age ranged from 4 to 18 years and body weight from 20 to 106 kg. Mean follow-up ranged from 8.4 to 192 months. AVN occurred in 11 cases with PF entry, 1 case with TGT entry, and none with LGT entry. Nail removal was routinely performed. Methods of AVN detection varied and included radiographs, CT, and MRI.
Interpretation / Conclusion: The LGT appears to be the safest entry point for ARIN in skeletally immature patients, with no reported cases of AVN in the available literature. This is the most comprehensive review to date examining AVN following ARIN in paediatric femoral shaft fractures. The findings highlight the urgent need for standardized AVN assessment and long-term follow-up to better inform surgical decision-making

293. Correlation between missing ultrasound values and risk of residual acetabular dysplasia of the hip: A population-based study using natural language processing on ultrasound and radiology reports

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Background: Developmental dysplasia of the hip (DDH) is among the most common musculoskeletal conditions in infancy. The Pavlik harness achieves normalization of clinical and ultrasound findings in most infants – however, radiological evidence of residual acetabular dysplasia (RAD) has been reported in a considerable proportion of children despite successful early treatment. While often asymptomatic in early childhood, persistent dysplasia is associated with premature osteoarthritis, and may need surgical correction. Advances in datamining and natural language processing (NLP) provide new ways to analyze both structured ultrasound parameters and unstructured clinical text, providing opportunity to apply these models to large cohorts.
Aim: Assessing the correlation between missing ultrasound values in children and multifactorial target outcome to evaluate the risk of RAD in children.
Materials and Methods: Population based study of all children born in the Central Denmark Region from 2012 to 2025 who received an index hip ultrasound within the first six months of life (n = 7922). Data was extracted using an NLP model from the electronic patient system (EPJ) from pediatric, orthopedic, and obstetric departments. Ultrasound parameters include alpha angles, caput coverage, and pubofemoral distance. A logistic regression was used on missing ultrasound parameters (adjusting for sex, breech, gestational age and age at ultrasound) to calculate odd ratios for target based on these parameters.
Results: We identified 7922 children, of which 461 were missing one or more ultrasound parameters. When adjusting for sex, breech, gestational age and age at ultrasound, the odds ratio of having target=1 was 2,97 [95%CI = 2,07 ; 4,22]. Target is used as a proxy for RAD.
Interpretation / Conclusion: The analysis shows that if a child is missing at least one ultrasound variable, the odds of target are approx. 3 times higher, than if all ultrasound variables are present, when adjusting for sex, breech, gestational age, and age at ultrasound. Missing ultrasound parameters may be caused by complete luxation of the hip, atypical cases, etc., which are predictors of RAD.

294. Long-term outcomes of surgical intervention versus active monitoring for residual acetabular dysplasia in early childhood: a systematic review

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Background: Residual acetabular dysplasia (RAD) at skeletal maturity is associated with long-term complications, including early osteoarthritis and increased risk of total hip arthroplasty. Evidence on long-term outcomes of early childhood management strategies, including pelvic and/or femoral osteotomies versus active monitoring, remains limited.

Aim: This systematic review aimed to evaluate long-term radiological outcomes and health-related quality of life (HRQoL) at skeletal maturity following surgical management (pelvic and/or femoral osteotomies) for RAD in early childhood, and to assess the availability of comparative evidence with active monitoring.

Materials and Methods: A systematic review and narrative synthesis of quantitative studies was performed in accordance with PRISMA-guidelines and registered in PROSPERO (CRD420251029191). Multiple databases were searched for studies reporting RAD (center-edge angle, Severin classification) and/or HRQoL at skeletal maturity. Methodological quality was assessed using the Downs & Black checklist. Certainty of evidence was assessed using the GRADE-framework.

Results: Out of 2,057 unique studies, 20 met the inclusion criteria, published between 1982 and 2025. All were observational cohort studies; five were rated as good quality and fifteen as fair quality. RAD was present in 209/1,398 (15%) skeletally mature hips treated with pelvic and/or femoral osteotomies in early childhood (median follow-up age of 20 years, range 12–51). Good HRQoL outcomes were reported in 339/452 (75%) operated hips. GRADE assessment indicated very low certainty of evidence due to observational design, heterogeneity, and indirectness. No studies reporting long-term radiological or HRQoL outcomes of active monitoring were identified.

Interpretation / Conclusion: The majority of hips treated surgically for RAD in early childhood showed no RAD at skeletal maturity. However, there is a complete lack of comparative long-term evidence regarding active monitoring strategies. This represents a significant evidence gap, limiting conclusions on optimal treatment selection in early childhood DDH. Further research is needed to determine in which patients active monitoring may be an appropriate treatment option.

295. High Prevalence of Preoperative Hypovitaminosis D in Pediatric Limb Lengthening: Association with Regenerate Healing in Internal Lengthening Nail Surgery

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Background: Vitamin D is a key regulator of bone metabolism, influencing calcium homeostasis, osteoblastic activity, and mineralization. Distraction osteogenesis imposes substantial metabolic demands on regenerate bone formation. Although vitamin D deficiency is prevalent in adult limb reconstruction patients, data in the pediatric population remain limited.
Aim: To determine the prevalence of preoperative vitamin D deficiency in children undergoing limb lengthening with an internal lengthening nail, and to evaluate whether preoperative vitamin D status is associated with regenerate bone healing or postoperative complications.
Materials and Methods: Retrospective cohort study of 75 pediatric patients treated between 2017 and 2021 with lower-limb lengthening using an internal lengthening nail. Preoperative serum vitamin D was categorised as deficient (<20 ng/mL), insufficient (20–29 ng/mL), or sufficient (≥30 ng/mL). Primary outcome was the Bone Healing Index (BHI). Group comparisons used Kruskal– Wallis and chi-squared/Fisher's exact tests; multivariable linear regression identified independent predictors of BHI.
Results: 69.3% of patients had suboptimal preoperative vitamin D levels (deficient 29.3%, insufficient 40.0%, sufficient 30.7%). Median BHI did not differ across groups (40.09 vs 39.17 vs 38.00 days/cm; p=0.747). Complication rates were 13.6%, 6.7%, and 8.7% respectively (p=0.791). Vitamin D level was not correlated with BHI (Pearson r=−0.030, p=0.801) and was not an independent predictor in multivariable regression (β=0.027 days/cm per ng/mL; p=0.838). Increasing age was independently associated with slower regenerate healing (β=1.299 days/cm per year; p=0.012).
Interpretation / Conclusion: Preoperative vitamin D deficiency was highly prevalent yet was not independently associated with regenerate maturation or complication risk. Regenerate healing during distraction osteogenesis is likely governed by a multifactorial interplay of biological, mechanical, and metabolic factors. Vitamin D optimisation remains important for overall skeletal health, but supplementation alone may not accelerate bone formation. Prospective studies with standardised protocols are warranted.

296. Spasticity of the hip measured by Modified Ashworth Score is associated with development of a hip at risk for displacement.

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Background: Hip displacement is a common complication in non-ambulant children with cerebral palsy. Although spasticity has long been considered a contributing factor, the role of clinically assessed spasticity in specific hip muscle groups remains unclear.
Aim: Hip migration is a common complication in children with cerebral palsy (CP). Although spasticity has long been considered a contributing factor, muscle-specific associations with hip migration remain unclear. We investigated whether clinically assessed hip spasticity was associated with hip displacement risk in non-ambulant children with CP.
Materials and Methods: In this population-based cohort study using Danish Cerebral Palsy Follow-Up Program (CPOP) data, children classified as Gross Motor Function Classification System (GMFCS) levels IV–V with at least one hip radiograph were included. Hip migration was defined as migration percentage (MP) ≥30%. Spasticity was assessed using the Modified Ashworth Scale (MAS) for hip adductors, flexors, and extensors. Overall hip spasticity was defined as summed MAS (0, 1–3, 4–6, 7–9). Cumulative incidence was estimated with death as a competing event, and associations were evaluated using Fine–Gray regression adjusted for GMFCS level.
Results: A total of 422 children (786 hips) were included; 374 hips (47.6%) reached MP ≥30%, and death occurred as a competing event in 25 hips. Higher overall hip spasticity was associated with increased risk of hip migration, with subdistribution hazard ratios of 1.46 (CI 1.05–2.01), 1.77 (CI 1.22–2.58), and 2.53 (CI 1.59–4.02) for MAS 1–3, 4–6, and 7–9, respectively, compared with MAS 0. Adductor spasticity showed the most consistent association.
Interpretation / Conclusion: In children with CP classified as GMFCS levels IV– V, higher clinically assessed hip spasticity— particularly of the hip adductors—was associated with development of a hip at risk for displacement.

297. Reintervention after closed reduction of paediatric forearm fractures under general anaesthesia versus procedural sedation. A systematic review.

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Background: Fracture reduction of paediatric forearm fractures is often obtained by closed reduction (CR). Recent guidelines recommend early CR under procedural sedation (PS), avoiding admission and general anaesthesia (GA), but it remains uncertain whether outcomes following PS are comparable with those achieved with GA.

Aim: We aimed to compare PS with GA in terms of reintervention rates, complications, and patient/parent satisfaction in children undergoing CR for forearm fractures.

Materials and Methods: This systematic review adhered to PRISMA guidelines and was registered in PROSPERO. We searched Embase, MEDLINE, Scopus and CENTRAL from inception to December 2025 for studies of children aged 1-16 years treated with CR for a forearm fracture. The intervention of interest was CR performed under PS compared with GA. Both randomised and non-randomised comparable studies were eligible. Two raters independently screened all records. Methodological quality was assessed by one rater and cross-checked by a second rater, using the SIGN checklist. The primary outcome was the rate of reintervention.

Results: Seven studies (n=1,223) were included with no randomised studies identified. Considerable clinical heterogeneity precluded statistical comparison, and only three studies had acceptable methodological quality. Treatment allocation was based on the fracture characteristics and patient factors. Overall reintervention rates were 13% for PS and 10% for GA. Three studies (n=755) reported loss of reduction not requiring a reintervention: 2% in the PS and 7% in the GA group. Two studies addressed complications related to the anaesthetic or sedative procedure, reporting a rate of 15% in PS and 13% in GA. None of the studies provided any scores to describe patient or parent satisfaction.

Interpretation / Conclusion: Clinical heterogeneity and the limited methodological quality of available studies precluded statistical comparison. Consequently, the comparative effectiveness of PS versus GA regarding reintervention, complications, and patient/parent satisfaction remains uncertain. PS was for a selected group depending on fracture and patient.

298. Crossing the Growth Plate: Distal Femoral Physeal Response to Intramedullary Nailing in a Porcine Model

Maria Tirta[1], Shima Gholinezhad[1], Ole Rahbek[1,2], Ahmed Halloum[1], Jan Duedal Rölfing[2], Jacob Schade Engbjerg[2], John Rasmussen[3], Jeppe Byskov[4], Søren Kold[1]
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Background: Intramedullary nailing (IMN) is widely used for femoral stabilization, but its safety in skeletally immature patients remains debated due to concerns about growth plate injury. Evidence suggests that limited central physeal violation may be tolerated, yet detailed three-dimensional (3D) assessments of growth, volume, and alignment,and the influence of implant material are lacking.
Aim: To evaluate the effects of retrograde intramedullary nailing across the distal femoral physis on femoral growth, distal femoral volume, and alignment in a juvenile porcine model, and to compare outcomes between titanium and stainless-steel implants.
Materials and Methods: Nineteen juvenile pigs underwent unilateral retrograde femoral nailing with either titanium or stainless-steel nails; the contralateral femur served as an internal control. Follow-up was short term or long term. Growth and alignment were assessed using two-dimensional computed tomography (CT)–based measurements and a 3D surface registration framework quantifying relative femoral length change, distal femoral volume change, and angular deviations in coronal, sagittal, and transverse planes.
Results: Across all animals operated, femora showed small reductions in relative longitudinal growth and distal femoral volume compared with contralateral controls. In pooled analyses, the mean paired difference was −1.05% for femoral length (95%CI: −1.80, −0.30) and −5.28% for distal femoral volume (95%CI: −7.50, −3.10), corresponding to 1% and 5% reductions, respectively. Overall trends were similar for titanium and stainless-steel implants; however, stainless-steel nails showed a slightly greater distal femoral volume reduction at long-term follow-up. Angular changes were small and variable in direction, with no systematic alignment pattern observed
Interpretation / Conclusion: Overall, limited central violation up to 6% of the distal femoral physis in this porcine model was associated with small reductions in femoral length and distal volume, without evidence of meaningful angular malalignment.

299. Pediatric Orthopaedic Trauma During The 2022 FIFA World Cup In Qatar: Informing Resource Planning For The 2026 FIFA World Cup

Ali Yalcinkaya[1,2], Mubashir Wani[2,3], Adil Abbas Ali[3], Jishar Sainulabdeen[3], Ali Alabbas[3], Mohammed Ebrahem[3], Ahmed Hicazi[3], Farhan Ali[3], Abdelsalam Hegazy[3]

1. Interdisciplinary Orthopaedics, Department of Orthopaedic Surgery, Aalborg University Hospital, Aalborg, Denmark; 2. Department of Orthopedic Surgery, Center for Limb Lengthening and Reconstruction, Nationwide Children's Hospital, Columbus, OH, United States; 3. Department of Surgery, Division of Orthopedic Surgery, Sidra Medicine, Doha, Qatar.

Background: Major sporting events are commonly assumed to increase trauma-related healthcare demand, prompting hospitals to expand staffing and operating-room capacity. Pediatric orthopaedic trauma has distinct injury mechanisms and resource implications, yet subspecialty-specific evidence from mass-gathering events remains sparse.

Aim: To evaluate whether the FIFA World Cup 2022 altered pediatric orthopaedic injury volume, injury characteristics, or operative burden at the sole tertiary pediatric orthopaedic trauma centre in Qatar, thereby informing resource planning for the 2026 FIFA World Cup.

Materials and Methods: Prospective observational study at Sidra Medicine, Qatar's sole pediatric orthopaedic trauma referral centre, providing near-complete national case capture. All children aged 0–14 years presenting with orthopaedic injuries from Nov 1 to Dec 31, 2022 were included. Tournament (Nov 20–Dec 18) and non-tournament periods were compared. Daily visit counts were analysed using negative binomial regression adjusted for weekend patterns. Additional analyses examined match-day effects, interrupted time-series changes, and management patterns.

Results: 219 pediatric orthopaedic emergency visits were included: 100 (45.7%) during the tournament and 119 (54.3%) outside it. Median age was 8 years; 69.0% were male; 80.8% had upper extremity injuries; 90.9% were low-energy. Tournament exposure was not associated with higher daily visit volume (IRR 0.90, 95% CI 0.64–1.27), increased football-related injury odds (OR 0.50, 95% CI 0.21–1.20), or shifts in management category. Match days were associated with fewer presentations than non-match days (IRR 0.69, 95% CI 0.50–0.95). Interrupted time-series analyses showed no meaningful change at tournament start or end.

Interpretation / Conclusion: The FIFA World Cup 2022 did not generate a pediatric orthopaedic trauma surge or increase operative burden. Match days were associated with fewer presentations, suggesting behavioral adaptation during major football events. These findings challenge routine surge-planning assumptions and support a targeted, evidence-based approach to pediatric orthopaedic staffing and operating-room allocation for the 2026 FIFA World Cup and future mass-gathering events.

POSTER WALK 11: PEDIATRICS 2

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Ahmed Halloum

Katrine Rønn Abildgaard

Posters 300–307, 388

300. Does K-wire divergence angle mean anything for the stability of fracture fixation in children operated for supracondylar fractures of the humerus?

Jelena Gunatheeswaran[1,2], Bjarne Møller-Madsen [1,2]
1. Department of Orthopaedics, Aarhus University Hospital, Denmark; 2. Aarhus University, Aarhus, Denmark

Background: Percutaneous pin fixation is the standard surgical treatment for displaced pediatric supracondylar humerus fractures. While pin configuration has been extensively studied, the clinical relevance of pin divergence angle remains unclear. However, biomechanical evidence suggest that increased divergence may improve fixation stability.
Aim: To evaluate the association between pin divergence angle and postoperative maintenance of fracture malignment in pediatric supracondylar humerus fractures treated with closed reduction and percutaneous pinning.
Materials and Methods: This retrospective observational study included children treated surgically for supracondylar humerus fractures at Aarhus University Hospital (AUH) between 2020 and 2025. Radiographic measurements included Baumann's angle and the lateral capitellohumeral angle obtained from immediate postoperative and follow-up radiographs. Changes in alignment were calculated, and pin divergence angle was measured on postoperative radiographs. Associations between divergence angle and radiographic outcomes were assessed using Pearson's correlation. Clinical outcomes were analysed descriptively.
Results: Ninety patients were included. Median changes in both coronal and sagittal alignment were small at follow-up. Pin divergence angle varied widely across the cohort, but no significant associations were observed between divergence angle and changes in radiographic alignment. Stratification by divergence angle categories showed overlapping alignment changes. Clinical adverse events were infrequent, and no clear differences in outcomes were observed across divergence groups.
Interpretation / Conclusion: Pin divergence angle was not associated with improved radiographic alignment or clinical outcomes. These findings suggest that once adequate fixation is achieved, increasing pin divergence may not provide additional clinical benefit.

301. Complications after continuous epidural catheters in paediatric patients undergoing major orthopaedic surgery

Malene Fjordside Jensen[1,2], Marianne Frydendal Nielsen[1,2], Jan Duedal Rölfing[1,2], Bjarne Møller-Madsen[1,2]
1. Department of Orthopaedics, Aarhus University Hospital, Denmark; 2. Danish Paediatric Orthopaedic Research, Department of Children's Orthopaedics, Aarhus University Hospital, Denmark

Background: Continuous epidural analgesia (CEA) is widely used in children for postoperative pain control after major orthopaedic procedures, but the treatment is not without adverse events.
Aim: This study aimed to evaluate the effect and complications related to the use of CEA as postoperative pain control in children following major orthopaedic surgery.
Materials and Methods: In this retrospective chart review, all children (6 months-17 year) who received CEA for pain control after elective orthopaedic surgery from 2019-2023 were included. A total of 286 patients were included, and subgroups were created according to surgical site: pelvis (n=42), femur (n=48), combined pelvis and femur (n=27), lower leg and foot (n=14), and spine (n=155). These surgeries predominantly represented femoral, pelvic, and lower-extremity osteotomies, as well as posterior spinal fusion for scoliosis. Patient medical records were reviewed, and data was collected in RedCap. Descriptive statistics were calculated, and characteristics were compared.
Results: Results were categorized by underlying cause: equipment-related (25.9%), procedure-related (15%), and drug-related (33.6%) events. Common examples included catheter leakage, breakage, and occlusion (equipment-related), wet tap/dural puncture (procedure-related), and hypotension (drug-related). Major complications as defined by the ISO-definition, occurred in 4.9% of patients, most frequently involving respiratory complications. Of these, 71.4% occured in the spine group, which also demonstrated the highest overall rate of complications (67.1%), while the lowest rate was seen in the lower leg and foot group (28.6%). Epidural analgesia provided effective pain control: 50% of the patient-recorded descriptions indicated "no/mild pain", the mean revised face, legs, activity, cry, consolability ((r)-FLACC) pain score was 2.1, and the mean numeric rang scale (NRS) score was 4.4.
Interpretation / Conclusion: 4.9% of patients experienced events classified as major complications, primarily occurring in the spine group. The remaining complications were transient and of minor clinically relevance. CEA provides effective pain control in children undergoing major orthopaedic surgery.

302. Patient Reported Outcome Measures after Tibialis Posterior Tendon Transfer in Children with Spastic Varus Foot and Cerebral Palsy: A 10-Year Follow-up

Marianne Frydendal Nielsen[1,2], Prajahi Ketheeswaran Kumarasamy [1,2], Polina Martinkevich [1,2], Jan Duedal Rölfing [1,2], Bjarne Møller-Madsen [1,2]
1. Department of Children's Orthopaedics and Reconstruction, Aarhus University Hospital, Denmark 2. Danish Paediatric Orthopaedic Research (DPOR), Aarhus University Hospital, Denmark

Background: Cerebral Palsy (CP) is a motor function disorder caused by damage or abnormal development in the parts of the brain controlling movement and posture. This includes spastic varus foot deformity caused by an overactivation of the tibialis posterior muscle or weakening of the peroneal muscles. This condition may cause several daily life obstructions. The dynamic characteristics make it difficult to treat. One treatment option is tibialis posterior tendon transfer (TPT).
Aim: This study aimed to assess patient reported outcome measures (PROMs) and investigate quality of life in children with CP treated with TPT for spastic varus foot. We hypothesized that TPT is a valuable treatment option in this patient group.
Materials and Methods: The study was conducted as a single centre retrospective case series. We included all CP patients with varus foot who underwent TPT surgery at the Department of Children's Orthopaedics at Aarhus University Hospital in 2012-2022. Questionaries were answered by the patients or their primary caregivers. PROMs were collected using the validated Danish translation of The Oxford Ankle and Foot Questionnaire for Children (OxAFQ-C). OxAFQ-C investigates four domains: Physical; School and Play; Emotional; Footwear. Responses are graded on a 5-point Likert scale.
Results: 19 patients with a total of 26 operated feet evaluated the PROMs. The mean follow-up was 2.6 years ±2.1. OxAFQ-C results showed that the patients were most satisfied regarding School and Play. The majority answered "Never" in three out of four questions in this domain. The patients were least satisfied concerning some aspects of physical activity, answering that they were "Often" or "Always" hindered when running or standing for a longer period of time.
Interpretation / Conclusion: In view of patient satisfaction, the study indicated that TPT can be valuable in children with spastic varus foot due to CP. Studies on PROMs after TPT or alternative surgical treatment options for spastic varus foot in CP are still scarce. This study suggested considering TPT as a simple soft tissue procedure in this patient group. TPT might enhance functionality and quality of life.

303. Divergent Elbow Dislocation in a 7-Year-Old Girl: A Case Report and Structured Literature Review of a Rare Pediatric Injury Pattern

Casper Grønbæk[1], Peter Max Halschou-Jensen[1], Morten Jon Andersen[1,2]
1. Department of Orthopedic Surgery, Copenhagen University Hospital - Herlev and Gentofte; 2. Department of Clinical Medicine, University of Copenhagen

Background: Divergent elbow dislocation is an exceptionally rare pediatric injury where the distal humerus is forced between the proximal radius and ulna, causing them to separate. This injury represents a tiny subset of pediatric elbow dislocations, which themselves comprise only 3–6% of pediatric elbow trauma. Diagnosis is frequently challenging because radiographic findings are often misinterpreted as Monteggia fracture-dislocations or "terrible triad" injuries.
Aim: This study aims to report a clinical case of divergent elbow dislocation in a 7-year-old girl and synthesize current evidence through a structured literature review to improve diagnostic accuracy and management.
Materials and Methods: Case: A 7-year-old female presented to Herlev Hospital, following a fall on roller skates. Clinical evaluation, radiographic imaging, and surgical records were analyzed. Review: A comprehensive search across research papers was conducted. We found only 20 papers specifically addressing pediatric divergent dislocations.
Results: In the reported case, the patient presented with an elbow deformity. Initial imaging was suggestive of a fracture-dislocation involving the coronoid process, mirroring the literature's tendency to mistake these injuries for Monteggia or "terrible triad" patterns. She underwent successful closed reduction under general anesthesia supplemented by an arthrogram followed by three weeks of immobilization. The literature review identifies fewer than 30 reported pediatric cases over several decades, confirming the injury's rarity. The most common mechanism is a fall on an outstretched hand with axial loading. While closed reduction is successful in most cases, misdiagnosis can lead to delayed or wrong treatment. When managed promptly, most children achieve excellent functional outcomes and full range of motion.
Interpretation / Conclusion: Divergent elbow dislocations require a high index of clinical suspicion and sometimes advanced imaging to ensure accurate diagnosis. Early closed reduction typically results in favorable outcomes. However, a significant research gap remains regarding standardized imaging protocols and long-term functional data into adulthood.

304. High Incidence of Apophyseal Tenderness in Young Team Gymnasts with Prolonged Lower-Extremity Overuse Injuries: A Prospective Clinical Examination Study involving 519 Gymnasts

Charlotte Anker-Petersen[1], Carsten Bogh Juhl[2,3], Mikkel Bek Clausen[4], Birgit Juul-Kristensen[2], Per Hölmich[1], Kristian Thorborg[1]

1. Sports Orthopedic Research Center-Copenhagen, Department of Orthopedic Surgery, Amager-Hvidovre Hospital, Copenhagen University Hospital, Denmark 2. Department of Sports Science and Clinical Biomechanics, Research Unit for Musculoskeletal Function and Physiotherapy, University of Southern Denmark, Odense, Denmark 3. Department of Physiotherapy and Occupational Therapy, University Hospital of Copenhagen, Herlev and Gentofte, Copenhagen, Denmark 4. Department of Midwifery, Physiotherapy, Occupational Therapy and Psychomotor Therapy, Faculty of Health, University College Copenhagen, Copenhagen, Denmark

Background: A high rate of prolonged lower extremity injuries poses a significant challenge, but knowledge of specific diagnoses is lacking.
Aim: This study aimed to describe clinical examination findings in Team Gymnasts aged 10-30 years with prolonged lower extremity overuse injuries, including specific examinations for apophyseal tenderness.
Materials and Methods: In total, 519 gymnasts were prospectively monitored through weekly text messages regarding injury status, training, and competition exposure during the 2021-2022 season, which lasted 10-months. Gymnasts with prolonged lower-extremity overuse injuries (injury lasting ≥3 consecutive weeks) were invited to undergo clinical examination based upon a prespecified examination protocol.
Results: Among 519 gymnasts, 174 (33.5%; mean age 14.4 years) sustained 306 prolonged overuse injuries. These injuries affected 49 of 149 male gymnasts (32.9%) and 125 of 370 female gymnasts (33.8%). The clinical examination completion rate was 94.8%. The prolonged overuse injuries yielded 450 clinical findings, of which 165 (36.7%) involved apophyseal tenderness. The cumulative incidence of apophyseal tender spots was 20.6% (95% CI 16.6–25.0) among gymnasts aged ≤15 years and 7.1% (95% CI 3.4–12.7) among those aged 16–30 years. Apophyseal tenderness most frequently involved the knee (66.1%), followed by the hip/pelvis (23.6%) and the foot/ankle (10.3%). Among other diagnoses, patellofemoral pain syndrome (15.1%), medial tibial stress syndrome (11.2%), and anterior ankle impingement (10.2%) were most common, corresponding to 36.5% of all other prolonged overuse injuries.
Interpretation / Conclusion: In conclusion, apophyseal tenderness was highly prevalent among young Team Gymnasts with prolonged lower-extremity overuse injuries, most commonly affecting the knee. Other frequent clinical diagnoses in this cohort included patellofemoral pain syndrome, medial tibial stress syndrome, and anterior ankle impingement.

305. Significant Growth Disturbances Following ACL Reconstruction in Very Young Children

Martin W. Rathcke[1], Rasmus K. Mikkelsen[1], Torsten Warming[1], Philip Hansen[3], Kristoffer W. Barfod[1]
1. Section of Sportstraumatology, Department of Orthopaedics, Copenhagen University Hospital Bispebjerg, Denmark; 2. Institute for Sportsmedicine, University of Copenhagen, Bispebjerg, Denmark; 3. Department of Radiology, Copenhagen University Hospital, Bispebjerg, Denmark.

Background: Growth disturbances are a major concern following anterior cruciate ligament reconstruction (ACLR) in skeletally immature children. Pediatric ACLR techniques aim to spare the physes and minimize deformities. Although previous studies report mostly minor growth disturbances, evidence is limited in very young children with high growth potential.
Aim: To evaluate radiographic growth disturbances after pediatric ACLR in children under 12 years of age.
Materials and Methods: The Danish Health Authority defines pediatric ACL reconstruction as surgery in children under 16, restricted to two public clinics in Denmark. Between 2011 and 2021, 169 pediatric ACL reconstructions were performed at our institution and followed prospectively until skeletal maturity, including radiographic evaluation. Fourteen children were < 12 years at surgery; seven (50%) had postoperative long-leg radiographs available. Measurements included LDFA (lateral distal femoral angle), MPTA (mechanical proximal tibial angle), MAD (mechanical axis deviation), and LLD (leg length discrepancy), which were compared with the contralateral side. Significant growth disturbance was defined as side-to side difference of LDFA or MPTA >3°, MAD >15 mm, or LLD >10 mm.
Results: In the <12 group (n=7), all had at least one significant growth disturbance. Mean differences were: LDFA 5.4° (3–8), MPTA 1° (0–2), MAD 15 mm (8–22), LLD 13 mm (10– 17). Six patients (86%) showed abnormal LDFA, three (43%) had MAD >15 mm, and six (86%) had LLD >10 mm.
Interpretation / Conclusion: Clinically significant growth disturbances were common after ACLR in children <12 years, despite pediatric-specific techniques. The main abnormalities involved valgus deformity (LDFA), axis deviation (MAD), and leg length discrepancy (LLD), indicating the femoral physis as the most vulnerable site.

306. Specific pathologies for anterior knee pain are rarely ruled out in patients with chronic anterior knee pain syndrome.

Bertram L. Kierkegaard[1], Anna N. Rasmussen[1], Michael R. Krogsgaard[1,2,3]
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Background: Chronic Anterior knee pain syndrome (AKPS), commonly referred to as patellofemoral pain, is a common condition without any generally agreed on definition. There are several conditions that can explain anterior knee pain e.g. fat pat impingement, trochlear dysplasia, or cartilage pathology and for some of these there are specific treatments available. We hypothesize that such conditions are not generally identified, introducing sampling bias and potentially affecting reported treatment outcomes.
Aim: To identify diagnostic criteria for study populations in randomized treatment trials of AKPS and evaluate to which extent potentially treatable conditions are ruled out.
Materials and Methods: A systematic search of PubMed, MEDLINE, Scopus, and Cochrane was conducted to identify RCTs investigating treatments for AKPS. Articles were screened independently by two reviewers. Studies were excluded if a minimum pain duration of 3 months was not part of the inclusion criteria. Data on diagnostic criteria and use of imaging were extracted.
Results: A total of 66 studies involving 3,138 patients were included. Imaging was used in 15 studies, while only 5 studies (n = 310 patients) used MRI as well as x-rays consequently as part of the diagnostic definition to exclude specific pathologies. Furthermore, existing clinical tests, often recommended for diagnosing AKPS, were used infrequently: Patellar compression test in 12 studies, patellofemoral grinding test in 10, and Clarkes test in only 4 studies.
Interpretation / Conclusion: Potentially treatable pathologies that are unlikely to respond to non-surgical treatments are rarely excluded in RCTs on treatment of AKPS. Future studies should consider standardized diagnostic criteria including imaging.

307. Uncovering the Aetiology and Pathogenesis of Apophysitis (APO-PATO): Study Protocol for an Exploratory Prospective Cohort Study in 8-15-year-old Students from a Sports School with a High-Risk of Developing Knee Apophysitis

Malthe Roswall[1,3], Lasse Ishøi[1,5], Jasmin Bagge[1], Anna Bugge[7], Jesper Bencke[1,6], Jens Lykkegaard Olesen[4], Thor Einar Andersen[8,9], Tobias Hoffmann Degnebolig[1,7], Eyðleyg Súnadóttir[1,7], Rasmus Lindegaard Smidt[1,7], Fredrik Leander Mørkeberg[1,7], Anne Nedergaard[1], Per Hölmich[1,2], Kasper Krommes[1]

1. Sports Orthopedic Research Center – Copenhagen (SORC-C), Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Denmark; 2. Department of Clinical Medicine, University of Copenhagen, Denmark; 3. Copenhagen School and Sports Academy, Copenhagen, Denmark; 4. Center for General Practice at Aalborg University, Aalborg, Denmark; 5. Human Performance Department, F.C. Nordsjælland, Right to Dream, Denmark; 6. Human Movement Analysis Lab, Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Denmark; 7. Department of Midwifery, Physiotherapy, Occupational Therapy and Psychomotor Therapy, Faculty of Health, University College Copenhagen, Copenhagen, Denmark; 8. Oslo Sports Trauma Research Center, Department of Sports Medicine, Norwegian School of Sports Sciences, Oslo, Norway; 9. The Norwegian Football Association's Sports Medicine Center, Oslo, Norway

Background: Apophysitis is a common condition in children and adolescents, affecting tendon insertions during skeletal maturation. The most prevalent type, Osgood-Schlatter, affects up to 20% of sports-active children and adolescents, reducing sports participation and quality of life. Despite its high prevalence, prospective data on aetiology and pathogenic factors in early and pre-symptomatic stages is scarce

Aim: To explore how proposed aetiological factors change before, during, and after Osgood-Schlatter onset

Materials and Methods: APO-PATO is a 2-year exploratory prospective cohort study with frequent monitoring of ~120 children aged 8-15 years from a sports school with high sports participation (>5 weekly sessions). Recurrent assessments include daily self-reported measures of training load, sleep, knee pain, and measures of structural changes (sonography), knee extension strength, and countermovement jump kinematics and kinetics, nociplastic pain sensitivity, and hip- and knee flexibility. Quarterly assessments include measures of anthropometry and growth-velocity, hypermobility scoring, and urine-sampled biomarkers on tissue turnover, oxidative stress, inflammation, hormone levels. Baseline assessments include additional clinical assessments, parental history of apophysitis, further anthropometrics, and self-reported use of painkillers and willingness to compete hurt. Participants reporting with anterior knee pain are clinically assessed, and Osgood-Schlatter incident cases are defined as pain localized to the tibial tuberosity persisting for ≥4 weeks. Longitudinal analyses will examine time-varying exposures (e.g. training load, sleep, growth) and trajectories of outcomes relative to symptom onset (-12 to +12 weeks)

Results: pending.

Interpretation / Conclusion: This study will provide high-resolution longitudinal data on the trajectory from asymptomatic to symptomatic stage of Osgood-Schlatter and identify candidate aetiological mechanisms and risk factors thereby contributing to the translational stages T0 (basic research) and T1 (clinical application). Findings will inform and power future hypothesis-driven studies and contribute to improved prevention strategies and evidence-based management of growth-related knee pain

388. The use of porous titanium wedges in pediatric foot surgery; Osteo-Sinter® Evans wedges in children and adolescents undergoing lateral column lengthening for painful plano-valgus deformity.

Niels Ellitsgaard[1]
Department of Orthopaedics, Rigshospitalet, Copenhagen, Denmark

Background: Severe and symptomatic plano valgus foot deformity not suitable for arthroeiresis are treated by lateral column lengthening at the neck of the calcaneus or as a calcaneo-cuboidal fusion. In younger kids we use autograft from the iliac crest, which heals up without a noticeable defect. In adolescents a bony defect might persist in addition to the scar. One complication especially in osteopenic calcaneal bone is collapse around the graft thus losing the planned length of the lateral column.
Aim: Using solid porous titanium wedges avoids harvesting from the iliac crest. It comes in several sizes which fit at least three cortices of the osteotomy gap thus avoiding collapse of the adjacent bone around the allograft. The titanium wedges are used in adults. To our knowledge only one study has been published (JPO B 2026,, 35:134-141.) on the use in children.
Materials and Methods: 18 feet in 14 patients were operated using porous titanium wedges. Median age at surgery was 14 years (11-18). Seven patients had cerebral palsy: 4 GMFCS2 patients had 1 bilateral and 3 unilateral operations and other 3 patients GMFCS 3, 4 and 5 respectively were bilaterally operated. Two of the ambulate CP patient were formerly lengthened with iliac crest grafts. Other diagnoses included one congenital idiopathic drop foot, 5 subtalar coalitions and one skew foot. The Evans wedges were used for calcaneal lengthening osteotomies in 9 feet, calcaneocuboid fusions in 9 feet. Combined medial bony and soft tissue procedures were 2 supramalleolar osteotomies, 3 tuber calcanei medializations, 4 talonavicular fusions, 3 cotton wedges. Plasterimmobilisation 10 weeks, weightbearing after 4-5 weeks. Median follow up (clinical and xray) was 14 (2,5-36) months.
Results: All patients were pain-free with corrected hindfeet. No implant loosening, -collaps or revision. No infections. An impinging peroneus tertius tendon was resected.
Interpretation / Conclusion: Porous titanium wedges are reliable maintaining shape and length, they offer shorter surgical times (no iliac crest harvesting), they are well tolerated. Studies on graft ingrowth, especially in osteopenic bone, would be valuable for future recommendations regarding, postoperative early weight-bearing.

POSTER WALK 12: KNEE ARTHROPLASTY 1

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Tobias Dahl Vind

Claus Varnum

Posters 308–317

308. What is the clinical benefit of prescribing physical rehabilitation after total knee arthroplasty? A pooled analysis of a randomized controlled trial with a 12-month follow-up (DRAW1) and its replication trial (DRAW2)

Troels Mark-Christensen[1,2], Kristian Thorborg[3,4,5], Thomas Kallemose[2], Thomas Bandholm[2,4,5,6]
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Background: Comparative trials after total knee arthroplasty (TKA) show no consistent superiority of any rehabilitation format, raising a fundamental question about its effectiveness.
Aim: To assess the effectiveness of prescribing physical rehabilitation after TKA using stratified data pooled from two identical randomized trials.
Materials and Methods: e conducted a prespecified pooled analysis of patients with TKA from a pragmatic randomized controlled trial (DRAW1) and its identically conducted replication trial (DRAW2), each using a three-arm parallel-group superiority design with blinded outcome assessment. Patients undergoing primary unilateral TKA due to osteoarthritis were randomly assigned in a 1:1:1 ratio using computer-generated block randomization, to one of three groups: home-based telerehabilitation, home-based rehabilitation, or no prescribed physical rehabilitation for 6 weeks. The primary outcome was the Knee injury and Osteoarthritis Outcome Scores: Activities of Daily Living subscale (KOOS-ADL) assessed at 6 weeks. Analyses followed the intention-to-treat principle with multiple imputation for missing data.
Results: 428 patients following TKA were screened for eligibility from February 2019 to March 2024 before the sample size of 168 was reached. Comparing prescribing physical rehabilitation (home-based telerehabilitation and home-based rehabilitation) to not prescribing physical rehabilitation, the mean group-differences for the primary outcome were: 2.1 (95%CI: -0.4 to 4.5; p = 0.10) KOOS points at 6 weeks, and 1.0 (95%CI: -1.7 to 3.6; p = 0.49) and 1.4 (95%CI: -1.4 to 4.1; p = 0.33) points at the 3- and 12-months follow-ups, respectively. 18 adverse events occurred; five among those prescribed home-based telerehabilitation, six among those prescribed home-based rehabilitation group, and seven among those not prescribed to physical rehabilitation.
Interpretation / Conclusion: Prescribing physical rehabilitation after TKA did not offer clinical benefit, as it showed no statistical or clinically relevant superiority over not prescribing physical rehabilitation for self-reported ADL-function at any time.

309. Tibial Component Overhang and Coverage in Relation to Implant Migration: A CT and Model-Based RSA Study

Müjgan Yilmaz Altun[1,2,3], Gunnar Flivik [4], Mette Lønstrup Harving [6,7], Thomas Lind [2], Anders Odgaard [1,5], Albin Christtenson [4], Michael Mørk Petersen [1,5]

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Background: Postoperative pain remains a common complaint after total knee arthroplasty (TKA) and is considered multifactorial. Tibial component rotation, coverage, and overhang may contribute to this pain. An asymmetrical tibial component has been developed to improve anatomical fit, optimize coverage, and minimize overhang, potentially reducing persistent postoperative pain.
Aim: This study aimed to evaluate tibial component coverage and rotational alignment, and to assess whether component positioning influences migration.
Materials and Methods: A total of 111 patients (Denmark n=59, Sweden n=52) were included. Among the Danish patients, 29 received uncemented and 30 cemented tibial components, whereas all Swedish patients received cemented components. During a 2-year follow-up period, all patients underwent standardized bilateral CT scans of the hip, knee, and ankle joints. For each patient, four alignment-corrected measurement sequences were generated to optimize visualization of the tibial component. The study is part of two randomized controlled trials (NCT02656771 and NCT03494348).
Results: The mean tibial coverage was 86.4% (SD 5.7), with 87.2% (SD 5.2) for cemented and 85.3% (SD 6.9) for uncemented components. Most components were placed in external rotation (n=97; mean 4.6°, SD 3.2), whereas a small number were internally rotated (n=9; mean 3.6°, SD 1.9); the rest were neutral position. The greatest overhang was observed in the posteromedial region (n=84) (mean 60.6 mm²), which also exhibited the highest degree of under-coverage (mean 207.6 mm²).
Interpretation / Conclusion: Asymmetrical tibial components demonstrate high coverage and appropriate rotational alignment on CT, with excellent inter- and intraobserver reliability. Component positioning was not associated with increased migration as assessed by RSA.

310. Evaluating early recovery after knee arthroplasty: measurement properties of the Danish Oxford Arthroplasty Early Recovery Score and Early Change Score

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Background: The Oxford Arthroplasty Early Recovery Score (OARS) and Oxford Arthroplasty Early Change Score (OACS) assess early recovery after knee and hip arthroplasty. OARS measures current health status, including pain, function, sleep, and well-being, whereas OACS measures perceived change since surgery. Both instruments comprise 14 items, with total scores ranging from 0 to 100 (OARS) and −50 to 50 (OACS). In 2024, OARS and OACS were translated and culturally adapted into Danish.
Aim: To evaluate the measurement properties of the Danish OARS and OACS in patients undergoing knee arthroplasty.
Materials and Methods: We included 231 patients undergoing total or unicompartmental knee arthroplasty at a fast-track orthopaedic department. PROMs were collected at six time points from postoperative day (POD) 2 to POD 56. Construct validity of OARS was assessed at POD3 by hypothesis testing against the Quality of Recovery-15 and Knee injury and Osteoarthritis Outcome Score. Test–retest reliability and internal consistency were assessed in patients reporting “no or only minor, non-important change” on an anchor question between POD3 and POD7 (n=129).
Results: Overall completion rates were 83–94%. Correlations between OARS and the reference measures were moderate to strong (r=0.47–0.75), confirming 5/7 predefined hypotheses. Test–retest reliability Interclass correlation coefficient (ICC) was 0.72 (95% CI 0.63-0.80) for OARS and 0.66 (95% CI 0.56-0.76) for OACS. Internal consistency was high (Cronbach’s α 0.87 (OARS) and 0.92 (OACS)). Mean differences were 2.7 (95% CI 0.7-4.7) for OARS and 2.0 (95% CI 0.1-3.9) for OACS, with minimal detectable changes (MDC) of 22.6 (95% CI 20.1-25.7) and 21.5 (95% CI 19.1-24.5), respectively.
Interpretation / Conclusion: OARS demonstrated acceptable construct validity, and both instruments showed high internal consistency. Test–retest reliability was slightly below the conventional threshold for good reliability, and MDC values indicate that large changes are needed to exceed measurement error. These findings should be interpreted in the context of rapid postoperative health changes. Analyses of structural validity, responsiveness, and interpretability will be completed prior to the congress.

311. Postoperative physiotherapy treatments for patients undergoing manipulation under anesthesia due to postoperative knee stiffness following knee replacement: A scoping review

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Background: Knee stiffness is a known complication after a knee replacement. When physiotherapy alone is insufficient, manipulation under anesthesia (MUA) is often used. To optimize outcomes after MUA, patients are typically referred to postoperative physiotherapy, but the content and effectiveness of this physiotherapy are not well established.
Aim: To map and describe postoperative physiotherapy treatments provided to patients undergoing MUA due to postoperative knee stiffness following knee replacement.
Materials and Methods: A literature search was conducted on 21 August 2025 in following databases: MEDLINE (via PubMed), Embase, Cochrane Library (CENTRAL), CINAHL (via EBSCOhost) and PEDro. Two reviewers independently screened studies in Covidence according to predefined eligibility criteria (patients who had undergone MUA due to postoperative knee stiffness after knee replacement and subsequently received physiotherapy). Data from included studies were extracted to a predesigned Excel sheet.
Results: A total of 508 records were screened by title and abstract, and 29 full-text articles were assessed for eligibility. Nineteen studies met the inclusion criteria (two randomized controlled trials (RTC), two case reports, two cross-sectional studies, 11 cohort studies, one case-control study and one protocol). Only one study investigated the effect of postoperative physiotherapy after MUA, although all studies described physiotherapy treatments with varying levels of detail. The most frequently reported treatment was continued passive motion devices (14/19 studies), followed by passive and active range of motion techniques (7/19). Other physiotherapy modalities were manual mobilization techniques (4/19), bicycling (4/19), muscle strengthening (3/19) and gait training (2/19). Seven studies provided limited descriptions of physiotherapy and exercises.
Interpretation / Conclusion: This scoping review found that the evidence suggests physiotherapy following MUA, although no consensus exists regarding type or content of the treatment. Most of the included studies reported physiotherapy as a supplementary component to their primary research focus. There is a clear need for RCTs evaluating the effect of specific physiotherapy treatment after MUA.

312. Sex-specific differences in coronal knee alignment and CPAK distribution in an Austrian population

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Background: Coronal plane alignment of the knee is a key determinant of lower limb biomechanics, influencing tibiofemoral load distribution and the longevity of articular cartilage. Malalignment is implicated in the onset and progression of knee osteoarthritis. The Coronal Plane Alignment of the Knee (CPAK) classification combines the arithmetic hip–knee–ankle angle (aHKA) with joint line obliquity (JLO) to define nine distinct phenotypes.
Aim: To describe coronal plane alignment patterns and Coronal Plane Alignment of the Knee (CPAK) type distribution in an Austrian population, and to evaluate associations with sex, age, and body mass index (BMI).
Materials and Methods: In this retrospective study, 400 knees with complete demographic and radiographic data from standardized long-leg standing radiographs were analyzed. Mechanical lateral distal femoral angle (mLDFA), medial proximal tibial angle (MPTA), arithmetic hip–knee–ankle angle (aHKA), and joint line obliquity (JLO) were measured, and CPAK types were assigned. Statistical analysis included Shapiro–Wilk tests, Welch's t-test, Chi-square, Fisher's exact, binary logistic regression, linear regression, and multinomial logistic regression, with significance set at $p < 0.05$.
Results: The cohort comprised 266 females (68%) and 134 males (32%), with a mean age of 68.3 years and mean BMI of 30.4 kg/m². Mean aHKA was − 0.03°, with males showing greater varus alignment than females (−1.40° vs. +0.67°, p=0.00011). The most frequent CPAK types were I and II (each 21.8%), followed by VI (15.5%), III (15.3%), V (12.5%), and IV (11.3%). CPAK distribution differed by sex (p=0.023) but not by age group. Male sex increased the odds of varus alignment (OR≈2.27, p<0.001) and reduced the odds of valgus alignment (OR≈0.40, p<0.001). BMI was associated with varus alignment in males (p=0.033) but not in females.
Interpretation / Conclusion: In this Austrian cohort, males exhibited greater varus alignment and a distinct CPAK distribution compared to females, while age showed no effect on alignment patterns. BMI predicted varus alignment only in males. These findings provide valuable region-specific CPAK reference data for Austria, supporting individualized alignment strategies in total knee arthroplasty.

313. Impact of Smoking on Functional Recovery Following Total Knee Arthroplasty: A Large-Scale PROMs Analysis

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Background: Postoperative outcomes and patient satisfaction following primary total knee arthroplasty (TKA) depend on both surgical technique and patient-specific factors. While smoking is a known risk factor for wound complications and general health issues, its specific impact on functional recovery and patient-reported quality of life remains a critical area of investigation.
Aim: The objective of this study was to systematically evaluate the independent effect of smoking status on postoperative patient-reported outcome measures (PROMs) in patients undergoing primary TKA.
Materials and Methods: A retrospective review of 992 primary TKA patients (152 smokers, 840 non-smokers) was conducted between 2020 and 2023. Outcomes were measured preoperatively and at 12 months postoperatively using the EQ-5D-5L index, EQ-VAS, and KOOS subscales. Multivariate linear regression, adjusted for age, sex, BMI, and baseline scores, was utilized to isolate the independent impact of smoking.
Results: Preoperative PROMs were comparable between groups ($p > 0.05$). At 12 months, both groups showed significant clinical improvement ($p < 0.001$), but non-smokers achieved significantly higher scores across all measures, including EQ-5D-5L (0.82 +- 0.11 vs. $0.75 +- 0.13) and KOOS QoL (67.9 +-15.3 vs. 60.1 +- 16.8; all $p < 0.001$). Multivariate analysis confirmed smoking as an independent predictor of inferior outcomes for EQ-5D-5L (beta = -0.06), EQ-VAS (beta = -5.8), and KOOS QoL (beta = -6.1; all $p < 0.001$).
Interpretation / Conclusion: Smoking is independently associated with inferior functional recovery and quality of life 12 months after TKA. These findings highlight the clinical necessity of implementing structured preoperative smoking cessation programs to optimize long-term patient-reported outcomes.

314. Are preoperative psychological factors associated with chronic postoperative pain after total knee arthroplasty - a systematic review.

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Background: Total knee arthroplasty (TKA) is an commonly performed procedure for end-stage osteoarthritis, providing pain relief and functional improvement. However, about 10% experience persistent postoperative pain despite a technically successful surgery. Chronic postoperative pain can affect quality of life and rehabilitation outcomes. It has been suggested that chronic postoperative pain may be influenced by psychological factors.
Aim: To systematically review and synthesise evidence on the association between psychological factors and chronic postoperative pain at least one year after total knee arthroplasty.
Materials and Methods: A systematic review was conducted, following PRISMA guidelines, involving adults who underwent primary or revision TKA with pain assessed ≥12 months postoperatively. Searches were performed in MEDLINE and Embase, and risk of bias was assessed using the Newcastle-Ottawa Scale. Due to heterogeneity in study designs and outcome measures, a narrative synthesis was performed.
Results: Thirty-seven studies involving 17.258 patients were included. Twelve psychological factors were investigated, most commonly depressive symptoms (n=21), pain catastrophising (n=16), and anxiety (n=16). Findings showed no consistent associations across studies. Expectations were the only factor consistently linked to postoperative pain. Self-efficacy showed no association in any study. Other factors such as kinesiophobia, psychological distress, and additional psychological factors were examined in few studies, limiting generalisability. Most studies had moderate risk of bias, primarily due to reliance on self-reported measures and lack of non-exposed cohorts.
Interpretation / Conclusion: Due to substantial heterogeneity, no firm conclusions can be drawn regarding the impact of psychological factors on chronic postoperative pain one year after TKA. Expectations may play an important role, while self-efficacy appears unrelated. Importantly, most patients experienced pain relief regardless of psychological profile, supporting the overall effectiveness of TKA. Further research with standardised methods is needed to clarify these associations and advise clinical practice.

315. Functional Loading Reveals Greater Tibial Implant Micromotion in Mobile-Bearing Knees Versus Fixed-Bearing Designs

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Background: Differences in stress distribution between mobile-bearing (MB) and fixed-bearing (FB) lateral unicompartmental knee arthroplasty (UKA) designs may influence tibial and femoral component fixation. Implant inducible micromotions, measurable with dynamic radiostereometric analysis (dRSA), have been suggested to reflect the stability of the bone– implant interface.
Aim: The aim of this study was to compare inducible micromotions of MB and FB lateral UKA tibial components.
Materials and Methods: Seventeen patients with lateral knee osteoarthritis operated with a MB Oxford lateral domed UKA (MB group; n=8) or a FB Oxford Fixed Lateral UKA (FB group; n=9) were included. dRSA recordings of the knee were obtained cross-sectionally 1–7 years postoperatively during a 60° step-up and step-down exercise. Tibial implant migration was calculated using CT-based bone models and implant CAD models. The step cycle was divided into 11 phases to assess inducible micromotion during movement: phases 1–6 represented the step-up phase and phases 6–11 the step-down phase. Implant migration was quantified as translations, rotations, total translation (TT), total rotation (TR), and maximum total point motion (MTPM). The primary outcome measure was tibial component MTPM.
Results: The MB group demonstrated consistently higher MTPM values throughout the movement cycle compared with the FB group. During step-up, the between-group difference in MTPM was mean 0.18 mm (CI: 0.04; 0.32). During step-down, the MTPM difference was 0.22 mm (CI: 0.08; 0.36). At full leg extension, MTPM was 0.69 mm (CI: 0.55; 0.83) for MB UKA and 0.39 mm (CI: 0.26; 0.53) for FB UKA. Furthermore, anterior–posterior translation was higher in the MB group. During step-up, the difference in anterior–posterior translation was −0.10 (CI: −0.19; −0.01), and during step-down −0.14 (CI: −0.23; −0.05).
Interpretation / Conclusion: The MB group demonstrated higher inducible micromotion of the tibial implant during both step-up and step-down compared with the FB group. This was reflected by higher MTPM and increased anterior–posterior translation. These findings suggest design-related differences in implant fixation behavior during functional loading.

316. Medial congruent vs cruciate retaining TKA tibial insert design: a retrospective analysis of patient reported outcome measures in Lithuania

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Background: Despite technical success of the Total Knee Arthroplasty (TKA), patient satisfaction varies and patient reported outcome measures (PROMs) are becoming more important in measuring success of TKA. Due to the biomechanical similarity to the native knee, Medial Congruent (MC) tibial insert design has been showing promising results, however the literature on the comparison with Cruciate Retaining (CR) tibial insert design is scarce and conflicting.
Aim: To evaluate the early PROMs after TKA, and compare between patients receiving MC and patients receiving CR tibial insert designs.
Materials and Methods: Patients that underwent primary TKA and filled out Knee injury and Osteoarthritis Outcome Score (KOOS) before the surgery and 3 months after the surgery were included. Scores were evaluated, 0 represented severe symptoms, 100 represented absence of symptoms. Minimal clinically important differences (MCIDs), statistical ($p<0.05$) and clinical significance (≈10) were set.
Results: A total of 108 patients were included in the analysis. The age, BMI and sex were similar between the CR and MC groups (respectively 66.83 vs 65.37, $p=0.312$; 29.70 vs 30.10, $p=0.718$; sex distribution $p=0.357$). MC group reported higher preoperative scores in all subscales, the difference with CR group was statistically insignificant ($p>0.05$), but Sport subscale had clinically significant higher score. Absolute KOOS scores postoperatively were similar ($p>0.05$), with CR group reporting insignificantly higher scores in all subscales. CR was superior to MC in the change in KOOS scores, reporting higher change (Pain 29.2 vs 18.3; Symptoms 21.2 vs 15.4; ADL 29.5 vs 23.4; Sport 28.1 vs 14.1; QOL 34.0 vs 24.1). The difference in change was statistically ($p<0.05$) and clinically significant in Pain and Sport subscales, while clinically significant in QOL subscale. Both groups exceeded MCIDs in all subscales.
Interpretation / Conclusion: Both MC and CR tibial insert designs are effective in increasing KOOS score, however CR is more effective in increasing Pain, Sport and QOL subscales. Results could be influenced by higher preoperative scores reported by MC group, as limited possible improvement after TKA could be argued.

317. Genicular Artery Embolization Using Rapidly Resorbable, Gelatin-Based Microspheres for Osteoarthritis-Related Knee Pain

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Background: Genicular artery embolization (GAE) is an emerging minimally invasive therapy for osteoarthritis (OA)-related knee pain. Traditional embolic agents include imipenem/cilastatin and permanent microspheres, each with distinct limitations. Rapidly resorbable, gelatin-based microspheres (RRGM), designed specifically for GAE, may offer a promising alternative to traditional embolic agents.
Aim: To evaluate the safety and clinical outcomes of GAE using RRGM in participants with OA-related knee pain.
Materials and Methods: This prospective, single-center observational study consecutively included participants with OA-related knee pain refractory to conservative treatment who underwent GAE using RRGM. Safety, Numeric Rating Scale (NRS), and Knee Injury and Osteoarthritis Outcome Score (KOOS) were assessed at 6 weeks, 3-, 6-, and 12 months after treatment. Clinical benefit was evaluated using the minimum clinically important difference (MCID). Descriptive statistics were used, and changes over time were assessed with a nonparametric repeated-measures (Friedman) test.
Results: A total of 194 participants (median age, 69 years; IQR, 60.5-75 years; 114 females) underwent 239 GAE procedures using RRGM. Follow-up rates were 94% at 6 weeks (183/194), 89% at 3 months (172/194), 89% at 6 months (171/194), and 79% at 12 months (154/194). All procedures (239/239) were technically successful. Transient skin discoloration occurred after 15 procedures (6.3%), and one participant developed a superficial groin hematoma (0.4%), all resolved without sequelae. No severe adverse events were observed. Median NRS pain decreased from 7 (IQR, 6–8) at baseline to 3 (IQR, 2–5) at 12 months ($p < .001$), corresponding to a median reduction of 4 points (95% CI: 3.5–4.0). KOOS subscores showed statistically significant improvements across all domains. At 12 months, 55–80% of participants achieved improvements exceeding the MCID across the different patient-reported outcome measures.
Interpretation / Conclusion: GAE using RRGM is safe and associated with clinically meaningful improvement in participants with OA-related knee pain.

POSTER WALK 13: KNEE ARTHROPLASTY 2

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Oddrún Danielsen

Abdullahi Hirsi

Posters 318–326

318. One-Year Recovery Trajectories of Wearable-Derived Physical Activity Following Unilateral Total Knee Arthroplasty

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Background: Total knee arthroplasty (TKA) is an effective intervention for end-stage knee osteoarthritis; however, prior studies report conflicting findings regarding the recovery of real-world physical activity.
Aim: The aim of this study was to evaluate changes in physical activity during early and late recovery following unilateral total knee arthroplasty using wearable-derived acceleration signals.
Materials and Methods: We analyzed activity data from 18 patients undergoing unilateral TKA: 6 men and 12 women, with a mean age of 69.8 years and mean BMI of 28.6 kg/m². Physical activity was continuously recorded using a previously validated accelerometer. Outcomes included mean and maximum daily step counts and activity intensity counts, defined as the average acceleration magnitude per 5-second epoch across the recorded day. We analyzed data from three time periods: the preoperative period, comprising data from up to 14 days before surgery; a 14-day window approximately 3 months after surgery, representing early recovery; and a 14-day window approximately 1 year after surgery, representing late recovery. Comparisons between periods were performed using Wilcoxon signed-rank tests.
Results: Compared with the pre-operative period, physical activity remained reduced at 3 months. Mean daily steps decreased from 6,346. ± 2,945 to 5,000 ± 2,274 ($p = 0.01$) and mean daily activity intensity count slightly decreased (42,808 ± 16,912 vs. 38,497 ± 15,857; $p = 0.08$). Maximum daily steps (8,740 ± 4258 vs. 7,584 ± 3,667; $p = 0.21$) and maximum daily activity intensity count (55,730 ± 21,130 vs. 53,531 ± 22,032; $p = 0.34$) did not show statistically significant differences. By 1-year, mean daily steps (6,667 ± 2,779; $p = 0.34$) and mean daily activity intensity count (42,643 ± 16,632; $p = 0.67$) had returned to preoperative levels. In contrast, maximum daily steps (10,581 ± 4,904; $p = 0.007$) and maximum daily activity intensity count (63,917 ± 25,894; $p = 0.018$) exceeded baseline values.
Interpretation / Conclusion: Real-world activity recovery after TKA appears gradual. By one year, patients seem to resume habitual activity while demonstrating improved capacity for higher-intensity movement, suggesting enhanced functional performance beyond baseline.

319. Chronic Pain Composition Following Total Hip or Knee Arthroplasty: A Descriptive Study

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Background: Up to 20% of patients experience chronic pain following total hip arthroplasty (THA), total knee arthroplasty (TKA) and unicompartmental knee arthroplasty (UKA). Pain is increasingly recognised as multifactorial and may involve nociceptive, neuropathic and nociplastic components.
Aim: To explore the composition of pain, including nociceptive, neuropathic, nociplastic and fibromyalgia-like types, in patients with chronic pain after THA, TKA and UKA.
Materials and Methods: We invited patients reporting moderate-severe chronic pain (numerical rating scale (NRS) ≥4) one year after THA, TKA and UKA from earlier studies. They gave consent to be recontacted. The questionnaire included NRS, the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), the Douleur Neuropathique 4 interview (DN4i), the Fibromyalgia Survey Questionnaire (FSQ), and a series of questions assessing the International Association for the Study of Pain (IASP) criteria for nociplastic pain and complex regional pain syndrome (CRPS). Analyses were descriptive.
Results: Of 722 alive patients who had not undergone revision, 89% responded (171 THA, 345 TKA, 129 UKA). Moderate or severe chronic pain (NRS ≥4) remained in 52% of THA, 50% of TKA, and 56% of UKA patients, yet the majority would undergo surgery again (76% of THA, 59% of TKA, and 76% of UKA patients). 1% of the cohort reported a prior diagnosis of fibromyalgia, and another 1% reported known neuropathic pain. In contrast, possible neuropathic pain (DN4i ≥3) was identified in 23% of THA, 32% of TKA, and 32% of UKA patients, while CRPS symptoms were present in 2%, 19%, and 16%, respectively. Symptoms consistent with fibromyalgia were identified in 4% after THA and UKA, and 5% after TKA. Furthermore, 47% of THA, 43% of TKA, 57% of UKA patients reported that their current pain felt different than the pain they experienced before surgery.
Interpretation / Conclusion: Chronic pain after arthroplasty is heterogeneous and frequently involves non-nociceptive pain. The composition suggests that pain is often not explained by joint-related pathology alone. Improved phenotypic characterisation during the decision-making process may support better selection, counselling, and non-surgical management.

320. Primary Knee Arthroplasty for Acute Comminuted Proximal Tibia Fractures: A Feasibility Study

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Background: Acute comminuted proximal tibial fractures in older patients are difficult to treat with internal fixation due to poor bone quality and may lead to secondary displacement, axis deformity and post-traumatic osteoarthritis. Primary total knee arthroplasty offers an alternative, enabling immediate weight-bearing, but is it a feasible treatment option in acute cases?
Aim: To assess feasibility and early outcomes after primary TKA for acute comminuted proximal tibial fractures with immediate weight-bearing.
Materials and Methods: Consecutive patients aged ≥50 with complex uni- or bicondylar proximal tibial fractures, ≥1 cm articular depression, comminution and intact extensor mechanism were included in the ongoing study (October 2024–present). All underwent primary TKA with a revision tibial stem and metaphyseal sleeve with immediate full weight-bearing postoperatively. The femoral component was selected based on knee stability, using cruciate-retaining (CR), condylar constrained (CCK), or hinged components. Patient-reported outcomes (Oxford Knee Score (OKS), EQ-5D-5L) were assessed at 3 months, and 1 year. In hospital complications, readmissions or mortality ≤ 3 months and reoperations were registered.
Results: So far, we have included 12 patients with median age of 78 years (range 59-88) and 75% were female. The fractures were Schatzker 2 (n=5), 4 (n=1), 6 (n=6) and used TKA constraint were CR in 6 cases, CCK in 4 cases and hinged in 2 cases. Median time to surgery was 4 days (range 1-7). Median duration of surgery was 110 min (range 60-155) with no perioperative complications. Median length of stay 4.5 days (range 3-15). The in-hospital complications were peroneal nerve palsy (n=1), acute renal failure (n=1), anemia (n=1), and urinary tract infection (n=1).) At 3 months, median OKS were 25 (range 10-33) and EQ-5D-5L 0,7 (range -0,1 – 0,9). There were no deaths and only one readmission within 3 months. No one was reoperated.
Interpretation / Conclusion: Primary TKA using revision tibial stem and metaphyseal sleeve for complex acute proximal tibial fractures appears to be feasible. However, confirmation in larger studies with longer follow-up is warranted.

321. Clinical Outcomes and implant revision risk after the use of a tumor prosthesis at the knee in non-oncologic conditions.

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Background: Large bone defects around the knee remain a major challenge in orthopaedic reconstruction, typically following tumour resection, trauma or complex knee revision surgery. Tumour prostheses, originally developed for limb-sparing oncological procedures, are increasingly used in cases with severe bone loss. Despite clinical advances, complication rates remain high, highlighting the need for systematic outcome evaluation.
Aim: To evaluate implant survival, complication rates, and functional outcomes in patients treated with a tumour prosthesis around the knee for non-oncologic conditions.
Materials and Methods: This observational study included retrospective and prospective data from a patient cohort treated with a tumor prosthesis (Zimmer® Segmental System) around the knee between 2017 and 2022. Patients were identified through medical records and invited for follow-up in 2024– 2025, including clinical examination, and patient-reported outcomes. Data on complications, revisions and amputations were obtained from patient records. Statistical analyses included competing risk analysis for implant complication/revision, and Kaplan–Meier estimate for overall survival.
Results: 69 patients were included; 36 participated in clinical follow-up, 19 had died, and 14 were lost to clinical follow-up. Mean clinical follow-up was 59 months (range 26-96). Mean Oxford Knee Score was 29 (range 11-45), Oxford Hip Score was 35 (range 32-38), EQ-5D-5L utility score was 0.66 (range 0.016 – 1) and mean EQ-5D VAS was 60 (range 25-90). Seven patients had undergone major revision (n=5) or amputation (n=2). Overall, 23 (33%) patients had a postoperative complication, most commonly prolonged antibiotic treatment (n = 11), mechanical failure (n = 7) and infection (n = 5). One- and five-year patient survival was 90% and 73%. The five-year, cumulative incidence of complications, revisions, and amputations was 33%, 10% and 3%.
Interpretation / Conclusion: The use of a tumor prosthesis at the knee in non-oncologic conditions demonstrated a low risk of amputation and revision, and generally positive patient-reported outcomes, in spite of the complex circumstances with a substantial number of complications.

322. The effect of ceramic-coated (hypoallergenic) total knee implants on physical functioning, pain, and health-related quality of life after Total Knee Arthroplasty in patients with metal hypersensitivity.

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Background: Outcomes following primary total knee arthroplasty (TKA) are considered favorable, however a small subgroup of patients remains with aspecific unexplainable complaints. Metal hypersensitivity could be a reason for these complaints. It has been hypothesized that the immune system may react to the metal components of the prosthesis, leading to symptoms and potential implant loosening. In such cases a ceramic-coated hypoallergenic implant may offer a viable alternative.
Aim: To gain insight into self-reported physical function, pain, and health-related Quality of-Life (QoL) in metal-hypersensitive patients who received a primary or revision ceramic coated implant.
Materials and Methods: A retrospective cross-sectional cohort study. Physical functioning, pain, and health-related QoL were assessed using respectively the Knee Injury and Osteoarthritis Outcome Score (KOOS), a numeric rating scale (NRS), the EuroQol 5-Dimension questionnaire (EQ-5D-5L) and the 36-Item Short Form Health Survey questionnaire (SF-36). Results were compared to normative values (standard primary TKA, standard revision TKA, and a general population), where possible.
Results: Knee-specific functioning of the primary TKA study group (n=83) was comparable to norm data of standard primary TKAs and a general population, except for knee-specific QoL, which was scored lower by the study group. The results of the EQ-5D-5L and SF-36 regarding health-related QoL were contradicting. No statistically significant difference was seen between the index scores and those of the standard primary TKA population, yet the absolute scores of the study population were higher. The revision TKA group (n=20) scored worse than norm data of standard revision TKAs, standard primary TKAs and a general population in almost all domains. The outcomes suggest worse levels of physical functioning and QoL in that specific patient group.
Interpretation / Conclusion: Notably the revision TKA study group scored worse. The primary TKA study group was comparable to norm data of standard primary TKAs and a general population, except for (knee-specific) QoL.

323. Effect of the femur component positioning on bearing overhang in mobile bearing UKA

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Background: Although the Oxford mobile bearing UKA is a very reliable implant with long term survival, precise placement seems to be very important
Aim: This study analyzed the influence of the femur component placement in relation to the resulting bearing overhang or medial tightness for passive knee flexion in the mobile bearing .
Materials and Methods: Methods: Virtual biomechanics knee (VBK) model was virtually implanted with a mobile bearing UKA, using the appropriate component sizes and placements adhering to the current surgical technique. The VBK model consisted of the tibia/femur bone and cartilage 3D geometry derived from CT and MRI data sets. Passive soft tissue contributions were incorporated using a phenomenological ligament model validated against robot experimental testing.
Results: Results: Femur ML/tibia IE: Femur medial placement of 2.5mm combined with tibia internal rotation (figure 1) showed a peak BO of 3.8 mm (-4° tibia rotation). Femur ML/IE: Similarly, femur medial placement combined with femur internal rotations (figure 2) resulted in a peak BO of 3.4 mm (-2° femur rotation). Lateralized femur placement resulted in lower but not minimal BO (2 mm) for both component rotations. Tibia/femur component IE rotation variation resulted in BO below 2 mm (figure 3). Lowest BO was found to be close to the neutral component placement (area 1a: 2° tibia, 4° to 0° femur rotation, area 1b: 0 to 2° tibia, -6° femur rotation). Highest BO was found at 8° tibia external rotation combined with femur component rotational placements between -6° and 8° (area 3a) and for -8° tibia internal rotation with -6° to -8° femur internal rotation (area 3b).
Interpretation / Conclusion: Conclusions: Rotational placement (IE) of femur and tibia component showed low sensitivity to BO (< 1.8 mm). Component positioning around neutral position (+4° to -8° tibia IE rotation, +8° to -6° femur IE rotation) resulted in lowest BO. Tibia external rotations > 4° resulted in highest BO. Medialized femur component placement (> 1.5 mm) showed to have a higher impact on BO than a tibial component malrotation, therefore this should be avoided

324. Satisfaction and improvements after nonoperative treatment of knee osteoarthritis: Qualitative observations from a large cohort study

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Background: Knee osteoarthritis (OA) is highly prevalent in Denmark and may cause significant pain and physical impairment. Primary treatment includes physical therapy and analgesics, while surgery may be considered if insufficient. Treatment satisfaction is often measured using patient-reported outcome measures (PROMs), though subjective satisfaction does not always align with objective outcomes. Data from the parent project show a discrepancy where patients report satisfaction despite a decline in Oxford Knee Score (OKS). This phenomenon remains underexplored.
Aim: The aim of this study is to investigate the discrepancy between patient-reported satisfaction with conservative treatment and decline in knee function, measured both subjectively and via OKS
Materials and Methods: This study is embedded within a parent cohort of 939 patients with knee OA who completed a baseline questionnaire, 12-month PROMs, and underwent non-operative physical therapy. From this cohort, we observed 64 patients, who declined in their OKS from baseline to 12 ROM and - based on an anchor question - felt that the knee had deteriorated, and who paradoxically stated that they had been satisfied with treatment and concluded that they would repeat the non-operative treatment. Inductive thematic analysis of semi-structured interviews with 12 patients was conducted to explore the observed discrepancy, with data saturation achieved
Results: Through the analysis of the interviews, 63 item codes were discovered, and from them, four main themes emerged as potential reasons for the observed discrepancy: I. Subjective satisfaction with treatment, II. Internal locus of control, III. Attitude towards surgery, IV. Rehabilitation course. Throughout the interviews, patients expressed subjective satisfaction with the course of treatment despite objective improvement in knee function, a finding that was reflected across several of the identified themes.
Interpretation / Conclusion: Patient satisfaction with conservative knee OA treatment may remain high despite declining function and unattained personal success criteria. This discrepancy appears linked to broader interpretations of subjective patient satisfaction, an internal locus of control, and attitudes toward surgery.

325. Mapping Patients' Needs in European PJI Care: Perspective of Healthcare Professionals.

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Background: A periprosthetic joint infection (PJI) is considered a severe complication after hip or knee arthroplasty. It is expected to increase with the rising incidence of osteoarthritis and subsequent total joint replacement. Treatment often requires multiple surgeries, prolonged antibiotics, and functional limitations, resulting in biopsychosocial needs for the patients. Healthcare professionals' (HCPs) views on these (un)met needs and their healthcare system's support are unknown.

Aim: To explore HCPs' perceptions of (un)met biopsychosocial needs in patients suffering from PJI and the healthcare system's role in addressing them.

Materials and Methods: An online survey with closed and open questions was conducted among HCPs in Germany, the Netherlands, Norway, and the United Kingdom. Participants included orthopedic surgeons, physical therapists, (specialized) nurses, and other HCPs involved in PJI care. Questions addressed information provision, biopsychosocial support, and organizational barriers and facilitators across five time points: primary arthroplasty, diagnosis, treatment, rehabilitation, and long-term recovery. Closed questions were analyzed using various statistical tests, and open questions descriptively.

Results: 104 HCPs completed the survey. In all countries, psychological (un)met needs were most frequently reported, followed by social and physical (un)met needs. The number of reported needs varied between countries. Support for dealing with anxiety and stress was considered insufficient during rehabilitation and long-term recovery. Physical rehabilitation was perceived as well-organized. Most respondents felt patients were sufficiently informed about PJI, with cross-country differences. Differences were also seen in PJI risk communication and in the underestimation of the impact of PJI by patients and HCPs.

Interpretation / Conclusion: Psychological needs were the most prominent type of need reported by HCPs at all stages of PJI care. Cross-country differences suggest healthcare organization influences recognition and addressing of needs. These differences should be further explored in qualitative interviews. Addressing these needs may improve comprehensive, patient-centered care pathways.

326. Exploring patients' experiences and perceptions of manipulation under anaesthesia for stiffness after total knee arthroplasty: a qualitative study.

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Background: Given the worldwide high and increasing number of total knee arthroplasty (TKA) surgeries, persistent knee stiffness – limiting range of motion, daily function and quality of life, and linked to patient dissatisfaction – is a complication that will occur more frequently. Although manipulation under anaesthesia (MUA) is commonly used to treat knee stiffness, little is known about how patients are affected when MUA is necessary.
Aim: To gain an in-depth understanding of the experiences and perceptions of patients who require MUA due to persistent stiffness after TKA.
Materials and Methods: A pragmatic qualitative study using the interpretive description approach was used with reflexive thematic data analysis. Fifteen purposefully selected participants, with dysfunctional knee joint stiffness (flexion <90° and/or extension deficit ≥11°) requiring MUA, were interviewed.
Results: Six themes were developed: 1) Getting stuck: From limitation to stagnation – unexpected postoperative limitations with significant multifaceted impact; 2) MUA as a turning point: New beginning – renewed recovery after initially uncertainty; 3) Towards better recovery? Getting back on the bicycle, but not yet at the finish line – a demanding rehabilitation and presence of various limitations; 4) Emotional resilience: Coping with adversity and recovery – participants navigated uncertainty, fear, frustration, and dependence; 5) Support from and connection with healthcare providers and the environment: In trusted hands – support was pivotal; 6) Information and knowledge: Seeking clarity – clear information was lacking.
Interpretation / Conclusion: Recovery after TKA with persistent stiffness requiring MUA has severe physical, emotional and social impact. Although MUA can serve as a turning point, effective rehabilitation requires attention to biopsychosocial factors and the provision of clear patient information.

POSTER WALK 14: KNEE ARTHROPLASTY 3

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Jonathan Bjerre-Bastos

Jacob Fyhring Mortensen

Posters 327–335

327. Attitudes toward Physical Activity after Total Knee or Hip Arthroplasty: A Cross-Sectional Study of Physical Therapists in Germany, Norway, and the Netherlands

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Background: Total knee and hip arthroplasty (TKA/THA) remain standard treatments for end-stage osteoarthritis. Physical activity (PA) is critical for optimal functional outcomes during and after rehabilitation. The World Health Organization (WHO) recommends at least 150–300 minutes of moderate-intensity PA or 75– 150 minutes of vigorous PA per week. Nonetheless, many patients fail to comply adequately with PA recommendations. Reasons for this noncompliance are not yet fully understood.
Aim: To assess attitudes of physical therapists (PTs) regarding PA in TKA/THA patients across Germany, Norway, and the Netherlands, and explore how background factors, including different PT education standards and national healthcare settings, influence practices and recommendations.
Materials and Methods: A cross-sectional survey in Germany (n=113), Norway (n=83), and the Netherlands (n=156). Background characteristics and responses were analyzed using analysis of variance (ANOVA) and forward stepwise regression to identify predictors of positive attitudes.
Results: PTs from all countries showed positive attitudes toward post-TKA/THA PA, with notable variations. For example, comparing answers to the statement “I am familiar with the WHO recommendation for muscle-strengthening exercise,” significant differences were found comparing the German with the Norwegian and the Dutch cohorts (both $p<.001$), with the German reporting the least familiarity. Regarding the statement “I give PA advice”, Norwegian and Dutch PTs most often responded “Always”. In comparison, the German cohort had more participants answering “Sometimes”, resulting in a significant difference between Norway and Germany ($p=.009$). Predictors of positive PA attitudes included education, personal involvement in PA, and workplace support.
Interpretation / Conclusion: PTs’ attitudes were positive but varied by education and national healthcare structure. Findings highlight the need for tailored education and cross-national knowledge-sharing to support effective PA integration into TKA/THA rehabilitation. Standardized PA programs and consistent PT education, including international guidelines, could improve PA practices across countries.

328. Patient information needs after fast-track total knee arthroplasty: a qualitative study

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Background: Implementation of fast-track protocols has facilitated early discharge after total knee arthroplasty. Although most patients manage their recovery well, a notable proportion still contacts the hospital, highlighting gaps in patient information and communication.
Aim: The aim of this study was to explore patient information needs in the early postoperative period after total knee arthroplasty.
Materials and Methods: Using a qualitative exploratory design, data was collected through semi-structured individual interviews with patients consecutively recruited from Aalborg University Hospital (Farsoe). Interviews were conducted in October and November 2025. Patients were included, if they had received total knee arthroplasty during the last 1-4 weeks and consented to participate. All interviews were audio recorded, transcribed verbatim and analyzed inductively using thematic analysis guided by Kvale and Brinkmann.
Results: Nine patients (4 females, 5 males; mean age 65.1 year, SD 9.0) participated in the interviews, and three main themes were identified. First, postoperative pain, distress, and coping were experienced as challenging. Patients reported that the information received before and during hospitalization was insufficient to address their postoperative uncertainties, particularly regarding wound care and pain management. Second, rehabilitation was associated with motivation when patients experienced progress but also uncertainty, as patients expressed doubts about how to perform exercises correctly and safely. Third, patients articulated a need for more proactive follow-up from healthcare professionals, as they felt left on their own after discharge. This often led them to seek information online or contact the hospital for clarification.
Interpretation / Conclusion: This study highlights patients' need for ongoing information and support after fast-track total knee arthroplasty, with rehabilitation, pain management, and wound care as key areas of uncertainty.

329. 10-year follow-up after intra-articular injections of 2.5 % polyacrylamide hydrogel for knee osteoarthritis

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Background: Knee osteoarthritis (OA) is a prevalent degenerative joint disease that significantly impacts quality of life. Conventional management includes pain-relieving therapies and surgery, while interest in minimally invasive options is increasing. In 2021, intra-articular injection of 2.5% polyacrylamide hydrogel (iPAAG) was approved in Europe for symptomatic knee OA, but long-term safety data remain limited.
Aim: To evaluate the long-term safety of a single intra-articular injection of 2.5% iPAAG over a 10-year follow-up in patients with radiologically confirmed knee OA.
Materials and Methods: Patients treated off-label with 2.5% iPAAG for radiologically verified knee OA between 2010–2017 were recalled. Medical and surgical records were reviewed for injection-related adverse events and, where applicable, peri- and post-operative complications. Patients were interviewed for retrospective self-reported adverse events. Time from injection to knee surgery was recorded.
Results: A total of 61 patients (24 women, 37 men) participated. At time of injection, mean age was 64-years (range 34-84) and mean BMI was 27 kg/m2 (range 19-43 kg/m2). Some patients had treatment of both knees and 89 knees were included. Mean observation time from the iPAAG treatment to follow-up was 9.92-years (range 7-14). No significant AEs related to 2.5% iPAAG (e.g. allergic reactions, infections or systemic adverse events) were reported by patients or found in the records. Of the 89 knees, 50 (56.2%) did not require knee replacement during the follow-up period. In the remaining 39 cases (43.8%), a knee replacement was performed after a mean time lapse of 3.4 years (range 0.2–7.6). No unusual findings that could be related to 2.5% iPAAG-treatment were noted. However, post-surgical abnormal events were noted in 2 cases: 1 had prolonged knee bleeding and the other had an infection that required revision and prolonged antibiotics. Neither case was considered related to the prior 2.5% iPAAG-treatment.
Interpretation / Conclusion: Long-term follow-up indicates a favourable safety profile of 2.5% iPAAG, with no significant injection-related adverse events and no safety concerns identified during subsequent knee replacement surgery.

330. Blood-flow restriction exercise in a patient with knee pain, several prior surgeries, and concurrent musculoskeletal conditions: a case report

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Background: Low-load blood-flow restricted exercise (LL-BFRE) reduces pain and improves function in knee injuries, but patients with complex knee condition or additional health issues are often excluded from trials.
Aim: We report a 52-year-old woman with persistent unilateral knee pain, three prior knee surgeries, and contralateral limb immobilization who completed a 12-week home-based LL-BFRE program.
Materials and Methods: Exercises included bilateral squats, Bulgarian split squats, and glute bridges, performed three times weekly with a pneumatic cuff at 70% limb occlusion pressure.
Results: The patient completed 30 (83%) of the 36 planned sessions and 355 (82%) of the 432 prescribed sets with no adverse events. Improvements were observed in the pain, activities of daily living, sport and recreation, and quality of life subscales of the Knee Injury and Osteoarthritis Outcome Score.
Interpretation / Conclusion: This case indicates that LL-BFRE may be a safe, feasible and low-cost intervention with potential benefits for patients with complex knee conditions and additional health issues.

331. Early Implementation of Robotic-Assisted Total Knee Arthroplasty: A Multi-Stakeholder CFIR Study of Barriers and Facilitators

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Background: Adoption of robotic-assisted total knee arthroplasty (RA-TKA) is increasing in Denmark; however, real-world implementation in orthopaedic departments remains limited and poorly understood. Evidence on organisational and multidisciplinary factors influencing adoption is sparse.
Aim: To identify barriers and facilitators influencing early implementation of RA-TKA using a multi-stakeholder perspective within a Danish University Hospital.
Materials and Methods: Semi-structured interviews guided by the Consolidated Framework for Implementation Research (CFIR) were conducted with patients, orthopaedic surgeons, and operating room nurses during early implementation. Interviews were audio-recorded, transcribed, and analysed using thematic analysis mapped to CFIR domains.
Results: 15 healthcare professionals and patients were interviewed. Perceived benefits were enhanced intraoperative information, improved precision, and educational value, with potential benefits in complex cases and the ability to use collected data to refine surgical techniques. Key facilitators included structured training, hands-on support from the manufacturer, leadership endorsement, and dedicated team members supporting workflow integration. Barriers were largely logistical: longer setup times, limited structured training across a broader staff group, high costs, and the need to manage additional time requirements within existing production expectations. The learning curve was initially steep and could affect early efficiency, though iterative practice and collaboration helped overcome this. Patients consistently reported feeling safe, well cared for, and generally satisfied, highlighting that trust in the clinical team was central, while the robot itself had minimal influence.
Interpretation / Conclusion: Early implementation of RA-TKA is influenced more by multilevel organisational and workflow-related factors than by patient acceptance. While clinicians face logistical and training challenges, patients report high satisfaction independent of the technology. Successful adoption requires structured training, workflow integration, and alignment between technological innovation and clinical value.

332. Robot assisted joint arthroplasty: 1-year follow-up

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Background: In the modern world, conventional total joint replacement has become one of the routine orthopedic surgeries. However, 20% of those surgeries result in various unfavorable reports from patients. Implementation of robot-assisted systems brings out the possibility to overcome those precision challenges. Robotic systems enhance surgical precision and benefit functional recovery.
Aim: This study evaluates the 1-year clinical outcomes of patients undergoing robot-assisted joint replacement. The primary goal was to quantify the functional recovery trajectory and determine if robotic precision translates into a stable and predictable clinical plateau by the 12-month follow-up milestone.
Materials and Methods: At City Clinical Hospital No. 4 (Almaty, Kazakhstan), a prospective study of 21 patients (mean age: 64.8 ± 8.6 years; 71.4% female) was carried out. Implemented robotic systems include Mako, Cuvis Joint, and ROSA. Assessment of functional outcomes proceeded pre-operatively and post-operatively at 2, 6 and 12 months using the EQ-5D-5L, Oxford Knee Score (OKS), and Harris Hip Score (HHS). Specific focus was placed on the control of walking aids and pain relief.
Results: A serious improvement was observed across all metrics ($p < 0.001$). The mean EQ-VAS score rose from a baseline of 43.5 ± 12.4 to 91.4 ± 4.6 at 6 months, remaining stable at 92.1 ± 3.8 at the 12-month milestone. Joint-specific scores reached an "excellent" range by month 6 (OKS: 44.2 ± 2.8; HHS: 94) with no statistically significant decline at 1 year. Notably, while 85.7% of patients required assistive devices preoperatively, 100% of the cohort achieved and maintained independent, unassisted walking from the 6-month mark through the 12-month follow-up. Comparative analysis of the robotic systems showed no significant differences in functional outcomes at 1 year ($p = 0.55$).
Interpretation / Conclusion: Robotic assistance in arthroplasty ensures rapid functional recovery and a stable clinical plateau by the 6-month mark. The 1-year results confirm that robotic precision leads to high-quality, sustained outcomes and predictable restoration of mobility in the local clinical setting.

333. From Injection to Implant: Long-Term Clinical Evidence for Polyacrylamide Hydrogel in Knee Osteoarthritis

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Background: 2.5% injectable polyacrylamide hydrogel (iPAAG) forms a stable synovial implant within the synovial lining, restores elasticity, and reduces mechanical stress in knee OA.
Aim: This abstract summarizes preclinical and clinical evidence supporting 2.5% iPAAG as a long-acting knee OA treatment, focusing on mechanism, safety, and durability.
Materials and Methods: Evidence includes histopathology, biomechanical modelling, long-term data, and prospective clinical studies. ROSA: Randomized controlled trial comparing 2.5% iPAAG (N=119) with hyaluronic acid (HA; N=120) over 52 weeks, followed by a 5-year extension in iPAAG-treated patients (58 completers). LUNA: Prospective cohort (N=199) with 12-month follow-up. All WOMAC normalized to a 100-point scale.
Results: Animal histology shows stable synovial integration of 2.5% iPAAG with connective tissue anchoring and minimal inflammation for up to 24 months. Biomechanical modelling shows reduced synovial stress, supported by an equine OA model where 2.5% iPAAG restored synovial elasticity to levels in healthy tissue. In ROSA, 2.5% iPAAG achieved non-inferiority to HA for WOMAC pain at Week 26 (LSmean change −18.5 vs −14.8; difference 3.7 [95% CI −0.8; 8.1]), with similar results at Week 52. Long-term 2.5% iPAAG extension data showed sustained benefit at 5 years (pain −16.2; stiffness −12.7; function −11.4; all $p<0.0001$). No serious device-related AEs occurred. In LUNA, 12-month LSmean improvements were -17.0 (pain), -18.5 (stiffness), and -18.8 (function), all $p<0.0001$ vs baseline, with no serious device-related events. The durable symptom relief and favorable safety profile are supported by further observational data showing safety up to 10 years post-injection, including in patients undergoing knee replacement.
Interpretation / Conclusion: 2.5% iPAAG functions as a long-lasting implant within the synovial membrane that delivers sustained symptomatic relief in knee OA. Consistent evidence from prospective observational studies demonstrates durable clinical benefit for up to five years and long-term safety extending to ten years, supporting its role as a long-acting treatment option beyond conventional intra-articular injectables.

334. High-dose glucocorticoids and opioid consumption following elective hip and knee arthroplasty. A real-world analysis of a natural experiment

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Background: High-dose glucocorticoids are used to manage acute pain following primary total hip arthroplasty (THA) and knee arthroplasty (KA). In Denmark, the stepwise implementation of this treatment created a natural experiment
Aim: To estimate the effect of a single high dose of glucocorticoids (≥0.2mg/kg or 16mg dexamethasone, or ≥80 mg methylprednisolone) on opioid consumption in patients undergoing THA, unicompartmental KA, and total KA
Materials and Methods: This was a prespecified, retrospective, multicentre analysis using electronic health record data. We included all adults undergoing primary elective THA and KA in Eastern Denmark from 2017 to 2025. At each centre, patients operated on before implementation of high-dose glucocorticoids served as controls, whereas those treated after implementation comprised the intervention arm. The main analysis was on the intention-to-treat (ITT) population, i.e. analysed regardless of treatment received. The primary outcome was cumulative in-hospital opioid consumption within 24 hours, including doses administered at the end of surgery
Results: A total of 47,317 surgeries performed at 9 centres were analysed: 13,010 controls and 34,307 in the intervention arm. During the study period, 5 centres implemented high-dose glucocorticoids for THA patients, and 2 centres for KA patients. Adherence was high, with 6% of controls receiving the intervention, while 8% in the intervention arm failed to receive the intervention. The baseline 0-24-hour consumption was median 12mg iv morphine equivalents (IME) (IQR 5-20). In the ITT analysis, high-dose glucocorticoids resulted in a mean reduction of 3.1 IME (95% CI 2.7-3.5). The effect was larger in the per-protocol population (4.2 IME; 95% CI 3.8 to 4.7). Both estimates were below the prespecified minimal important difference of 5 IME. The intervention also reduced the maximum pain score during the first 24 hours by 0.8 points (95% CI 0.7-0.9) on the 0-10 NRS scale
Interpretation / Conclusion: In this real-world data analysis, a single high-dose glucocorticoids was associated with reduced opioid consumption and lower maximum pain scores in patients undergoing THA, UKA, and TKA. The observed difference did not reach the prespecified minimal important difference

335. Benzodiazepine, opioid, and concurrent use in patients undergoing revision hip and knee arthroplasty: Trends and risk factors in a nationwide cohort study

Melisa Castaneda-Vanegas[1], Manuela Yepes-Calderón[1,2], Jorge Vargas-Centeno[1], Marcel L. Bouvy[3], Liza N. van Steenbergen[4], Albert Dahan[5], Frits R. Rosendaal[2], Rob G.H.H. Nelissen[1,4], Gademan Maaike G.J.[1,2]
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Background: Concurrent opioid-benzodiazepine use is discouraged due to safety risks but remains common in primary arthroplasties. Knowledge about their use around revision arthroplasty is limited.
Aim: We examined outpatient opioid, benzodiazepine, and concurrent use before and after revision knee and hip arthroplasty (rTKA/rTHA), prescribing specialties, and risk factors for new concurrent prescriptions.
Materials and Methods: Data from the Dutch Arthroplasty Register and the Dutch Foundation for Pharmaceutical Statistics were linked for 2013–2022. Adults undergoing rTKA/rTHA were included. The prevalence of opioid, benzodiazepine, and concurrent use was assessed in 3-month intervals and by procedure year, covering the year before and 2-years post-surgery. Specialties issuing concurrent prescriptions were described. Potential risk factors (sex, age, and prior use of benzodiazepines/opioids/antidepressants) for new concurrent use within 90 days post-surgery were evaluated using multivariable logistic regression.
Results: Among 8,986 patients undergoing revision arthroplasty (hip: 4,414 ; knee: 4,572), the prevalence of pre and postoperative benzodiazepine use (17-28%) and concurrent use (8-12%) was relatively stable over time. Opioid prevalence increased over time with postoperative prevalences peaking within three months of surgery (69-80%) in 2021–2022. General practitioners issued combined prescriptions in ≥80% of concurrent prescribing cases at most time. The main risk factor was prior benzodiazepine use (hip OR:18.01, 95%CI:13.33–24.43; knee OR:27.95, 95%CI:20.74–37.90). Other risk factors included prior antidepressant use, being a woman, and smoking, whereas prior opioid use seemed protective (hip OR:0.69, 95%CI:0.51–0.92; knee OR:0.75, 95%CI:0.55–1.00).
Interpretation / Conclusion: Concurrent opioid-benzodiazepine use remained stable over time and was mainly prescribed by general practitioners. Prior benzodiazepine use was the main risk factor for new concurrent use. Evaluating preoperative medication history and engaging prescribers may reduce harm and improve pain management in revision arthroplasty.

POSTER WALK 15: HIP ARTHROPLASTY 1

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Christian Skovgaard Nielsen

Christian Bredgaard Jensen

Posters 336–342, 344–345

336. Association of pain comorbidity and perceived effect of total hip arthroplasty and daily step counts. Secondary analyses from a pragmatic, randomized, controlled, trial.

Theresa Bieler[1], Julie Midtgaard[2,3], Volkert Siersma[4], S. Peter Magnusson[1,2,5], Mie Rinaldo[1], Morten Torrild Schmiegelow[6], Søren Overgaard[2,6], Birgitte Hougs Kjær[1], Henrik Palm[6], Christian Have Dall[1,2], Morten Tange Kristensen[1,2]

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Background: Pain comorbidity may adversely affect total hip arthroplasty (THA) outcomes and pose barriers to postoperative physical activity (PA).
Aim: We investigated association of pain comorbidity and the perceived global effect of THA 3 months post-surgery and the effectiveness of an initiated PA intervention on daily step counts 6 months after THA.
Materials and Methods: Secondary analysis of an RCT on a pedometer-based multicomponent intervention including in-person and telephone counselling versus control (measurement only). Pain comorbidity was defined as none/mild or moderate+ perceived limitations from back, hip, or knee pain three months after THA and perceived global effect as much worse to much better than the pre-surgery state based on a 200mm visual analog scale measurement. Daily steps measured continuously from 3-6 months after THA were determined monthly as the average of one week. Secondary outcomes included change in chair stand-, stair climb- and 6-min walk test from 3-6 months after THA.
Results: Three months post-surgery the perceived effect of THA was lower in patients with moderate+ pain comorbidity compared to none/mild corresponding to 58mm±SD:36 versus 82±26; mean difference=24mm (95%CI:15-32). Among patients with none/mild pain comorbidity the intervention group improved daily steps more than control reaching 1727 (95%CI:206-3248) more daily steps at 6 months. Likewise, among patients with moderate+ pain comorbidity until one week after the last telephone counselling reaching 2214 (95%CI:431-3997) more daily steps. At 6 months it was no longer significant (538 daily steps 95%CI:-1144-2219). However, among the latter functional performance had improved more from 3-6 months in the intervention group than control with mean 2.7 (95%CI:1.6-3.8) chair stands vs. 0.9 (95%CI:-0.3-2.1); mean difference=1.8 (95%CI:0.2-3.4). Otherwise, no significant improvements were shown.
Interpretation / Conclusion: Patients with moderate or more severe pain comorbidity were associated with less from THA than patients with none/mild pain but with almost similar effect on daily steps from the intervention and translation into better chair stand performance.

337. Oxford Hip Score predicts postoperative activity – not patient perceived outcome after THA: An accelerometer based study with six years follow-up

Peter Bo Jørgensen[1], Steffan Tabori-Jensen [2], Maiken Stilling[2], Torben Bæk Hansen[1], Inger Mechlenburg[2], Sara Birch[1]

1. University clinic for hand, hip, and knee surgery, Gødstrup Hospital, Denmark 2. Department of Orthopaedics, Aarhus University Hospital, Denmark;

Background: Total hip arthroplasty is a common procedure for relieving pain and improving function and physical activity in patients who have severe hip osteoarthritis. Patients who have lower preoperative Oxford Hip Scores (OHS) tend to have greater potential for functional improvement and pain reduction. However, little is known about the association between preoperative OHS and midterm postoperative physical activity.
Aim: The primary aim of this study was to examine differences in cadence and step count before and after total hip arthroplasty between patients with high versus low preoperative OHS values.
Materials and Methods: In a nested cohort study, 59 patients undergoing total hip arthroplasty were monitored with OHS and accelerometer-based activity measurements for six years postoperatively. Spatio-temporal gait parameters and patient reported outcomes were compared between patients with low (<25) and high (>= 25) pre-operative OHS.
Results: Preoperative (mean (95% CI)) cadence (steps/minute) was lower in patients who had low OHS (83 (79 — 88)) compared to those with high OHS (91 (87 — 95)) (p=0.01). The preoperative step count was 4,433 (3,493 — 5,373) steps per day for patients who had low OHS and 4,848 (4,092 — 5,604) for patients who had high OHS (p=0.5). At six years follow-up, cadence remained lower in patients who had low OHS (82 (78 — 87)) compared to those with high OHS (90 (86 — 93)) (p=0.03). Step count was 4,446 (3,422— 5,470) steps per day for patients who had low OHS and 4,666 (3,833 — 5,498) for patients who had high OHS (p=0.7).
Interpretation / Conclusion: Patients with lower pre-operative OHS scores demonstrated consistently lower cadence both before and six years after total hip arthroplasty, whereas step count did not differ significantly between groups at either time point. These findings suggest that mid-term walking is influenced by preoperative functional status.

338. Transitions to subsequent primary arthroplasties and reoperations after an index hip arthroplasty due to osteoarthritis: a multi-state study of 140,650 patients from the Swedish Arthroplasty Register during 2008-2023

Peter Espinosa[1], Hanne Krage Carlsen [2], Annette W-Dahl [2,3], Ola Rolfson [2,5], Li Felländer-Tsai [4], Rudiger Weiss [1], Johan Kärrholm [2,5]

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Background: Subsequent arthroplasty related procedures in the hip and knee after index primary total hip arthroplasty (THA) for primary osteoarthritis (OA) are underexplored.
Aim: Our study investigates the sequence and possible risk factors of further primary arthroplasties and reoperations after an index THA in a multi-state fashion.
Materials and Methods: A multi-state analysis was conducted on 140,650 patients with index primary THA due to primary OA without prior arthroplasty in the hip or knee. Data were extracted from the Swedish Arthroplasty Register during 2008-2023. Hazard ratios (HR) are presented with 95% confidence intervals (CI).
Results: The mean age in the cohort was 68 years (SD 10) and the mean follow-up time was 7 years (SD 4). After the index THA, 71% of the patients did not undergo any additional procedures of the hip or knee. 26% underwent at least one or more additional primary arthroplasties and no secondary surgery. 2.4% of patients underwent a reoperation of the index THA and 1.9% had at least one or more additional primary arthroplasty and reoperation of any joint. Patients with multiple arthroplasties and any reoperation were younger (64 vs 69 years; $p < 0.001$). Female sex had a higher risk for a second hip and knee arthroplasty (HR 1.28, CI 1.25-1.31 and HR 1.37, CI 1.17-1.60 respectively). Body mass index (BMI) 25-29.9 and BMI ≥30 had a higher risk for a subsequent knee arthroplasty after an index THA (HR 1.81, CI 1.68-1.95 and 2.86, CI 2.65-3.10 respectively). BMI ≥30 had a higher risk for reoperation after an index THA and a subsequent second THA (HR 1.51, CI 1.38-1.65). ASA class ≥3 was associated with a higher risk of reoperation and death after both index THA (HR 1.58, CI1.41-1.67 and HR 2.13, CI 2.05-2.21, respectively) and second THA (HR 1.38, CI 1.18-1.60 and HR 2.10, CI 1.88-2.33, respectively).
Interpretation / Conclusion: Most patients had no subsequent arthroplasty or reoperation after a primary index THA. Factors such as younger age, female sex, BMI ≥25 and ASA-class were associated with an increased risk of further arthroplasty related surgery.

339. Validation of cause and extent of revision in the Danish Hip Arthroplasty Register: A nationwide study of 1,481 aseptic revision procedures

Ammar H.A. Ali[1], Peter Bremholm[1], Oskar E. Bilenberg[2], Mats Bue[2,3], Lena Hansen[4], Mia C. Sørensen[4], Thomas Jakobsen[4], Danni C. T. Høy[5], 6 Tobias Jonas Hammerhøy, B. Skov[7], Jonathan J. Bjerre-Bastos[7], Nikolaj P. Sode[7], Søren Overgaard[7,8], Lars L. Hermansen[1,9]

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Background: The Danish Hip Arthroplasty Register (DHR) was founded in 1995. Despite the importance and extensive use of the register, validation of DHR revision data remains limited. One of the most important contents of the register is the recording of revision procedures, as this measures implant survival and cause for the revision.

Aim: We aimed to validate the registered cause and extent of revision THA procedures in the DHR to improve the reliability of studies that currently or in the future use DHR revision data.

Materials and Methods: We randomly selected 1,500 aseptic revisions from Jan 2018 to Dec 2022, distributed across regions and revision causes. In each region, two researchers were appointed to review patient files and extract data. The reviewers were blinded to the data registered in the DHR. Revision cause was evaluated by marking up to three causes when multiple causes overlapped, and concordance was considered acceptable if at least one cause matched the DHR registration. Extent of revision was marked as total or partial, and if partial with specific component involvement. Discrepancies between the DHR data and the patient file review were reevaluated by an experienced hip arthroplasty surgeon to support the validation process.

Results: 1.481 patients were included, and the overall concordance between registered and reviewed revision causes was 81.5% (955 CI 79.4–83.4), whereas for the extent of the revision procedure it was 97.0% (96.0–97.8). Revisions for periprosthetic fractures and dislocations demonstrated the highest reliability, with correct registration in 96.5% (92.0–98.9) and 95.0% (92.0– 97.1) of cases, respectively. High validity was also observed for liner wear without loosening at 93.3% (88.1–96.8), aseptic loosening at 91.6% (88.2–94.3), and finally component failure at 91.3% (85.6– 95.3). Less specific causes (osteolysis, pain, and "other"), accounting for 8% of all revisions, showed lower validity. Excluding these three categories increased overall validity increased to 90.1% (88.2–91.8).

Interpretation / Conclusion: We found >90% concordance regarding both extent of revision and for the most common causes for revision surgery, which we believe is acceptable.

340. Screws Remain Anchored in the Pelvis While the Cup Settles in Cementless Acetabular Revision With Impaction Bone Grafting: A CT-RSA Study

Brandt Jonathan[1], Olof Sandberg[2], Rico Perlbach[1], Daphne Wezenberg[1], Mischa Woisetschläger[3], Jörg Schilcher[1]

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Background: Supplementary screw fixation is important for primary stability in cementless acetabular revision with impaction bone grafting (IBG), particularly in large bone defects. Multidirectional screw placement has been associated with improved construct stability and lower re-revision rates, yet how individual screws behave during postoperative settling remains unknown.

Aim: To characterize screw migration relative to the pelvis and cup in cementless acetabular revision with IBG using CT-based radiostereometric analysis (CT-RSA).

Materials and Methods: This retrospective study included 12 patients who underwent cementless acetabular revision with IBG (Paprosky defect ≥ 2A). All cups were fixed with multidirectional screws after preoperative 3D CT planning. CT-RSA assessed migration of the longest superior screw (n=12) and an anterior-inferior screw >15 mm (n=8) between the immediate postoperative and 24-month follow-up CTs. Migration was evaluated at the tip and the base of each screw, relative to both the pelvis and the cup. Rotation was assessed as the angular change of the screw relative to each body.

Results: Relative to the pelvis, screws showed minimal migration (<1 mm total translation) and rotation. Superior screws migrated a median of 0.37 mm at the tip and 0.61 mm at the base, and the anterior-inferior screws 0.70 mm and 0.76 mm, respectively. Relative to the cup, migration and rotation were greater, particularly at the screw tips, 2.93 mm vs 1.06 mm at the base for superior screws, and 1.19 mm vs 0.27 mm, respectively for anterior-inferior screws. Screw rotation strongly correlated with the tip–base migration difference ($r=0.995$ and 0.933, $p<0.001$).

Interpretation / Conclusion: CT-RSA showed that screws were stable relative to the pelvis but displayed substantial displacement relative to the cup, indicating that the motion primarily reflects cup migration. The greater displacement at the screw tips and its strong association with rotation suggest that the cup both translates and tilts as it settles into the graft bed. These findings support a scaffolding mechanism beyond simple compression, in which screws act as a mechanical stop limiting further migration.

341. Validation of the Aarhus periacetabular osteotomy database

Lisa Tønning[1,2], Frederik Foldager[1,2], Josefine Larsen [1,2], Pia Kristensen[1,2], Inger Mechlenburg[1,2,3], Kjeld Søballe[1], Stig Jakobsen [1]
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Background: Periacetabular osteotomy (PAO) is the preferred surgical treatment for hip dysplasia. In Denmark, patients undergoing PAO at two orthopaedic departments are registered in a disease registry, the Aarhus PAO-database.
Aim: This study aimed to validate the Aarhus PAO-database by assessing the registration completeness compared to the Danish National Patient Registry (DNPR).
Materials and Methods: Patients registered in the Aarhus PAO-database were compared to patients identified in DNPR as having undergone PAO for hip dysplasia. Further, a random selection of 20 PAO procedures from each registry per year(2014–2021) was validated by comparing the information from the registries to the hospital's electronic medical records.
Results: Between 2014 and 2021, 1144 PAO procedures were registered in the Aarhus PAO-database and 1150 in DNPR. The overall registration completeness was 94.7% (95% CI: 93.3;95.9) with 1116 PAO procedures included in both datasets. The diagnosis and surgery procedure were verified as hip dysplasia and PAO for all randomly selected patients, and almost all discrepancies were resolved (> 95%), using the medical records.
Interpretation / Conclusion: The Aarhus PAO-database has effectively captured all patients who underwent PAO for hip dysplasia from 2014 to 2021. It appears to be a valid resource for future research as well as for ensuring and improving the quality of hip dysplasia treatment.

342. Migration Patterns of Cemented Femoral Stems in Hip Replacement: A Systematic Review and Meta-Analysis of Clinical Radiostereometric Analysis Cohort Studies

Lisa van der Water[1], Christiaan Righolt[2,3,4], Trevor Gascoyne[2], Bart Kaptein[1], Rob Nelissen[1], Bart Pijls[1]
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Background: Aseptic loosening of implants can be predicted with early migration patterns measured with radiostereometric analysis (RSA). However, a systematic analysis of the migration patterns of cemented femoral stems is missing. Therefore, a systematic review and meta-analysis on RSA studies of cemented stems in primary total hip replacements was performed to determine the different migration patterns for cemented stems.
Aim: The aim was to evaluate the subsidence and retroversion patterns of cemented stems according to implant, patient, and study characteristics.
Materials and Methods: A systematic search of PubMed, Web of Science, Cochrane, and Embase retrieved all studies reporting radiostereometric analysis measurements of cemented stems of primary total hip replacements. Clinical studies with a postoperative reference and at least 2 postoperative radiostereometric measurements within 2 years were included. Subsidence and retroversion at 6 weeks, 3 and 6 months, 1, 2, 5 and 10 years were extracted along with variables such as surgical approach and inclusion period. The different stem types (composite beam, taper-slip, and resurfacing hips) were analyzed separately. Data was pooled for each timepoint and meta-analyses were performed using a random effects model.
Results: 47 studies (72 cohorts) on 2,118 cemented stems were included. 71 cohorts reported subsidence and 58 retroversion. At 2 years, pooled mean subsidence of composite beam stems was 0.19 mm (95% confidence interval [CI] 0.12-0.26), and retroversion was 0.56° (CI 0.40-0.72). At 2 years, pooled mean subsidence of taper-slip stems was 1.10 mm (CI 0.87-1.33) and retroversion was 1.15° (CI 0.81-1.48). Composite beam subsidence and retroversion stabilized after 1 year. Taper-slip stems showed no stabilization. Resurfacing hips (5 studies) showed almost no migration.
Interpretation / Conclusion: The cemented femoral stems showed different migration patterns for the different stem types. Taper-slip stems migrated most and continued to migrate, composite beam stems showed less migration with stabilization after 1 year, and resurfacing hips showed negligible migration.

344. Evaluating the Oxford Hip Score: Rasch and Confirmatory Factor Analysis Reveal Inadequate Structural Validity in a Danish Total Hip Arthroplasty Cohort

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Background: The Oxford Hip Score (OHS) is a widely used PROM in clinical research and national quality registries. The questionnaire content suggests a possible two-subscale structure of 'Pain' and 'Function', while OHS is typically reported as one total score. However, the validity of reporting OHS as two separate scores has been sparsely examined.

Aim: To compare the validity of the original structure (one total score) and an alternative two-subscale structure comprising separate 'Pain' and 'Function' subscales.

Materials and Methods: Preoperative and 1 year postoperative OHS data were obtained from a prospective cohort of 3,717 patients undergoing total hip arthroplasty (THA) at a single center. Structural validity was evaluated through Confirmatory Factor Analysis (CFA) exact and close fit, and Rasch item fit statistics. To reduce the risk of type I error due to excessive statistical power, 8 heterogeneous subsamples (women/men, left/right side, pre-/postoperative) of 100 randomly selected hip osteoarthritis (OA) patients were analyzed. For completeness, data from these 800 patients were pooled and reanalyzed by CFA. Floor and ceiling effects were also reported.

Results: CFA exact fit was rejected in 7 of 8 subsamples for both scale structures. For CFA close fit, rejection occurred in 4 of 8 subsamples for the total score, and in 3 of 8 for the two-subscale model. CFA of pooled data echoed these findings. Rasch analysis consistently showed item misfit across preoperative subsamples, while only minimal misfit was observed for 1 year data. Ceiling effects were substantial (>24%) across all subsamples at 1 year.

Interpretation / Conclusion: OHS did not fit the models regardless of structure. Yet, a two-subscale structure was superior, and researchers are encouraged to report 'pain' and 'function' scores separately. These findings raise concerns about the ability of OHS to evaluate OA patients undergoing THA. Substantial ceiling effects compromise the ability of OHS to compare interventions or new techniques at 1 year. Future research should consider whether earlier recovery phases, such as 3-6 months, or alternative outcome domains better capture clinically relevant differences.

345. 10-year nationwide trends in chromium and cobalt levels in patients with metal-on-metal total hip and resurfacing arthroplasty - results from Danish national registers

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Background: 1.5 million metal-on-metal (MoM) hip arthroplasties (HA) are implanted worldwide. Concerns are still raised regarding the side effects from cobalt and chromium ions released from MoM HA due to implant wear. However, long-term fluctuations in plasma concentrations of cobalt and chromium remain unknown.
Aim: To investigate if plasma concentrations of cobalt and chromium fluctuate in patients with a primary unilateral or bilateral MoM total hip arthroplasty or hip resurfacing arthroplasty.
Materials and Methods: Patients operated with a MoM HA during 2002-2012 were identified from the Danish Hip Arthroplasty Register. Plasma concentrations of cobalt and chromium were identified from the nationwide Clinical Laboratory Information Register and linked with data on cobalt and chromium plasma concentrations obtained from the patients' medical journals during 2012-2022. Plasma concentrations of cobalt and chromium were measured in nmol/L and presented as medians with interquartile range (IQR) in 3- year intervals based on date of primary surgery. Every patient with multiple plasma concentrations of the same ion in the same time interval counts one time with a collapsed mean value to avoid giving these patients too much weight in the analysis.
Results: We included 1,573 unilateral MoM HA surgeries and 232 bilateral MoM HA surgeries. In patients with unilateral MoM HA, cobalt concentrations increased over the 10-year time-period from 22.3 (IQR 15.3-35.2) to 30.0 (IQR 18.1-63.3) nmol/L. Chromium concentrations were stable at 27.0 (IQR 16.7-43.2) and 27.8 (IQR 16.6-48.3) nmol/L. Patients with a bilateral MoM HA showed higher but stable cobalt concentrations at 47.4 (IQR 31.4-90.6) and 48.4 (IQR 28.8- 99.2) nmol/L and decreasing chromium concentrations from 61.5 (IQR 37.1-91.0) to 48.3 (IQR 32.0-79.7) nmol/L.
Interpretation / Conclusion: Cobalt concentrations increased, and chromium concentrations were stable over the 10-year follow-up period in patients with unilateral MoM HA. In contrast, patients with bilateral MoM HA had stable cobalt concentration but decreasing chromium concentrations. As ion concentrations in patients may continue to increase, our findings confirm the need to follow some of the patients with regular follow-up.

POSTER WALK 16: HIP ARTHROPLASTY 2

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Armita Abedi

Marianne Westberg

Posters 346–355

346. Migration patterns of uncemented femoral stems in hip replacement: a systematic review and meta-analysis of clinical radiostereometric analysis cohort studies

Lisa van der Water[1], Christiaan Righolt[2,3,4], Trevor Gascoyne[2], Bart Kaptein[1], Rob Nelissen[1], Bart Pijls[1]
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Background: Early migration patterns measured with radiostereometric analysis (RSA) can predict late aseptic loosening of implants, but for uncemented stems migration patterns still have to be determined. Therefore we conducted a systematic review and meta-analysis of RSA studies on primary uncemented femoral stems.
Aim: The aim was to investigate the subsidence and retroversion patterns of uncemented stems according to implant, patient, and study characteristics.
Materials and Methods: A systematic search of PubMed, Web of Science, Cochrane, and Embase databases was performed to identify all RSA studies on femoral stem migration following primary uncemented total hip replacement. Clinical studies with 2 or more postoperative radiostereometric measurements within 2 years in addition to the postoperative baseline measurement were included. Subsidence and retroversion at 6 weeks, 3 and 6 months, 1, 2, 5 and 10 years were included for analysis. Extracted implant characteristics included implant design, coating, and surgical approach. Data was pooled at each timepoint and analyzed using a random effects model.
Results: 73 studies on 120 cohorts and 2,970 uncemented stems were included. 119 cohorts reported on subsidence and 91 on retroversion. The pooled subsidence of all stems at 3 months was 0.29 mm (95% confidence interval [CI] 0.19–0.39) and 0.32 mm (CI 0.21–0.43) at 2 years. The pooled retroversion of all stems at 3 months was 0.51° (CI 0.33–0.70) and 0.70° (CI 0.48–0.93) at 2 years. Hydroxyapatite-coated stems showed the least migration (subsidence 0.26 mm; CI 0.13–0.40; retroversion 0.51°; CI 0.22–0.80) among different coating types. The anterior approach showed more migration (subsidence 1.04 mm, CI 0.53–1.55; retroversion 1.52°, CI 1.08–1.95) than other surgical approaches.
Interpretation / Conclusion: Our study showed that most subsidence and retroversion of uncemented femoral stems occurred during the first 3 months. Stabilization of subsidence occurred after 3 months, and retroversion stabilized after 2 years. Migration patterns differed based on stem type, coating, surgical approach, the time period when inclusion started, and timing of baseline measurement.

347. Age-related differences in daily physical activity pattern three months after total hip replacement. An accelerometer-based observational study.

Theresa Bieler[1], Viktor Ziegler[1], Mikkel B. Overgaard[1], René Brüggebusch Svensson[2], Mikkel Holm Hjortshøj Jensen[2], S. Peter Magnusson[1,2,3], Morten Tange Kristensen[1,3], Christian Have Dall[1,3]

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Background: Physical activity (PA) is a well-established determinant of physical and general health but detailed information on daily PA patterns after total hip arthroplasty (THA) remain limited. Such knowledge is essential for informing and optimizing interventions supporting and enhancing postoperative PA.
Aim: Our aim was to describe the daily PA patterns three months after THA and explore the impact of age, sex, comorbidities, joint pain, educational length, and labor market participation.
Materials and Methods: A cross-sectional study of 169 patients (mean ± SD age of 67 ± 10 years, 108 women) with primary THA due to osteoarthritis participating in a randomized controlled trial. One-week accelerometer data from three months post-surgery was used to describe the PA pattern and how PA was distributed throughout the day. Activity counts (AC) which summarize total PA and consist of intensity and time in each activity were used for PA mapping and analyses of the impact of age (stratified in three groups <65-, 65-74- and ≥75 years), sex and dichotomized data of comorbidities, joint pain, educational length, and labor market participation.
Results: Independent of age, the PA mapping showed that daily activity tended to initiate between 6 and 8 a.m. The <65-year group had a maximum at 4-6 p.m., whereas the 65-74-year and the ≥75-year group peaked at 10-12 p.m. followed by an almost linear decline. The <65-year group had a stable and higher average daily AC (3185 ± 525) compared with the 65–74-year (2454 ± 683) and ≥75-year groups (2186 ± 589), with significant differences of 732 (95%CI: 206–1258) and 999 (95%CI: 518– 1481), respectively. Furthermore, daily AC was significantly lower in retired patients, those with ≥2 comorbidities, or those with education <16 years, whereas joint pain and sex were not significantly associated with daily AC.
Interpretation / Conclusion: Age strongly influenced PA patterns three months after THA; patients ≥65 years were less physically active than those <65 years and showed a marked decline in PA already from midday. Beyond age, PA interventions after THA should account for retirement status, comorbidities, and educational level.

348. Does Indication for Revision Influence Preoperative Function and Hip-Related Health in Revision Total Hip Replacement?

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Background: Limited evidence exists on preoperative functional status in patients scheduled for revision total hip replacement (THR), particularly across different indications for revision.
Aim: First, to evaluate muscle power, functional performance and patient-reported hip-related health among patients scheduled for revision THR by indication. Second, to examine associations between lower-extremity muscle power and both objective and patient-reported functional outcomes.
Materials and Methods: This cross-sectional study included 84 patients scheduled for first-time revision THR at eight Danish hospitals. Objective outcomes included the 30-second Chair Stand Test (30s-CST), 40-meter Fast-Paced Walk Test (40m-FPWT), 9- step Timed Stair Climb Test (9-step TSCT), and leg extensor power assessed using the Nottingham Power Rig (W/kg). Patient-reported hip-related health was assessed using the Hip Disability and Osteoarthritis Outcome Score (HOOS). Comparisons across indications (i.e. Loosening, Dislocation, Pain, Other) were performed using one-way ANOVA or Kruskal– Wallis tests. Associations between muscle power and outcomes were examined using linear regression.
Results: No significant differences were observed between indication subgroups for 30s-CST ($p=0.19$), 40m-FPWT ($p=0.74$), 9-step TSCT ($p=0.70$), or muscle power ($p=0.41$). In contrast, HOOS subscales differed for symptoms ($p=0.048$), pain ($p<0.001$), and activities of daily living ($p=0.033$), with the Dislocation subgroup reporting worse scores. Muscle power was positively associated with 30s-CST ($r_s=0.35$, $p=0.03$) and 40m-FPWT ($r_s=0.52$, $p<0.001$) and negatively associated with 9-step TSCT ($r_s=-0.58$, $p<0.001$). Associassions remained significant after multivariable adjustment.
Interpretation / Conclusion: Preoperative patient-reported but not objective functional performance and muscle power differ according to indication for patients with scheduled revision THR. Furthermore, muscle power is weakly to moderately associated with objective functional performance, but not with patient-reported outcomes. Preoperative assessment in revision THR should combine patient-reported and objective measures. Rehabilitation targeting muscle power may influence objective but not perceived function.

349. Femoral Cement-in-Cement Revisions are a Safe Treatment Option for Infected Hip Arthroplasty: Results of a Multicentre Retrospective Cohort Study

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Background: Current guidelines recommend complete removal of a well-fixed cement mantle during revision surgery for a periprosthetic joint infection (PJI) following total hip arthroplasty (THA). This approach is invasive and can be associated with substantial bone loss, increased operative time and elevated risk for aseptic loosening. An alternative strategy is to retain the femoral cement mantle and recement a new stem using the cement-in-cement technique.
Aim: To evaluate the efficacy and safety of the femoral cement-in-cement technique in the treatment of PJI following THA.
Materials and Methods: A total of 30 patients underwent revision surgery for PJI using the cement-in-cement technique in two hospitals in the Netherlands. The median follow-up was 23.3 months (interquartile range: 15.6 to 59.4). Infections were classified as early postoperative in 16 patients, acute haematogenous in 4, and chronic in 10 patients. 17 patients underwent a one-stage revision and 13 patients were treated with a two-stage revision procedure.
Results: 97% of the patients were infection-free one year after the cement-in-cement revision. Two patients required an additional debridement, antibiotics and implant retention (DAIR) procedure within the first two postoperative weeks due to prolonged wound leakage. Radiological follow-up demonstrated well-integrated femoral cement mantles in all cases one year after the cement-in-cement revision.
Interpretation / Conclusion: Femoral cement-in-cement revision is a safe and effective surgical option for treating PJI following THA, achieving high infection eradication rates across diverse patient groups and revision strategies. Successful outcomes depend on careful patient selection, appropriate technique, and the presence of a well-fixed femoral cement mantle. Compared with complete cement removal, this approach offers advantages including shorter operative time, reduced risk of aseptic loosening, and preservation of bone stock.

350. Regeneten® Augmentation in Open Hip Abductor Tendon Reconstructions

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Background: Surgical reconstruction of hip abductor tendon (HAT) ruptures at the greater trochanter (GT) is a relatively new procedure. Most ruptures are situated in the musculo-tendinous portion of the central and anterior segments of the Gluteus medius, which attaches to the lateral facet of the GT. The insertion has a characteristic fan-like, muscular-infiltrated attachment, with tendinous fibers primarily situated on the deep surface of the muscle. In selected cases involving macroscopical severe pathologies of the tendon, we have utilized Regeneten®, a type I collagen patch, as interpositional scaffold between the tendons and greater trochanter.
Aim: To evaluate the safety and patient outcomes associated with the use of Regeneten® during open surgical hip abductor tendon reconstruction.
Materials and Methods: In this retrospective case-series, patients surgically reconstructed with the application of Regeneten® between June 2022 and November 2024 and had completed a 12 months (m) follow-up (FU) were eligible. Patient reported outcome measures (PROMs) were completed preoperatively (preOP) and 12m FU and included: Copenhagen Hip and Groin Outcomes Score (HAGOS), Oxford Hip Score (OHS), lateral hip pain in rest and activity (NRS, 0-10), and Global Rating of Change (GROC). A test of physical function (30 second chair-stand test (CST)) was performed.
Results: 29 patients (28 women) with median (IQR) age of 63 (54;72) years and mean (95% CI) BMI of 28,2 (24.6; 29.9) kg/m2 were included. Significant improvements were observed from preOP to 12m FU across all PROMS (mean change(95% CI)); HAGOS pain subscale: 31.9(21.5;42.4) points, OHS: 15.2(11.1;19.2), lateral hip pain in rest: -3.1 (-4.3;-2) and activity: -4.9 (-6.2;-3.5). At 12 m FU success on the GROC score was 61%. CST improved from 11.6 to 15.1 repetitions, with a mean change (95%CI) of 3.5 (2.0;4.9) repetitions. Perioperatively, 18 partial- and 11 full-thickness tendon ruptures were noted. Three patients underwent revision surgery. None related to the application of Regeneten®.
Interpretation / Conclusion: Clinically relevant improvements in patient reported outcomes were seen 12 months after surgery, with no adverse events found in relation to the use of Regeneten® augmentation.

351. On the Value of Fluoroscopy-Guided Arthrocentesis Under Sedation in the Preoperative Work-Up for Revision Total Hip Arthroplasty

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Background: Accurate identification of the mechanism of implant failure is essential for successful revision THA, with the distinction between septic and aseptic failure as the key first step. The workhorse in the diagnostic process is the arthrocentesis. Too often, it is only performed in selected patients, under suboptimal conditions, and without a standardized protocol.
Aim: To evaluate the diagnostic performance of a routinely implemented, standardized fluoroscopy-guided arthrocentesis protocol performed under sedation prior to revision total hip arthroplasty.
Materials and Methods: This retrospective cohort study included all patients undergoing fluoroscopy-guided arthrocentesis under sedation at University Hospitals Leuven between 2021 and 2024. The primary outcome was agreement between pre- and postoperative EBJIS classifications. Secondary outcomes included rates of dry taps, unexpected positive intraoperative cultures (UPICs), culture-negative PJIs, the diagnostic yield of lavage aspiration, and the performance of key synovial biomarkers.
Results: A total of 312 patients (348 THAs) were included, of whom 181 (52%) underwent revision. Agreement between pre- and postoperative EBJIS classifications was near-perfect (κ = 0.935). UPICs occurred in 5 cases (2.8%), including 4 contaminations and 1 previously unrecognized infection. Dry taps occurred in 66 aspirations (19%), with lavage correctly identifying PJI in 27 cases (40.1%). Diagnostic accuracy was highest for WBC (AUC 0.915) and PMN (0.901), and lower for LDH (0.734), glucose (0.639), and synovial CRP (0.727). Culture, PCR, and alpha-defensin showed very high specificity (99.6–100%) but lower sensitivity (50– 56%).
Interpretation / Conclusion: A structured, image-guided arthrocentesis protocol with sedation provides reliable preoperative assessment in patients considered for revision THA. High agreement with postoperative EBJIS classifications, along with low rates of UPICs and dry taps, supports its diagnostic value and enables more consistent and confident preoperative evaluation, particularly in subtle or low-grade infections.

352. Predictive factors for successful same-day surgery after hip and knee arthroplasty – a retrospective cohort study from a Danish elective surgery center

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Background: Enhanced recovery pathways have optimized postoperative recovery and facilitated same-day surgery (SDS) for elective arthroplasty. Patient selection for SDS varies between institutions, and predictors of successful SDS remain unclear.
Aim: This study aims to identify predictors of successful SDS after primary unilateral total hip arthroplasty (THA), total knee arthroplasty (TKA), and unicompartmental knee arthroplasty (UKA) at a high-volume elective surgery center.
Materials and Methods: We conducted a retrospective observational study based on electronic health records at Silkeborg Regional Hospital, Denmark. All patients undergoing primary unilateral THA, TKA, or UKA between 2021 and 2025 were included. Successful SDS was defined as discharge on the day of surgery. Analyses were stratified by procedure. Multivariable logistic regression identified independent predictors, including patient-related (age, sex, body mass index, American society of anesthesiologists (ASA) classification, smoking status, civil status) and procedure-related factors (anaesthesia type, surgical end-time, duration, and year).
Results: A total of 4,335 patients were scheduled for SDS between 2021 and 2025 (THA: 1,914; TKA: 1,585; UKA: 836). Rates of successful SDS increased over the years, reaching 85% for THA, 92% for TKA, and 95% for UKA in 2025. Predictors associated with statistically significant increase in the odds of successful SDS were only identified for THA, including male sex (Odds ratio (OR) 1.9, 95%CI = [1.5–2.4]) and smoking (OR 1.7, [1.1–2.6]). Predictors of lower odds of successful SDS included, for THA: age <60 years (OR 0.7, [0.5–0.9]), ASA III (OR 0.7, [0.5– 1.0]), general anaesthesia (OR 0.4, [0.2–0.8]), and end-of-surgery time after 10 AM; for TKA: age >75 years (OR 0.5, [0.4–0.8]), ASA III (OR 0.6, [0.4–1.0]), and end-of-surgery time after 12 AM; and for UKA: age >75 years (OR 0.4, [0.2– 0.8]) and being divorced (OR 0.3, [0.2–0.7]).
Interpretation / Conclusion: Successful SDS after hip and knee arthroplasty is influenced by patient characteristics and perioperative factors. Identification of predictors for successful SDS may support individualized perioperative planning, and optimize resource utilization.

353. Attitude of German physiotherapists towards physical activity in patients after knee and hip replacement – does level of education play a role?

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Background: Total knee and hip arthroplasty (TKA/THA) represent the gold standard of treatment for patients with knee or hip osteoarthritis for whom conservative management options have failed. Given the aging and rising obesity levels observed in Western populations, a steady increase in TKA/THA demand is expected. Physical activity (PA) is crucial for achieving optimal TKA/THA functional outcomes. Yet most patients fail to comply with current PA recommendations. Physiotherapists (PTs) play a pivotal role in facilitating effective postoperative rehabilitation and promoting healthy lifestyle strategies.
Aim: To examine German PTs' attitudes towards PA in TKA/THA patients and to evaluate the impact of the educational training received by PTs (academic vs. non-academic/vocational) on their attitudes toward PA for this patient population.
Materials and Methods: A cross-sectional online survey was conducted in which German PTs were asked about their attitudes towards PA in their patients following TKA/THA. Responses from academically trained PTs were compared with those from vocationally trained PTs.
Results: Analyses incorporated data from 113 PTs. The main finding indicated academically trained PTs were significantly more familiar with WHO guidelines on PA (p=.010) and muscle strengthening (p=.034), while vocationally trained PTs had significantly (p<.005) more years of professional experience in TKA/THA patient management. Results indicated both groups recommended PA to TKA/THA patients, irrespective of PTs' knowledge or professional experience (n.s.)
Interpretation / Conclusion: While the knowledge base of German PTs regarding PA and strengthening guidelines differs depending on their training level, all respondents felt confident in providing advice on post-TKA/THA PA, irrespective of their educational level of training or professional experience. Furthermore, both groups consider PA advice to be an integral part of their professional profile. Whether academic training of PTs leads to different management of TKA/THA patients remains insufficiently established at present. Future studies should further explore the impact of academic PT training on the management of TKA/THA patients.

354. Custom 3D-Printed Acetabular Implants for Complex Acetabular Reconstruction: Outcomes in Paprosky Type III and Severe Defects

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Background: Reconstruction of Paprosky type 3A/3B or other severe acetabular defects remains a major challenge in revision hip arthroplasty. In cases of pelvic discontinuity and extensive bone loss, “off-the-shelf” implants are frequently inadequate. Patient-specific, 3D-printed triflange implants offer a solution for such complex cases. Clinical evidence on their performance remains limited.
Aim: To describe implant survival, complications, and surgical as well as patient-reported experiences following revision arthroplasty using custom-made 3D-printed aMace acetabular implants
Materials and Methods: Retrospective single-centre cohort study of 19 consecutive patients (13 W and 6 M) at a mean (SD) age of 64.9 (19.4) years, treated between 2019 and 2025 at Aarhus University Hospital by two experienced hip surgeons (ML and SSJ). All patients reported a history of multiple hip-related surgeries; however, the exact number of prior surgeries were not available for the entire cohort. Data on patient characteristics, perioperative variables, implant survival, complications, and patient-reported outcomes were obtained from medical records and structured patient interviews.
Results: At a mean (SD) follow-up of 3.5 (3.0) years, implant survival was 100%, with two hip-related reoperations: one for recurrent dislocation requiring exchange of the cemented cup, and one for distal screw loosening requiring subsequent fixation. Radiographic assessment demonstrated stable fixation in all other cases. No major intraoperative complications or postoperative infections were observed. The majority of patients reported high satisfaction, with substantial pain reduction and improved functional status. One patient died during follow-up from causes unrelated to the procedure
Interpretation / Conclusion: Custom-made 3D-printed acetabular triflange cups demonstrated reliable and favourable short- to mid-term results and patient-reported outcomes in this complex, small retrospective cohort. These findings support their role as a salvage option when conventional reconstruction is not feasible.

355. Same-Day Arthroplasty as the Dominant Pathway: A 5-Year Cohort from a Danish Fast-Track Centre

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Background: Osteoarthritis is a leading cause of disability worldwide, and increasing demand for total hip (THA), total knee (TKA), and unicompartmental knee arthroplasty (UKA) challenges healthcare systems to optimize patient pathways. Same-day arthroplasty is a safe and cost-effective alternative, yet its implementation remains variable.
Aim: To evaluate real-world adoption and outcomes of same-day arthroplasty in a high-volume fast-track setting.
Materials and Methods: This retrospective cohort study was conducted at a specialised orthopaedic centre in Silkeborg, Denmark. All procedures involving primary THA, TKA, or UKA between 2021 and 2025 were included. Outcomes were same-day booking and same-day discharge. Trends were analysed descriptively, and associations with same-day booking were examined using multivariable logistic regression.
Results: A total of 8,029 procedures were included. The proportion scheduled for same-day arthroplasty increased from 42% to 58% for THA, from 40% to 70% for TKA, and from 57% to 84% for UKA between 2021 and 2025. Among scheduled procedures, same-day discharge rates were 85% (THA), 92% (TKA), and 94% (UKA), with low readmission rates. Factors associated with same-day booking included male sex, age <60 years, ASA I, non-smoking status, BMI <30, no comorbidity, undergoing UKA, and being married.
Interpretation / Conclusion: Same-day arthroplasty became the dominant pathway, particularly for knee arthroplasty. These findings support broader implementation in high-volume centres, although further research is needed to inform patient selection. Continued increases suggest that the full potential may not yet have been reached.

POSTER WALK 17: INFECTION/AMPUTATION

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Ellen Hamborg-Petersen

Jens Kurt Johansen

Posters 356–358, 360–365

356. Association Between Foot Deformities and Amputation Risk in a Danish Diabetic Population

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Background: Foot deformities are recognized as a major contributor to the development of diabetic foot ulcerations, which leads to increased risk of lower-extremity amputations. However, research on foot deformities and their correlation with foot ulcerations and amputation risk individuals with diabetes is still limited.
Aim: The aim of this retrospective study is to identify individuals who have undergone lower-limb amputation in Denmark through procedural hospital codes for amputation and diagnostic criteria for diabetes and couple these criteria to individuals in the Danish Foot Database from 2016 to 2024, with registered foot deformity with the aim of identifying risk profiles related to subtypes of foot deformities.
Materials and Methods: A case-control study will be conducted among patients with diabetes, comparing individuals with a history of amputation to those without prior amputation. The study population will be identified through amputation procedure codes from the Danish National Patient Register (Landspatientregistret) and subsequently linked to data from the Danish Foot Study Database. Data in the Foot Status Database are based on a standardized foot assessment protocol that is performed during annual consultations for individuals with diabetes. Conditional logistic regression will be performed to assess the association between covariates and outcomes.
Results: Based on the predefined analysis plan, we expect the results to describe which foot deformities are most frequently associated with lower limb amputation. The forthcoming analysis will quantify the strength of these associations and identify which deformity profiles represent the highest risk for progression towards diabetic foot complications. With this information, the goal is to improve prevention strategies and reduce the progression of severe, life-altering outcomes such as amputation.
Interpretation / Conclusion: Data processing and statistical analysis are currently ongoing.

357. The Association Between Amputation Level and Patient-Reported Outcomes Following Municipality-Based Rehabilitation: A Cohort Study of 198 Prosthesis Users with Major Lower Extremity Amputation.

Jan Arnholtz Overgaard[1,2,3], Lisa Urup Tønning [4,5], Jesper Severin Eliassen [6], Bjarne Sommer Sørensen [6], Kajsa Lindberg [7], Morten Tange Kristensen [8,9], Inger Mechlenburg [4,5,10,11]

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Background: Evidence on patient-reported outcome measures (PROs) in individuals with major lower extremity amputation (LEA) who use a prosthesis and receive municipality-based rehabilitation is limited in particularly, the influence of amputation level.
Aim: To examine how amputation level affects PROs in individuals with major LEA who have completed prosthetic rehabilitation in Danish municipalities.
Materials and Methods: Cohort study using data from individuals with prosthesis fitting undergoing municipality-based rehabilitation in the Danish PROAMP database. The PROs were assessed at the start of independent and safe walking outside the parallel bars with prosthesis (baseline), and at the end of rehabilitation (follow-up). Outcomes included New Mobility Score (NMS, 0-9 points), Patient Specific Functional Scale (PSFS, 0-10 points), EQ-5D-5L index, and the EQ-VAS (0-100 score). Differences in PROs between transtibial amputation (TTA) and transfemoral amputation (TFA) were analysed using mixed-effect models, adjusted for sex and age at the time of amputation.
Results: A sample of 198 individuals (73% men) with a mean standard deviation (SD) age of 65.5 (13.5) years were studied. Ninety-eight had TTA and 100 had TFA, respectively. Both groups improved similarly in PSFS, EQ-5D-5L index and EQ-VAS score. The TFA group had a greater improvement in mobility, with a 1.9 point (95% CI: 1.0;2.9) larger improvement in the NMS than the TTA group after a mean (SD) rehabilitation period of 267 (118) days. Sex and age at time of amputation were not associated with changes in the EQ-5D-5L index nor the EQ-VAS score. Increasing age at time of amputation was significantly associated with higher PSFS scores (0.03 per year, 95% CI: 0.01;0.05) and lower NMS scores (-0.04 per year, 95% CI: -0.05;-0.02).
Interpretation / Conclusion: Individuals with TFA compared to TTA demonstrated larger improvement in self-reported mobility, as reflected by the New Mobility Score. Increasing age at the time of amputation was associated with better self-reported functional performance but reduced mobility.

358. Does the Amputation Level Influence Physical Performance After Municipality-Based Rehabilitation: A Cohort Study of 198 Prosthesis Users with Major Lower Extremity Amputation.

Jan Arnholtz Overgaard[1,2,3], Lisa Urup Tønning[4,5], Jesper Severin Eliassen[6], Bjarne Sommer Sørensen[6], Kajsa Lindberg[7], Morten Tange Kristensen[8,9], Inger Mechlenburg[4,5,10,11]

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Background: Evidence is limited on performance-based outcomes in individuals with major lower extremity amputation (LEA) undergoing municipality-based rehabilitation, including how amputation level affects physical performance.
Aim: To examine the association between amputation levels and improvement in physical performance outcomes in individuals with major LEA after prosthetic rehabilitation in Danish municipalities.
Materials and Methods: Cohort study using data from individuals with prosthesis fitting undergoing municipality-based rehabilitation in the Danish PROAMP database. The performance was assessed at start of walking independently and safely with walking aid out of parallel bars with prosthesis (baseline), and at the end of rehabilitation (follow-up). Outcomes included the Timed Up&Go test (TUG), 10 Meter Walk Test (10MWT), and 2 Minute Walk Test (2MWT). Differences between amputation level (Transtibial amputation (TTA) vs. Transfemoral amputation (TFA)) in functional mobility were analysed with repeated measurement analysis using mixed-effect models. The analysis was adjusted for age at amputation and sex.
Results: A total of 198 individuals with a mean standard deviation (SD) age of 65.5 (13.5) years (144 men) were studied. Ninety-eight had TTA and 100 TFA, respectively. Performance improved significantly on all three tests for individuals with both amputation levels after a mean (SD) rehabilitation period of 267 (118) days. Sex was not associated with improvement in performance, whereas older age at time of amputation was significantly associated with worse outcomes across the three tests ($p < 0.001$). Individuals with TTA improved on average 12.2 seconds (95% confidence interval (95%CI): 7.2;17.2) more than TFA on the TUG test. Contrary, TFA improved by 1.1 m/s (95%CI: 0.6;1.6) more in the 10MWT than the TTA group, while both groups had similar improvements in the 2MWT (-2.0 m 95%CI: -9.9;5.9).
Interpretation / Conclusion: Individuals with major LEA improved their physical performance significantly from baseline to end of rehabilitation. Higher age at time of amputation was associated with poorer performance, while improvements related to TTA vs. TFA differed.

360. Fracture-related infections: Combined Positive Microbiological Culture and Positive Histology Correlate with Clinical Outcome

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Background: Microbiological culture and histology of deep tissue specimens are independent diagnostic criteria in fracture-related infection (FRI).
Aim: However, the relationship between these tests has rarely been investigated, particularly in relation to clinical outcome after surgical treatment.
Materials and Methods: Patients having surgery for International Consensus-confirmed FRI were included. All had at least 5 tissue specimens taken for microbiological culture and 2-3 for histology. Clinical outcome was determined at one year after the index surgery. The correlation between cultured pathogen, bacterial virulence, histological positivity (defined as ≥5 polymorphonuclear neutrophils per high-power field), and outcome was examined.
Results: FRI was confirmed in 430 patients (mean age 51.7 years). 321(74.7%) were culture positive and 334(77.7%) histology positive. 265(61.6%) were positive for both tests. Staph. aureus was cultured in 170(42.5%), CoNS in 61(15.3%) and Gram negatives in 145(36.3%) cases. Virulent organism FRI was strongly associated with positive histology (Odds ratio 2.72;95%CI 1.61-4.58) but not clinical failure (OR 1.74;0.59-5.14). Staph. aureus was strongly associated with positive histology compared to all other organisms (OR 2.21;1.27-3.87). Surgery succeeded in 390(90.7%) patients. Combined positive culture and histology was strongly associated with clinical failure (OR 2.3;1.06-4.96). There was no difference in outcome between virulent and non-virulent bacteria when histology was positive, but both groups had higher failure rates than patients with negative culture or histology.
Interpretation / Conclusion: A pronounced inflammatory response, seen in histology, is a feature of virulent bacterial FRI. However, the presence of a virulent pathogen alone does not dictate clinical outcome in the absence of marked inflammation. This suggests that the outcome is at least as much a result of the host response as of the bacterium. When the pathological response is prominent, this may lead to tissue necrosis, further bacterial invasion of adjacent tissues, osteolysis, and loss of fracture stability, contributing to treatment failure. This warrants further study to understand the mechanisms underlying this interplay.

361. Predictors on non-suitability for prosthetic fitting: A Retrospective Cohort Study

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Background: Major lower extremity amputation (LEA) is a substantial clinical and societal challenge, predominantly affecting adults with dysvascular disease and leading to marked loss of function and quality of life. In Denmark, prosthetic suitability is determined during a brief in-hospital period, and only those classified as suitable or potentially suitable are referred to prosthesis-oriented rehabilitation. Existing prognostic tools focus on long-term walking outcomes in selected prosthesis-eligible populations and none address the first in-hospital assessment of prosthetic suitability.
Aim: To assess the concordance between in-hospital pre- and postoperative evaluations of prosthetic suitability and to identify predictors of non-suitability for prosthetic fitting in adults with major LEA.
Materials and Methods: We included 128 adults aged ≥50 years undergoing major LEA. Prosthetic suitability was clinically assessed at two time points, preoperatively and postoperatively, and categorised as suitable, potentially suitable, or non-suitable for prosthetic fitting. Concordance between pre- and postoperative evaluations was assessed using Cohen's kappa. For prognostic analyses, suitability categories were dichotomised into prosthetic suitability (suitable or potentially suitable) versus non-suitability. Potential predictors were examined using univariable logistic regression and then entered into multivariable models.
Results: Adults deemed suitable for prosthetic fitting were younger and had higher levels of pre-amputation mobility. Agreement between pre-and postoperative evaluations was moderate ($\kappa = 0.42$). After multivariable adjustment, lower pre-amputation mobility and poorer basic mobility at discharge remained statistically significant predictors of non-suitability for prosthetic fitting.
Interpretation / Conclusion: In-hospital pre- and postoperative assessments of prosthetic suitability showed only moderate agreement. Pre-amputation mobility and basic mobility at discharge independently predicted non-suitability, supporting the routine use of structured mobility assessment to improve prosthetic suitability classification and guide rehabilitation planning in adults with major LEA.

362. A Conservative Surgical Approach to Native Knee Septic Arthritis: Is Delayed Surgery Safe? A Retrospective Cohort Study of 207 Patients

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Background: Septic arthritis is an orthopaedic emergency requiring urgent management to prevent joint destruction and sepsis. However, indications and timing of surgery continue to be debated, and current SANJO guidelines recommend early surgical intervention.
Aim: We evaluated the outcomes of a less invasive strategy in which all patients initially undergo joint aspiration along with antibiotics, with subsequent surgical intervention guided by clinical and paraclinical assessment.
Materials and Methods: This retrospective cohort study included patients with suspected septic arthritis in a native knee joint (SANJO) from January 2018 - July 2025. Data were extracted from electronic health records, including demographics, comorbidities, microbiological findings, recurrence rates, and mortality. Inclusion criteria were age ≥18 years and clinical suspicion of septic arthritis in a native knee. Exclusion criteria included prior joint surgery, periarticular abscess, or osteomyelitis.
Results: We identified a total of 803 patients with a joint aspiration for culture, of these 207 were suspected SANJO in the knee. Mean age was 68.9 years (SD 17.5) and predominantly male (66.7%). Comorbidities were common, most frequently diabetes (18.4%) and arthritis (13.0%). Synovial fluid and blood cultures were positive in 21.7% and 12.6%, respectively. Aspiration plus antibiotics was sufficient in 72.5% (n=150). Among those requiring surgery, arthroscopic synovectomy was most common (n=51), with mean time to intervention of 4.12 days. The median length of hospital stay was 6 days. The recurrence rate was 7.7%, with all recurrences occurring within the first three months after initial treatment, and in-hospital mortality was 2.9%.
Interpretation / Conclusion: A less invasive initial strategy appears to be safe and effective, with over 70% successfully treated without surgery. Low mortality and recurrence rates support a more selective approach to surgery. Routine immediate arthroscopic synovectomy may be overly aggressive, and treatment should instead be guided by clinical response after aspiration and antibiotics, suggesting that strict adherence to current SANJO guidelines may not be necessary in all patients.

363. Acute infection with Klebsiella pneumoniae infection following anterior cruciate ligament reconsteruction

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Background: Primary anterior cruciate ligament (ACL) reconstruction is a common procedure, but postoperative joint infection remains a serious complication. Klebsiella pneumoniae is a rare pathogen in musculoskeletal infections and is typically associated with elderly, immunocompromised patients or those undergoing total knee arthroplasty (TKA) with delayed onset. We report a rare case of acute Klebsiella pneumoniae knee joint infection in an otherwise healthy young adult following ACL reconstruction
Aim: A 21-year-old immunocompetent man underwent arthroscopic ACL reconstruction and bilateral menisci repair. Five days postoperatively, he presented with fever and knee swelling. Laboratory investigations revealed elevated inflammatory markers (CRP 18.36 mg/dL) and a synovial fluid white blood cell count of 62,667/mm³. Joint aspiration culture confirmed Klebsiella pneumoniae infection. The patient was managed with prompt arthroscopic debridement and biofilm debulking, followed by an antibiotic regimen transitioning from intravenous piperacillin–tazobactam and levofloxacin to oral levofloxacin for a total of 8 weeks. The patient achieved complete symptom resolution within 35 days and demonstrated satisfactory functional recovery without recurrence.
Materials and Methods: case report
Results: Unlike previously reported cases which generally involved delayed infections in elderly patients with comorbidities or remote infectious foci, this case presented acutely in a young patient with no identifiable infection source. The acute onset may be attributed to the patient's robust immune response and the smaller implant burden of ACL reconstruction compared to TKA, which limits biofilm persistence.
Interpretation / Conclusion: This case highlights that early recognition, prompt arthroscopic intervention, and appropriate antimicrobial therapy can lead to successful outcomes in young, selected patients with acute Klebsiella pneumoniae knee joint infection.

364. Designing a global wound and plaster classification model for the HIP-STITCH study to analyse aberrant wound recovery fourteen days postoperatively

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Background: Total Hip Arthroplasty (THA) procedure is primarily performed in elderly patients, who are at increased risk of periprosthetic joint infections (PJIs) that could lead to revision surgery. To limit the risk of PJIs, it is crucial to support wound recovery as efficiently as possible. We therefore investigated the effect of four different suturing techniques on wound healing in elderly patients having undergone a THA through the anterior approach. Since no consensus exists on the classification of early wound healing, a wound and plaster classification system was developed to enable grading of aberrant wound healing in this study.
Aim: We aimed to design a wound and plaster classification model with adequate reproducibility to grade aberrant wound healing within the first fourteen days postoperatively.
Materials and Methods: An initial version of the wound and plaster classification model was developed; however, initial analysis data demonstrated inadequate reproducibility. A first revision introduced more precise descriptives, but reproducibility remained insufficient. Therefore, a second revision was performed. This involved restructuring the model into a more binary framework, resulting in a third version. Photographs of day 3 and 11 (plaster), and days 7 and 14 (wound) of fifty participants were assessed with versions 2 and 3 of the wound and plaster classification model by two experienced nurses. Inter- and intraobserver absolute agreement > 80% was considered sufficient.
Results: The absolute interobserver agreement was 71% and 73%, and the absolute intraobserver agreement was 68% and 69% (version 1 and version 2, respectively). The inter- and intraobserver absolute agreement of the plaster classification model was considered sufficient in both versions. The third version is currently being analysed and results will be presented at the conference.
Interpretation / Conclusion: The original wound and plaster classification system lacked sufficient reproducibility for aberrant wound grading. However, the newly designed model shows a promising improvement in the inter-and intraobserver reproducibility.

365. Bilateral total wrist arthroplasty infection secondary to Staphylococcus aureus bacteraemia treated successfully with a Debridement, Antibiotics, and Implant Retention procedure

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Background: Prosthetic joint infection (PJI) following total wrist arthroplasty (TWA) is a serious though rare complication. Late PJIs (>24 months postoperative) are typically caused by bacteraemia and hematogenous dissemination from other foci. In acute PJI or late acute PJI, a Debridement, Antibiotic, and Implant Retention (DAIR) surgical procedure, in addition to long-term antibiotic treatment, may be an option, but this has not previously been described in TWA.
Aim: The aim of this case report is to describe the disease and treatment course of a woman in her mid-60s with rheumatoid arthritis and bilateral TWA, who was admitted to the hospital acutely with a three-day history of fever and pain in her lower back, neck, and both wrists.
Materials and Methods: Laboratory investigations (leukocytes were 25x 10^9/L and C-reactive protein was 329,7 mg/L) and microscopic examination of cell culture from the left wrist, as well as imaging including CT and MRI of the spine and full body PET/CT, showed disseminated infection with S. aureus. The patient underwent a debridement, antibiotics and implant retention (DAIR) surgical procedure on both wrists, 7 days apart. Intraoperatively, extensive joint synovitis and tenosynovitis with metalogic and polyethylene wear-debris were debrided from flexor tendons. Histopathological examination demonstrated a foreign-body reaction and acute inflammatory changes consistent with bacterial infection. Local gentamycin (Gentacoll®) was applied around the TWA before skin closure. The patient received 4 weeks of IV cloxacillin and rifampicin, followed by 8 weeks of oral levofloxacin 500mg and rifampicin.
Results: At 8-month follow-up, the patient had no clinical signs of infection and no pain in her lower back, neck and right wrist, while some pain persisted in the left wrist. Furthermore, her wrist motion was good, but grip strength was reduced bilaterally compared with her preinfection status.
Interpretation / Conclusion: The case demonstrates that DAIR procedure and three months of antibiotics treatment can be successful for the treatment of acute hematogenous S. aureus infection in TWA PJI. Due to wear related tenosynovitis and bone resorption, we plan revision surgery on the left side (implant 9 year in situ).

POSTER WALK 18: FOOT/ANKLE

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Anton Nolte Peterlin

Hans Gottlieb

Posters 366–374

366. Advanced Practice Physiotherapy for Foot and Ankle Injuries in the Emergency Department: A Feasibility Study

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Background: Acute foot and ankle injuries are common emergency department (ED) presentations requiring assessment, imaging decisions, immobilization and discharge planning. Yet, crowded EDs and workforce shortages delay care. Advanced Practice Physiotherapists (APPs), working as primary-contact clinicians with advanced musculoskeletal expertise may release medical capacity, and improve access to efficient, high-quality care

Aim: To evaluate the feasibility of an APP-led care model for patients presenting to the ED with acute foot and ankle injuries, and to inform a future full-scale clinical trial

Materials and Methods: This prospective single-arm feasibility study included patients presenting to the ED with acute foot and ankle injuries. APPs independently assessed and managed patients. Feasibility outcomes were recruitment, acceptability, appropriateness, fidelity, follow-up response, and safety. Semi-structured interviews were conducted with patients, ED nurses, physicians, and APPs. Patient-reported outcome measures included pain interference, functional status, health-related quality of life, work ability, and satisfaction with care at baseline (pre-injury status), and 1, 4, and 12 weeks after ED attendance. Adverse events were monitored throughout follow-up

Results: 39 patients received APP-led care. Recruitment was 97.5%. Interviews were completed with 10 patients, 2 ED nurses, 2 physicians, and 2 APPs. All stakeholders considered the model acceptable and appropriate. Patients expressed confidence in APP assessment, clear communication, and reassurance regarding diagnosis and treatment. ED Staff described the APPs as valuable for managing musculoskeletal presentations and supporting ED workflow. Fidelity was 100%. Follow-up response rates were 77% at baseline, 62% at 1 week, 56% at 4 weeks, and 46% at 12 weeks. Three adverse events were reported; one was related to APP intervention, with no safety concerns identified

Interpretation / Conclusion: An APP-led care model for acute foot and ankle injuries in the ED was feasible, acceptable, and delivered with high fidelity. These findings support progression to a full-scale clinical trial evaluating effectiveness and cost-effectiveness. Future studies should improve follow-up response rates

367. Charcot reconstruction of the ankle and hindfoot: a retrospective consecutive cohort study

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Background: Charcot neuroarthropathy of the ankle and hindfoot is a limb-threatening condition associated with deformity, instability, and a high risk of ulceration and amputation. Reconstructive surgery aims to restore alignment and achieve limb salvage but is associated with substantial morbidity.
Aim: Aim of this study is to assess clinical outcomes, complications, and mortality following reconstructive treatment of Charcot neuroarthropathy of the ankle and hindfoot
Materials and Methods: In this retrospective consecutive cohort study, patients with Charcot neuroarthropathy of the ankle and hindfoot were identified . All patients treated at OUH between 2017 and 2026 were included. Twenty-five patients were identified, of whom 24 (96%) underwent surgical reconstruction. Mean age was 58.7 years (range 38–77), mean BMI 31.5 (22–55). The cohort comprised of 36% females and 64 % males. At presentation, 48% were classified as Eichenholtz stage 1–2 and 52% as stage 3 . Surgical techniques included intramedullary nailing (48%), screw fixation (20%), and plate fixation (28%). One patient (4%) was managed non-operatively.
Results: Reoperation was required in 8% (n=2). Postoperative infection occurred in 28% (n=7), and wound complications in 40% (n=10), these were treated with minor soft tissue revision. The amputation rate was 12% (n=3), all 3 had deep infection. One-year mortality was 8% (n=2), and five-year mortality was 28% (n=7), with a mean survival of 28 months (range 12–54).
Interpretation / Conclusion: Reconstruction of Charcot neuroarthropathy of the ankle and hindfoot is associated with high rates of complications and mortality; however, limb salvage is achieved in the majority of patients. We recommend strong fixation of the ankle and hindfoot. Patient treatment in a multidisciplinary team is mandatory.

368. Comparison of Clinical Efficacy Between Small Incision Oval Forceps-Assisted Needle Threading Repair and Minimally Invasive Locking Block Modified Krackow Technique in the Treatment of Acute Closed Achilles Tendon Rupture

Fushenhan Chen

Background: Acute Closed Achilles Tendon Rupture is a common injury following sports activities, and different suture techniques lead to varying prognoses. This study conducted a clinical analysis of two common repair methods.
Aim: To compare the clinical efficacy of small incision oval forceps-assisted needle threading repair and minimally invasive locking block modified Krackow technique for acute closed Achilles tendon rupture.
Materials and Methods: Twenty-five patients with acute closed Achilles tendon rupture admitted to the Department of Traumatic Orthopedics, the Third People's Hospital of Xiaoshan District, Hangzhou from June 2018 to June 2021 were enrolled in this prospective study. Patients were randomly divided into two groups: 13 cases underwent small incision oval forceps-assisted needle threading repair (12 males, 1 female; mean age 36±7.4 years), and 12 cases received minimally invasive locking block modified Krackow technique (11 males, 1 female; mean age 39±8.6 years). Perioperative indexes (operation time, intraoperative blood loss, wound healing) were recorded. All patients were followed up for 29±2.4 months (range 24-36 months). Outcome measures included AOFAS ankle-hindfoot score, ATRS, Arner-Lindholm excellent and good rate, ankle ROM, and postoperative complications.
Results: All 25 patients completed follow-up with no loss to follow-up. The operation time of the small incision group was (55.0±4.3) min, shorter than (61.8±5.8) min of the modified Krackow group; intraoperative blood loss was 25.0 mL and 30.0 mL respectively. No wound complications or severe adverse events (tendon re-rupture, sural nerve injury) occurred in either group. At 6 months postoperatively, ankle ROM recovered to over 90% of the healthy side in both groups. There were no significant differences in functional scores and excellent-good rate between the two groups (P>0.05).
Interpretation / Conclusion: Small incision oval forceps-assisted repair is simple, time-saving and equipment-friendly, suitable for primary hospitals. Minimally invasive locking block modified Krackow technique has better biomechanical stability, promoting early rehabilitation and faster functional recovery.

369. The CGM2.4 two-segment foot model discriminates gait kinematics in Progressive Collapsing Foot Deformity

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Background: Progressive Collapsing Foot Deformity (PCFD) alters foot and ankle mechanics during walking, leading to pain, functional impairment, and in severe cases the need for surgery. Objective assessment of foot kinematics is important to guide treatment decisions and evaluate outcomes. Traditionally, gait analysis represents the foot as a single rigid segment, misrepresenting pathological mechanics.
Aim: The aim was to investigate whether the CGM2.4 two-segment foot model can discriminate gait kinematics between individuals with PCFD and healthy controls.
Materials and Methods: Gait data were collected from 12 adults with PCFD (age: 58.3 ± 17.5 years; mass: 86.7 ± 17.1 kg) and 20 healthy controls (age: 33.9 ± 11.6 years; mass: 66.9 ± 10.8 kg). Participants completed 5 barefoot walking trials at self-selected speed. Forefoot-rearfoot and rearfoot-tibia joint angles were computed across all three planes using the CGM2.4 marker model. Discriminant validity was assessed using Statistical Parametric Mapping two-sample t-tests ($\alpha = 0.05$).
Results: PCFD patients exhibited reduced rearfoot-tibia plantarflexion and increased forefoot supination at initial contact. During midstance and toe-off, they showed greater forefoot abduction, increased rearfoot-tibia external rotation, and reduced plantarflexion at both joints. In swing, PCFD patients displayed elevated forefoot-rearfoot supination, forefoot abduction, and rear-foot-tibia external rotation.
Interpretation / Conclusion: The CGM2.4 two-segment foot model demonstrated clear discriminant validity, detecting altered foot kinematics across multiple gait phases. It offers surgeons a practical, objective tool to characterise dynamic deficits that static and clinical assessments cannot capture, with potential to aid pre-operative planning, patient selection, and post-operative evaluation.

370. Total Contact Casting Treatment of Diabetic Foot Ulcers in an outpatient clinic; results after implementation.

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Background: Diabetic foot ulcers are a major cause of disability and a leading cause of amputation and mortality among individuals with diabetes. One of the main treatments is offloading, where the gold standard is a total contact cast (TCC). Despite international guidelines recommending TCC, few centers have had it implemented. This project describes the results of implementing TCC in the treatment of diabetic foot ulcers in the outpatient clinic of a large orthopedic department.
Aim: To assess the effect of TCC on healing and complications in a diabetic foot ulcer cohort.
Materials and Methods: This study is a retrospective cohort study and was conducted as a quality project at the department of orthopedics, North Zealand Hospital. All individuals with a diabetic foot ulcer treated with a TCC between the 1st of April 2024 to the 28th of April 2025 were identified in the electronic health record system through procedure codes. Data was extracted from the electronic patient journal.
Results: A total of 72 individuals were identified, of whom 23 were excluded due to not having a diabetes diagnosis(n=18), not having an ulcer(n=3) or not being treated with a TCC(n=2) A total of 49 patients with 51 wounds were included of whom 46 (94%) were male, 3 (6%) had type 1 diabetes, and the median age was 68 (61.6-75.5 years). 40 (82%) participants had at least one surgery; 23 of these had combined 80 revisions. 42 (86%) of the participants needed admission with a median stay of 16 days (10-28). In total, 627 out-patient visits were conducted, 429 with TCC 198 without. Median visits with cast was 7 (5-12) In the observation period, 34 (69%) of the ulcers healed, and 5 (10%) participants died.
Interpretation / Conclusion: This study shows promising results when implementing TCC casting when treating diabetic foot ulcers in a Danish setting. Implementation of TCC casting is a complex task that demands a multidisciplinary team in close cooperation with the patient. TCC is the gold standard for offloading diabetic foot ulcers and the rising challenge of diabetes and diabetic foot complications in Denmark indicates that improved conservative treatments are needed to ensure optimized treatment of individuals with diabetic foot complications.

371. Return to professional football after Lisfranc luxation

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Background: Lisfranc injuries are usually career limiting or in some cases career ending injury. Maybe it does not always have to be this way. A 28-year professional football player twisted his left middle foot after a football tackle. The injury happened during a training camp in Spain. Nine days after the injury he was examined in Denmark. The foot was swollen and with hematoma around the midfoot. He was unable to weight bear. MRI showed Lisfranc luxation with bone oedema at TMT1- 5 and subluxation TMT 2. The diagnoses was further confirmed on standing x-rays.
Aim: To reduce and stabilize the TMT joints in a way that would make it possible for the player to return to play at the same level as prior to the injury.
Materials and Methods: The patient was tested in general anesthesia and ligamentous instability was found in the TMT 1+ 2. ORIF with 3 Arthrex staples over the TMT 1+2 were performed in order to prevent soft tissue disturbance and to preserve the joints. Careful placement of the staples was done, to not irritate the extensor hallucis longus and to avoid excessive compression at the TMT joints. The joints were carefully separated 2-3 mm before inserting the staples to not over compress the joints.
Results: After 5 months he returned to match play in Super League. February 26, he signed for another year playing for Sønderjyske. He complains about slight pain around TMT 1+2 when playing but he is still among the two fastest players in the team. Pain around MTP 1 when he runs faster than 20 km/h. The player does not want the staples out as long as he is still playing professionally.
Interpretation / Conclusion: Take home message: Return to professional football is possible after a Lisfranc luxation. Fast running is possible with a fixated TMT 1+2 Staples is an option for stabilizing TMT1+2 after a Lisfranc luxation

372. Damage To The N. Peroneus Superficialis During Plate Fixation For Lateral Malleolus Fracture - A Cadaver Study

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Background: Injury to the Nervus Peroneus Superficialis (NPS) following Open Reduction and Internal Fixation (ORIF) of lateral malleolus fractures has been reported in up to 21% of patients. Although surgical approaches and plating techniques are well established, there is limited evidence on the risk of NPS damage during surgery when performed by junior surgeons. Quantitative anatomical data relevant to incision placement and nerve localisation also remain sparse.
Aim: To determine: (1) the incidence of NPS injury during exposure and subcutaneous closure in a simulated lateral malleolus ORIF performed by junior surgeons; (2) the anatomical position of the NPS relative to the surgical incision and distal fibula.
Materials and Methods: This cadaver study comprised 20 lower limbs. Junior surgeons received a standardized instruction on anatomy and technique before performing a lateral approach to the distal fibula, applying a six-hole semitubular plate, and undertaking subcutaneous closure. A supervised fasciotomy was then done to identify the NPS and assess: (1) dissection-related nerve injury; (2) entrapment of the NPS in sutures; (3) shortest distance from incision to the NPS; and (4) distance from the tip of the distal fibula to the NPS crossing point. Distances are reported as mean ± Standard Deviation (SD).
Results: In total, 20 junior surgeons, mostly residents (8 female, 12 male), performed the surgery. In one specimen the NPS could not be located. No dissection-related NPS injuries occurred (0/20). NPS entrapment was seen in one of 18 procedures where subcutaneous sutures were used (1/18). Shortest mean distance from incision to the NPS was 14.7 ± 6.1 mm. Mean distance from the tip of the distal fibula to the NPS crossing point of the fibula was 222.1 ± 34.7 mm.
Interpretation / Conclusion: Junior surgeons, with proper guidance, can perform lateral malleolus ORIF without causing NPS injury. One case of suture entrapment highlights the critical risk of nerve damage during closure. Anatomical variation underscores the need for nerve awareness and careful soft-tissue handling. These findings may improve surgical training, incision planning, and strategies to reduce nerve injury during distal fibular fixation.

373. Arthroscopic Drilling Combined with Temporary Ankle Arthrodiastasis for Symptomatic Osteochondral Lesions of the Talus in Children and Adolescents: A Retrospective Case Series

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1. Nationwide Children's Hospital

Background: Osteochondral lesions of the talus (OLT) can cause substantial ankle pain and functional limitation in adolescents. Arthroscopic bone marrow stimulation (BMS) is widely used yet has reported mid- to long-term failure rates of 15–30%. By combining ankle arthrodiastasis with the traditional surgical treatment there may be improved rates of healing in these patients.
Aim: The aim was to describe our technique and evaluate early treatment outcomes of combined arthroscopic drilling with temporary ankle hinged arthrodiastasis in adolescents with symptomatic osteochondral lesions of the talus that did not improve with conservative management.
Materials and Methods: We conducted a retrospective review of consecutively treated skeletally immature patients aged <16 years managed with a standardized protocol of ankle arthroscopy with BMS followed by temporary hinged ankle arthrodiastasis. Arthroscopy involved lesion assessment and subchondral perforation with K wires under direct visualization. A circular external fixator was applied with hinges aligned to the ankle rotation center. Acute distraction of 6–10 mm was performed. Patients were allowed to be weight-bearing as tolerated with immediate range-of-motion.
Results: 5 patients had drilling and hinged arthrodiastasis at a mean age of 13 years. All lesions involved the medial talar dome. External fixation averaged 10 weeks and follow-up ranged from 14 months to 8 years with no loss to follow-up. All patients had clinically meaningful improvement, with no activity-limiting pain and return to school/recreational sports without restrictions. Radiographs demonstrated universal healing of all lesions including preserved joint congruity and stable subchondral architecture without progression. Complications were limited to mild pin-site irritation in two patients. No unplanned reoperations occurred.
Interpretation / Conclusion: To our knowledge this pediatric case series, represents the first description of the technique combining arthroscopic drilling with temporary hinged ankle arthrodiastasis to treat refractory OLT. We determined the method was feasible and demonstrated uniformly promising early-to-midterm outcomes after failed nonoperative management of symptomatic OLT.

374. The Modified 7-item Danish Exercise Induced Lower Leg Pain Questionnaire (EILP-D) Shows Excellent Psychometric Properties For Patients With Chronic Exertional Compartment Syndrome; A Translation and Rasch Analysis Study

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Background: Chronic exertional compartment syndrome (CECS) of the lower leg is a condition of pain induced by exercise accounting for roughly 25% of lower leg pain in athletes. The pathophysiology includes abnormal elevation in compartment pressure, inducing hypoperfusion and painful ischemia affecting nerves and impairing muscle function. Primary treatment options include open or endoscopic fasciotomy and gait rehabilitation. There is currently a shortage of patient reported outcome measures (PROMs) for Danish patients with CECS, hampering standardized evaluation and reporting of patient subjective symptoms and abilities. EILP-Q is developed for German speaking patients and considered the gold standard, although it has not been evaluated using modern test theory (MTT).
Aim: To translate and validate the EILP-Q in a Danish cohort of patients with CECS using Rasch analysis.
Materials and Methods: The 10-item EILP-Q was translated into Danish using forward–backward translation. PROM data were collected in a prospective single-center cohort prior to treatment allocation. Psychometric evaluation was conducted using Rasch analysis, including assessment of scale-to-sample targeting, response category functioning, local dependence (LD), and item fit statistics (restscore associations, outfit/infit). These analyses evaluate whether the scale measures symptom severity appropriately, whether response categories function as intended, and whether items contribute meaningfully to the construct.
Results: 102 patients were included. The scale showed good targeting, indicating alignment between patient symptom severity and item difficulty. Response categories functioned adequately. LD was abundant. Items 2, 5, and 6 misfitted the model, inducing potential measurement error. Based on LD and item fit analyses, adjustments were explored. A revised 7-item Danish EILP, excluding items 2, 5, and 7, demonstrated improved psychometric properties, with good item fit and only minor LD.
Interpretation / Conclusion: The EILP-Q was successfully translated into Danish. This is the first study to evaluate the scale using an MTT model. Reducing the scale to a 7-item version (EILP-D) improved psychometric performance and measurement precision in patients with CECS.

POSTER WALK 19: EXPERIMENTAL/NON-CLINICAL

Wednesday, 11 November 2026

16:30 – 18:00

Room: Foyer

Moderators:

Mikkel Henningsen

Jonas Askø Andersen

Posters 375–386

375. In-house 3D-printed porous implants: In-vivo study in sheep of two implants design for future custom-made prosthesis.

Anna B. Borgognoni[1], Sarah S. Freund[1], Jørgen Baas[1], Michael M. Bendtsen[1], Jeppe S. Byskov[2], Bahram Ranjkesh[3], Jens R. Nyengaard[4], Ruben Pauwels[3], Thomas Baad-Hansen[1]

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Background: Early osseointegration is essential for long-term implant stability. Porous 3D-printed titanium implants may enhance bone ingrowth by facilitating cellular migration and tissue formation, but increasing porosity may compromise mechanical strength. In-house implant development may enable rapid design and production of custom-made prostheses, but preclinical evaluation is needed.

Aim: To compare two in-house 3D-printed porous titanium implant designs with different pore size and porosity in terms of early mechanical fixation and histological osseointegration in a sheep model.

Materials and Methods: Twenty female sheep received one cylindrical Ti6Al4V implant in the medial femoral condyle. Implants were randomized to one of two porous designs: P1 with 630 µm pore size and 73.9% porosity, and P2 with 690 µm pore size and 69.1% porosity. After 4 weeks, specimens were harvested for axial push-out testing and histomorphometry. Mechanical outcomes included shear strength, stiffness, and energy absorption. Histomorphometry quantified bone and fibrous tissue in the gap zone and bone ongrowth at the implant surface.

Results: Two implants, one in each group, were excluded from mechanical analysis because they did not withstand preload testing. Mechanical fixation was similar between groups: median shear strength was 0.10 MPa (IQR 0.26) for P1 and 0.09 MPa (IQR 0.09) for P2; median energy absorption was 41.2 J/m² (IQR 87.7) and 16.4 J/m² (IQR 45.7), and median stiffness was 0.21 MPa/mm (IQR 1.33) and 0.21 MPa/mm (IQR 0.16), respectively. Histomorphometry also showed comparable results. In the gap zone, median bone fraction was 0.16 (IQR 0.08) for P1 and 0.15 (IQR 0.10) for P2, while fibrous tissue fraction was 0.63 (IQR 0.93) and 0.61 (IQR 0.10). Bone ongrowth at the implant surface was minimal in both groups. No foreign body reaction was observed.

Interpretation / Conclusion: The two in-house 3D-printed porous titanium implant designs showed similar early osseointegration and mechanical fixation in this sheep model. The findings support the feasibility of rapid in-house development of custom porous implants, while future studies should evaluate weight-bearing models and longer follow-up.

376. Gender Bias in Publicly Available Photographs of Orthopaedic Congresses in Germany

Tamara Dietrich[1,2], Julius Krüger [1,3], Lorenz Suchy [4], Xiaohua Wang [1,3], Vera Jaecker [1], Nicole Lange [5], Tobias Winkler [1,2,6], Markus Scheibel [1,7], Alexander Hildebrandt [1,2], Marie Fridberg [8], Tazio Maleitzke [1,2,3,9]
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Background: Gender inequality poses a challenge in healthcare and specifically orthopaedic surgery. Although female medical graduates exceed those of men, senior positions remain predominantly male. This imbalance may be preserved by gender stereotypes and limited visibility of female role-models.
Aim: This study assessed the visibility of women and men in official photos of German orthopaedic congresses from 2010 to 2024 and compared them with attendance data.
Materials and Methods: A total of 25,620 publicly available images from 133 German orthopaedic congresses were analysed. Individuals depicted were categorised as women, men, or undefined based on facial features. Interrater and intrarater reliability were assessed using Krippendorff's alpha. The total number of women and men photographed, as well as women to men ratios on photos were compared to conference attendance statistics.
Results: Overall, 77,895 individuals were identified on 24,380 images. Interrater reliability was 0.83-0.93 (95 % CI: 0.75-0.88 to 0.90-0.98), and intrarater reliability was 0.83-0.95 (95 % CI: 0.75-0.91 to 0.90-0.99), indicating high consistency. While 24% of conference participants were women, men accounted for 75.9%. Only 20.7% of photographed participants were women (n=16,166), while 79.2% of photographed attendees were men (n=61,729). Women appeared in 29.4% of images, predominantly with > 2 men (13%). Images showing only women were rare (5.9%). Men appeared in 70.5% of images, predominantly showing exclusively men (47%). A sub-group analysis of the “German Congress for Orthopaedics and Traumatology” (DKOU), included 17,420 individuals on 5,377 pictures. Of conference participants, 25,1% were women and 74.7% were mean, whereas among photographed participants, only 20.4% were women (n=3,553) and 79.6% were men (n=13,867).
Interpretation / Conclusion: Our findings reveal an underrepresentation of women on images of German orthopaedic congresses, potentially reinforcing stereotypes and limiting the visibility of female role models in the field. Addressing this imbalance through open conversations and inclusive leadership practices may support gender parity and ensure long-term talent recruitment in orthopaedic surgery.

377. The Calcitonin Receptor-Like Receptor Antagonist Olcegepant Alleviates Collagen Antibody-Induced Arthritis in Mice

Alexander Hildebrandt[1,2,3], Mara Meyer Günderoth[1,2], Jérôme Weber[4], Antonia Schumann[1,2], Tobias Winkler[1,2,5], Georg N. Duda[2], Serafeim Tsitsilonis[1,2], Johannes Keller[6], Tazio Maleitzke[1,2,3,7,8,9]
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Background: Neurogenic inflammation is key driver of chronic pain and cartilage degradation in inflammatory joint diseases. Calcitonin gene-related peptide alpha (αCGRP) is a potent regulator of local neurogenic inflammation, pain and angiogenesis in inflammatory joint diseases.
Aim: To investigate the therapeutic potential of the CGRP receptor antagonist olcegepant/BIBN4096BS in collagen antibody-induced arthritis (CAIA) in mice.
Materials and Methods: On day 0, eighty male C57BL/6J mice were implanted subcutaneously with pellets containing olcegepant (n = 40) or placebo (n = 40). Collagen antibody-induced arthritis (CAIA) was induced on day 5 by an intraperitoneal injection of a monoclonal antibody cocktail (CAIAolcegepant (n = 20); CAIAplacebo (n = 20)) or phosphate-buffered saline (PBS) PBSolcegepant (n = 20); PBSplacebo (n = 20). Body weight, semiquantitative arthritis score, grip strength and ankle diameter were monitored for 15 or 53 days. Inflammation, cartilage degradation and bone erosions were assessed in ankle joints by immunohistochemistry, histology, µCT and gene expression analysis.
Results: Immunostainings from day 15 CAIA animals revealed strong immunoreactivity for the CGRP-receptor in synovium, cartilage, and periosteum. Olcegepant-treated CAIA animals showed significantly reduced clinical arthritis signs. Consistent with these findings, histology and gene expression analysis revealed decreased synovial inflammation and reduced local expression of pro-inflammatory cytokines. Cartilage degradation was attenuated in olcegepant-treated CAIA mice, accompanied by lower expression of cartilage turnover markers. Olcegepant partially reduced osteoclast activity, while overall subchondral bone structure remained unchanged.
Interpretation / Conclusion: Pharmacological blockade of the CGRP-receptor may be a promising, innovative alternative to treat inflammatory joint diseases. Further studies should examine the potential of targeting CGRP in different models while closely monitoring bone quality.

378. Immersive virtual reality simulationbased assessments in orthopedic surgery: a scoping review

Mads Emil Jacobsen[1,2], Rasmus Drews Wenda[3], Mikkel Engell Sandager Nielsen[2], Kristoffer Borbjerg Hare[4], Lars Konge[2], Amandus Gustafsson[2]
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Background: High-quality surgical training is essential for patient safety, efficiency, and accountability. Technical simulation in medical education has been shown to improve patient outcomes and, in some settings, to be more effective than traditional training methods. Immersive virtual reality (iVR) simulators offer an affordable and scalable solution for skills training, and many generate objective performance scores. However, if these scores lack validity evidence, they may misrepresent true surgical competence.
Aim: To critically evaluate the validity evidence supporting iVR-based performance assessment of technical skills in orthopedic surgery.
Materials and Methods: A scoping review was conducted according to PRISMA-ScR guidelines. PubMed and Embase were searched for original studies assessing technical performance in orthopedic iVR simulations. Two reviewers independently screened studies and extracted data. Validity evidence was mapped across five domains of Messick's validity framework (content, response process, internal structure, relations to other variables, and consequences) using the Ghaderi-score. Methodological quality was assessed using the Medical Education Research Study Quality Instrument (MERSQI). Data were synthesized descriptively.
Results: Eighteen studies across eleven procedures were included. Overall, validity evidence was limited and inconsistently reported. Ghaderi scores ranged from 0 to 7 (median 2.5 out of 15), indicating minimal support for score interpretation. Several key aspects of validity were rarely addressed. In contrast, methodological quality was generally high (median MERSQI score 13.5 out of 18).
Interpretation / Conclusion: Current iVR-based assessment scores in orthopedic surgery appear precise but are supported by limited validity evidence. There is a risk that these metrics create a false sense of objectivity and do not adequately reflect true surgical competence. Using such scores for feedback, progression, or certification may therefore be inappropriate at present. Simulation holds clear promise for safer training, but assessment scores must be supported by robust validity evidence before they are used to inform educational or clinical decisions.

379. In-house 3D printed porous implants: does strontium-coating enhance osseointegration? An in-vivo study in large animals.

Anna B. Borgognoni[1], Sarah S. Freund[1], Jørgen Baas[1], Michael M. Bendtsen[1], Jeppe S. Byskov[2], Bahram Ranjkesh[3], Jens R. Nyengaard[4], Ruben Pauwels[3], Klaus P. Almtoft[5], Thomas Baad-Hansen[1]
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Background: Early osseointegration is critical for the success of uncemented orthopaedic implants, particularly in sarcoma patients with compromised bone stock. Strontium surface modification has shown potential to enhance bone formation, but its effect in large-animal gap models remains uncertain.
Aim: To evaluate whether strontium coating enhances early osseointegration and mechanical fixation of in-house 3D-printed porous titanium implants in a large-animal model.
Materials and Methods: Twenty sheep received a porous Ti6Al4V implant in the proximal tibia with a 2 mm circumferential gap. Animals were allocated to either non-coated or strontium-coated implants. After four weeks, specimens were harvested. Mechanical fixation was assessed by axial push-out testing, including shear strength, stiffness, and energy absorption. Histomorphometry quantified bone, fibrous tissue, and membrane formation in defined regions of interest. Data were analysed using non-parametric statistics.
Results: All animals completed follow-up without implant-related complications. Mechanical fixation was similar between groups, with median shear strength 0.08 MPa (IQR 0.10) for non-coated and 0.08 MPa (IQR 0.17) for coated implants. Median stiffness was 0.30 MPa/mm (IQR 0.30) for non-coated and 0.27 MPa/mm (IQR 0.54) for coated implants, and energy absorption 31.0 J/m² (IQR 20.6) for non-coated and 28.5 J/m² (IQR 36.9) for coated implants. Histomorphometry showed comparable bone volume fractions (0.09 (IQR 0.05) vs 0.09 (IQR 0.13)) and fibrous tissue (0.82 (IQR 0.14) vs 0.74 (IQR 0.18)) for non-coated and coated implants, respectively. Surface ongrowth volume fractions was minimal in both groups (non-coated: 0.00 (IQR 0.02); coated: 0.01 (IQR 0.03)). Both groups demonstrated limited bone formation and predominantly fibrous tissue within the gap.
Interpretation / Conclusion: Strontium coating did not enhance early osseointegration or mechanical fixation in this large-animal gap model. The lack of effect may reflect limited local exposure in a non-press-fit environment. Future studies should evaluate strontium coatings under conditions with closer bone–implant contact and longer follow-up.

380. A single intraarticular injection of placental-expanded, mesenchymal-like stromal cells halts progression of experimental primary osteoarthritis

Tazio Maleitzke[1,2,3,4], Sijia Zhou[1,2,5,6], Bin Chen[1,2,5], Marta Grzeski[7], Alexander Hildebrandt[1,2,5,9], Dominik Geisel[8], Florian N. Fleckenstein[8,9], Rene Hägerling[5], Daniela Aschenbrenner[1,2,5], Ioanna Maria Dimitriou[1,5], Christian F. Thudium[10], Michal Sheleg[11], Gilad Kunis[11], Alona Rabner[11], January Weiner 3rd[12], Johanna Bolander[1,5], Oliver Klein[7], Georg N. Duda[1,5], Sven Geissler[1,5], Tobias Winkler[1,2,5]

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Background: Osteoarthritis (OA) is a prevalent degenerative joint disease characterized by inflammation, cartilage degradation, ECM remodeling, and subchondral bone changes. No effective disease-modifying treatment is currently available. PLX-PAD cells exhibit anti-inflammatory, immunomodulatory, and tissue-regenerative properties targeting key OA pathomechanisms.
Aim: To characterize PLX-PAD cells in vitro and ex vivo and evaluate their safety and therapeutic efficacy in the Dunkin Hartley guinea pig model of primary knee OA.
Materials and Methods: PLX-PAD cells were assessed for differentiation capacity, transcriptomic profile, secretome, and immunomodulatory function. Paracrine effects were tested in human OA cartilage explant co-cultures. Six-month-old Dunkin Hartley guinea pigs received a single intra-articular injection of PLX-PAD cells at two doses or vehicle and were followed for 6 months. Outcomes were evaluated using histology, immunostaining, transcriptomics, MALDI-MSI, micro-computed tomography, serum biomarkers, and serial MRI.
Results: PLX-PAD cells showed limited adipogenic and osteogenic differentiation, enhanced immunomodulatory activity after inflammatory stimulation, and shifted human OA cartilage toward a pro-anabolic, anti-catabolic profile. In vivo, PLX-PAD reduced joint inflammation, preserved cartilage structure, and decreased ADAMTS4 and MMP13 at mRNA and protein levels. Transcriptomic and MALDI-MSI analyses indicated modulation of inflammatory and matrix-remodeling pathways, reduced fibronectin fragmentation, and improved ECM peptide signatures. Micro-computed tomography showed reduced subchondral sclerosis and improved trabecular architecture, with greater bone mineral density normalization at the higher dose. MRI detected no treatment-related safety concerns.
Interpretation / Conclusion: PLX-PAD cells exert immunomodulatory and chondroprotective effects in vitro, ex vivo, and in vivo. Intra-articular PLX-PAD attenuated inflammation, preserved cartilage, and improved ECM and subchondral bone remodeling, supporting placenta-derived stromal cell therapy as a promising disease-modifying strategy for OA.

381. Adipose Tissue-Derived Pericytes for the Treatment of Orthopedic Conditions – A Scoping Review

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Background: Adipose tissue-derived pericytes are perivascular stem cells of increasing interest in orthopedics. As progenitors of mesenchymal stem cell (MSCs) they have been reported to have a higher osteogenic differentiation capacity compared to MSCs. Pericytes can be easily isolated from adipose tissue and enriched through microfragmentation or purified using established methods.
Aim: To summarize current knowledge on adipose tissue-derived pericytes in the treatment of orthopedic conditions and to identify key knowledge gaps to guide future hypothesis development.
Materials and Methods: A systematic literature search was performed in PubMed following PRISMA-ScR guidelines. The literature search included human and animal studies, both in vivo and in vitro, investigating the use of identified adipose tissue-derived pericytes to treat orthopedic conditions. Five research questions addressed the reported identity, characteristics, and functionality of these cells in orthopedic regeneration, paracrine signaling, processing methods, and modes and frequency of application.
Results: 381 studies were identified. 42 studies were included (14 in vivo (4 human, 10 animal) and 28 in vitro (24 human and 4 animal)). Pathologies included osteoarthritis (5), osteonecrosis (1), ectopic bone formation (2), non-union fracture (3), spinal fusion (1), rotator cuff tear (1) and Achilles tendon rupture (1). 9 studies treated with a heterogenous cell population including pericytes, 5 studies applied purified pericytes. 12 out of 14 studies identified a positive clinical effect. Pericytes seem to be a promising subpopulation in orthopedics, especially for bone engineering. High heterogeneity in study design was present. Multiple factors may affect the therapeutic performance. Processing of adipose tissue with microfragmentation resulted in a higher pericyte content compared to enzymatic digestion.
Interpretation / Conclusion: Adipose tissue-derived pericytes have shown promising results for the treatment of various orthopedic conditions, especially bone formation. Nevertheless, there is a general lack of level one evidence and high heterogeneity across studies. Greater standardization in future research is needed to enable reliable evaluation of clinical outcomes.

382. Sustained Intra-Articular Antisense Therapy Reduces Cartilage Degradation in Experimental Osteoarthritis

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Background: Osteoarthritis (OA) is characterized by progressive cartilage degradation driven by inflammatory signaling and increased expression of matrix-degrading enzymes. Current intra-articular therapies primarily provide symptomatic relief and do not address underlying disease mechanisms. Localized, sustained suppression of key inflammatory and catabolic pathways may represent a disease-modifying strategy.
Aim: To evaluate the efficacy of sustained intraarticular antisense oligonucleotide (ASO) therapy targeting inflammatory and matrix-degrading mediators in preclinical and translational models of OA.
Materials and Methods: ASOs were formulated in a biodegradable hydrophobic depot enabling prolonged intraarticular release. Efficacy was assessed in the monoiodoacetate (MIA) rat model following a single intra-articular injection. Gene expression in synovium and cartilage was quantified by RT-qPCR and RNA sequencing. Structural outcomes were evaluated by histology (Toluidine Blue O) and serum CTX-II levels. Translational relevance was assessed in a human cartilage explant model exposed to sustained inflammatory stimulation. Cartilage degradation was quantified by exAGNx1 release over 21 days.
Results: In the MIA model, ASO treatment reduced expression of targeted inflammatory and catabolic genes in synovium and cartilage, confirming local target engagement. Histological evaluation demonstrated reduced proteoglycan loss and improved cartilage structural preservation compared with vehicle controls. In human cartilage explants, ASO therapy reduced matrix degradation under inflammatory stimulation, reflected by decreased exAGNx1 release.
Interpretation / Conclusion: Sustained intra-articular ASO therapy reduced inflammatory signaling and cartilage matrix degradation in both rodent and human translational models. These findings support further development of localized nucleic acid therapy as a potential disease-modifying approach in OA.

383. Estrogen deficiency modulates postmenopausal osteoarthritis through reprograming of the subchondral immunometabolism

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Background: Long-term estrogen deficiency is implicated in osteoporotic osteoarthritis, but its impact on osteochondral unit remodeling remains poorly understood.
Aim: This study aimed to investigate how long-term estrogen deficiency affects subchondral bone and articular cartilage remodeling in the context of aging, with a particular focus on osteochondral structural changes and molecular alterations.
Materials and Methods: A long-term ovariectomy (Ovx) model was established in naturally aged rats. Tibial subchondral bone and articular cartilage were evaluated using micro-computed tomography, histological analysis, qRT-PCR, and mRNA sequencing.
Results: Ovx induced a pronounced osteoporotic phenotype in subchondral bone, characterized by reduced bone volume fraction and compromised trabecular architecture. Concurrently, Ovx exacerbated cartilage degeneration, primarily by increasing lesion severity. At the molecular level, Ovx upregulated inflammatory and chemokine mediators, as well as catabolic markers, in both subchondral bone and cartilage. Transcriptomic profiling revealed a coordinated osteochondral immunometabolic shift, with both tissues showing enrichment of lipid-droplet-associated lipid turnover, lipolysis programs, and PPAR/AMPK signaling. These changes indicate the emergence of a lipid-driven, pro-inflammatory microenvironment induced by estrogen deficiency.
Interpretation / Conclusion: Long-term estrogen deficiency acts as a central driver of osteochondral remodeling in aging. Ovx primes subchondral bone and cartilage toward a metabolically and immunologically coupled state, potentially increasing susceptibility to joint degeneration.

384. Characterisation and reporting quality in large animal models on mechanically induced long-bone fractures and fracture-related infections: A scoping review

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Background: Large animal models are common in orthopaedic research for their translational relevance (anatomical, biomechanical, and immunological similarities). The prevalence of mechanically induced fracture models in large animals is unclear. Since clinical fracture characteristics depend on energy transfer, such models may more accurately replicate traumatic conditions and influence experimental outcomes.
Aim: To identify and characterise large animal models of mechanically induced long-bone fractures and fracture-related infection (FRI), focusing on the reporting of key methodological variables, thereby providing a foundation for developing clinically representative models.
Materials and Methods: A scoping review was conducted in accordance with the PRISMA-ScR guidelines. Searches were performed in PubMed, Embase, and Scopus (June 2025). Studies of large animal models of mechanically induced long-bone fractures or FRI were included, excluding osteotomy and non-union models. Extracted data included animal characteristics, fracture and infection details, model performance, and antimicrobial and analgesic use. Reporting quality was assessed using predefined “mandatory” and “highly encouraged” variables central to model development. Reporting was compared before and after the publication of the ARRIVE guidelines, and its association with citation count was examined.
Results: Of 12,987 records, 48 studies were included. Significant model heterogeneity was observed. FRI models were rare (4/48). Dogs predominated, followed by pigs, goats, and sheep. Diaphyseal, transverse fractures induced by bending forces were most common, with external fixation as the primary stabilisation method. Reporting was inconsistent, with several variables reported in fewer than half of the studies. Reporting did not improve after the ARRIVE guidelines were implemented, nor was it associated with citation counts.
Interpretation / Conclusion: Substantial model heterogeneity and limited FRI research were observed. Inconsistent reporting of key methodological variables may hinder reproducibility and translational value. Future efforts should prioritise a minimum reporting standard to enable transparency and support the development of clinically relevant models.

385. Accuracy And Precision Of CT-RSA Migration Measurements Of The TOUCH® Dual Mobility Trapeziometacarpal Prosthesis Compared To MBRSA: An Anatomic Specimen Study

Rianne Oomen[1], Lennard Koster[2], Bart Kaptein[2], Ian Blom[1,3], Gerald Kraan[1], Nina Mathijssen[1]
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Background: In a small joint such as the trapeziometacarpal (TMC) joint, measuring prosthesis migration is still a challenge, especially regarding rotations. The current gold standard is Roentgenstereometric Analysis (RSA), which requires implantation of beads in the bone surrounding the implant. Computed Tomography based RSA (CT-RSA) does not require beads and hence avoids the difficulties that come with bead insertion in small bones. However, CT-RSA has not been validated for migration analysis of the TMC implant.
Aim: To validate CT-RSA to measure migration of a TMC prosthesis and compare it to model-based RSA.
Materials and Methods: A human specimen of the trapezium and first metacarpal (MCP1) bones with an implanted TMC prosthetic, cup and stem, was positioned in a micromanipulator. MCP1 was translated in 9 steps along each of the orthogonal axes up to 2.5mm and rotated in 9 steps around the y-axis of the MTP1 bone up to 5.0°. At each position, a CT-scan was made. After all CT-scans were made, beads were attached to the bone and measurements were repeated with RSA radiographs. All CT-scans and radiographs were analyzed with V3MA and Model-based RSA (MBRSA) software, respectively, to calculate migration of the cup and stem compared to the opposing bone. Measurements were repeated by one analysts one month after the initial analysis to determine intra-observer reliability (ICC), and all measurements were performed by two analysts to determine the inter-observer reliability (IRR).
Results: For translations, accuracy was between -0.017mm and 0.027mm for V3MA and between -0.072mm and 0.034mm for MBRSA. For rotations, accuracy was between -0.112° and -0.027° for V3MA and between -0.612° and 1.707° for MBRSA. Compared to MBRSA, V3MA has better precision with smaller confidence intervals except for the Y-axis rotation of the cup which was 0.063° in V3MA and 0.027° in MBRSA. The ICC and IRR is higher in V3MA compared to MBRSA. The translations had good to excellent ICC and IRR in V3MA. The rotations had poor ICC and IRR in MBRSA and good to excellent ICC and poor to excellent IRR in V3MA.
Interpretation / Conclusion: V3MA is a valid method to measure migration a TMC implant with a better accuracy, precision, ICC and IRR compared to MBRSA.

386. Bursal Acromial Reconstruction (BAR) – Short Term Results with a Porcine Extracellular Matrix Graft

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Background: A prerequisite for a satisfying functional result in the treatment of an irreparable upper rotator cuff rupture is a significant reduction of shoulder pain and better range of motion. Where repair is impossible, the Bursal Acromial Reconstruction (BAR) technique offers a joint-preserving alternative in elderly patients. This method utilizes a biological spacer fixed to the acromion to prevent painful collision between the humeral head and the acromion, providing a stable interpositional graft.
Aim: This is a prospective short-term study to examine the outcome after BAR using a porcine extracellular matrix (ECM) graft. The Primary focus is on the functional outcome and secondarily on radiographical shoulder changes and graft integrity.
Materials and Methods: Patients aged >70 with arthroscopically verified irreparable superior or posterosuperior rotator cuff ruptures and active scaption, were included in the period of March 2023 and March 2025. Patients were evaluated using the Constant score and Western Ontario Rotator Cuff index over a follow-up period of one year. All operated shoulders had magnetic resonance imaging of the injured shoulder after one year with a qualitative radiographic evaluation of graft integrity. Preoperative x-rays and x-rays at one year were classified according to the Hamada classification.
Results: Four patients were operated. At the 12 month follow-up (n=4), the mean Constant score improved from 29 points (range 18–41) preoperatively to 58 points (range 42–65), representing a mean improvement of 100%. The mean WORC index increased from 23 % (range 8%–37%) to 67% (range 35%–98%). 12-month follow-up MRI scans confirmed 100% graft integrity (4 out of 4 grafts) with no progression in Hamada osteoarthritis grades.
Interpretation / Conclusion: Upon completed short term follow-up, all patients (100 %) achieved the MCID for the Constant scores and WORC indices with no deterioration in joint features. There was high satisfaction and no complications. These findings suggest that BAR is a relevant treatment to reverse shoulder arthroplasty in this subgroup of patients.