



Annual Report

Research Activity 2024



Division of Orthopaedic Surgery

University of Oslo, Diakonhjemmet Hospital
and Oslo University Hospital





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Introduction

Oslo University Hospital and the University of Oslo

Oslo University Hospital (OUH) is Norway's largest hospital with over 24 000 employees and a budget of 23 billion NOK. The Hospital has a local function for parts of Oslo's population. It has a regional function for the inhabitants in the South-Eastern Norway Regional Health Authority, and it also has a large number of national functions. The Hospital is responsible for the majority of medical research and education of health personnel in Norway.

The University of Oslo (UiO) is Norway's largest research and educational institution with 28 000 students and 7000 employees. Professional breadth and internationally recognized research environments make UiO an important contributor to society. The Faculty of Medicine was established in 1814 and works for progressive education, research and dissemination for the patients' and society's best interests.

Diakonhjemmet Hospital

The research activity of Department of Rheumatology at Diakonhjemmet Hospital is organizationally linked to Division of Orthopaedics.

Diakonhjemmet Hospital is a private, non-profit hospital with defined responsibilities for the health care system both in Oslo, in the health region as well as nationally. Department of Rheumatology has responsibility for people with rheumatic joint diseases living in the entire area of Oslo and a regional function for the inhabitants in the South-Eastern Norway Regional Health Authority. Two national highly specialized functions are located at the Hospital: The Norwegian National Unit for Rehabilitation for Rheumatic Patients with Special Needs and the Norwegian National Advisory Unit on Rehabilitation in Rheumatology.

The Department has since 2008 held the position as EULAR Center of Excellence and has in addition to patient care a strong focus on clinical and epidemiological research, education and information to patients and their relatives. Three professors; Espen A. Haavardsholm, Hilde Berner Hammer and Tillmann Uhlig, have combined positions in the Department of Rheumatology and University of Oslo.

From Division Director Wender Figved

Being the largest hospital in Norway, Oslo University Hospital provides highly specialized health care services to the citizens of Oslo and the South-East Health Region. In addition, the Hospital has a nationwide responsibility for a number of national and multi-regional assignments. The Division of Orthopaedics (OPK) is one of 16 medical divisions. It encompasses the fields of orthopaedic traumatology, hand surgery including retransplant surgery, prosthetic surgery, oncology surgery, spinal surgery, scoliosis surgery, pediatric surgery and arthroscopic surgery.





The proximity to patients and their medical issues are the cornerstones for the research conducted at our Division, which is aimed at improving patient care. High ethical standards ensure the confidentiality, and our goal is to continuously improve diagnostics, treatment and management for all our patients.

Research activity

OPK's research activity is organized into 9 different research groups covering a broad range of basic and clinical research with an overall aim to improve patient care with emphasis on diagnostic, therapeutic and preventive measures. Most group leaders have a combined position at Oslo University Hospital and the University of Oslo. In total, the Division has 9 Professors, 4 Associate Professors, postdoctoral fellowships, several PhD students and administrative and technical staff.

The Division has an Advisory Research Board which in 2024 consisted of: Professor Lars Nordsletten, Professor Jan Erik Madsen, Professor Inger Holm, Professor Magne Røkkum, Professor May Arna Risberg, Professor Stephan Röhr, Associate Professor Joachim Horn, Associate Professor Thomas Kibsgård, Associate Professor Gilbert Moatshe, Associate Professor Ida M. Bredesen and Head of FoU Tone Bere.

In 2024 OPK had a total of 67 registered peer reviewed publications and 5 PhD dissertations.

Diakonhjemmet's department of Rheumatology registered 40 publications in the same period.

Lars Nordsletten





Osteoarthritis Research Group

Group Leader

Lars Nordsletten, Prof, Division of Orthopaedics, UiO (lars.nordsletten@medisin.uio.no) / Head of R & D, Division of Orthopaedic Surgery, OUH (UXLANO@ous-hf.no)



Group Members

- May Arna Risberg, Professor
- Tore K. Kvien, Professor em
- Till Uhlig, Professor
- Inger Holm, Professor
- Ida K. Haugen, Senior researcher
- Kristin Bølstad, Research coordinator
- Nina Østerås, Professor
- Britt Elin Øyestad, Professor
- Nina J. Kise, Post Doc
- Sonia Rojewski, Phd fellow
- Bjørnar Berg, PostDoc
- Anouk Urhaus,
- Tuva Moseng, post doc
- Pernille Steen Pettersen, post doc
- Alexander Mathiessen, post doc
- Marthe Gløersen, PhD candidate
- Elisabeth Mulrooney, PhD candidate
- Heidi Gammelsrud, Research coordinator
- Elise Berg Vesterhus, Research coordinator
- Ida Marie Bredesen, Assisting professor

Research profile and aims

To study the etiology, treatment and prevention of osteoarthritis (OA). We are primarily studying knee, hip and hand OA.





Ongoing projects

- Training in knee OA: RCT between different training forms
- Risk factors for OA in hip, knee and hand: HUNT-NLR-OUH study and Ullensaker study
- Development of hand OA
- AktivA: implementation of treatment and prevention and registry of OA in primary care in Norway
- OMEX: RCT between traing and operation in meniscal injury
- ArtroVax: The immunological impact on OA development
- HIPARTI: Hip arthroscopy vs training
- Nor-Hand: Observational study of persons with hand OA
- MERINO: RCT studying the efficacy and safety of methotrexate in erosive hand OA
- The development of EULAR classification criteria for hand OA
- Delaware- Oslo ACL Cohort
- PICASSO trial

Most important national and international collaborators

National

- The Norwegian Arthroplasty Register
- The Norwegian Cruciate Ligament Register
- The Norwegian Hip Fracture Register
- NTNU, HUNT Research Center
- FHI

International

- David T. Felson, Boston University, USA
- Martin Englund, Lund University, Sweden
- Lynn Snyder-Mackler, University of Delaware, USA
- Tuhina Neogi, Boston University, USA

Funding

- South-Eastern Norway Regional Health Authority
- Norwegian Extra Foundation fr Health and Rehabilitation
- The Research Council of Norway
- Foundation of Sophies Minde
- Dr Trygve Gythfeldt and wife's Research Foundation
- Pahle's Foundation
- Simon Fougner Hartmann's Family Foundation
- Pfizer: Global Awards for Advancing Chronic Pain Research (ADVANCE)
- Remedy





Scientific production of the research group in 2024

Peer reviewed original research articles: 32

Selected publications:

Urhausen, A. P., H. Grindem, L. Engebretsen, K. Gravare Silbernagel, M. J. Axe, L. Snyder-Mackler, and M. A. Risberg. 2024. 'The Delaware-Oslo ACL Cohort treatment algorithm yields superior outcomes to usual care 9-12 years after anterior cruciate ligament reconstruction', *Knee Surg Sports Traumatol Arthrosc*, 32: 214-22

Hannani, M. T., C. S. Thudium, A. C. Gellhorn, J. Larkin, M. A. Karsdal, Z. Lisowska-Petersen, P. Frederiksen, C. L. Bager, C. Ladel, A. Struglics, M. Uebelhoer, Y. Henrotin, A. R. Bihlet, F. J. Blanco, I. K. Haugen, M. Kloppenburg, F. Berenbaum, A. Mobasheri, J. Bacardit, and A. C. Bay-Jensen. 2025. 'Longitudinal stability of molecular endotypes of knee osteoarthritis patients', *Osteoarthritis Cartilage*, 33: 166-75

Osteras, N., E. Aas, T. Moseng, L. van Bodegom-Vos, K. Dziedzic, B. Natvig, J. H. Rotterud, T. V. Vlieland, O. Furnes, A. M. Fenstad, and K. B. Hagen. 2024. 'Longer-term quality of care, effectiveness, and cost-effectiveness of implementing a model of care for osteoarthritis: A cluster-randomized controlled trial', *Osteoarthritis Cartilage*, 32: 108-19

Dissertations

Anouk Urhausen

Marthe Gløersen





Pediatric Orthopaedics



Group Leader

Joachim Horn, Associate Professor, Section of Children's Orthopaedics and Reconstructive Surgery, UiO (joachhor@medisin.uio.no) /OUH (jhorn@ous-hf.no)

Group Members

- Terje Terjesen, Professor emeritus, UiO
- Harald Steen, MD/PhD, OUH
- Ola Wiig, MD/PhD, OUH
- Stefan Huhnstock, MD/PhD, OUH
- Anders Wensaas, MD/PhD, OUH
- Anne Berg Breen, MD, PhD-candidate, OUH
- Anders Grønseth, MD, PhD-candidate, OUH
- Andreas Knaus, MD, OUH
- Thilini Gamage
- Johan Brevik, PT
- Anne Marthe Svendsen Rysst-Heilmann, PT
- Sanyalak Niratiarak, PhD, Head engineer, UiO

Research profile and aims

The main intention of the group is to promote clinical and experimental research within the field of children's orthopaedics and reconstructive surgery. Core areas of research are: rare bone diseases, limb deformity (limb lengthening and growth modulation) and children's hip (Perthes, DDH and SCFE). A Novel areas of research is: mixed reality/holographic technology within the field of orthopaedics.

Ongoing projects

1. Rare bone diseases

Establishment of a "Norwegian Skeletal Dysplasia Register" in collaboration with the Norwegian National Advisory Unit on Rare Diseases, Department of Medical Genetics and Pediatric Endocrinology. The register will be a base for broad interdisciplinary research within this field. (Joachim Horn)

"The use of gait analysis in skeletal dysplasia – a literature review", in collaboration with ERN BOND (European Reference Network for Rare Bone Disorders) (Joachim Horn)





“Orthopaedic clinical decision making in skeletal dysplasia – a survey among ERN BOND and EPOS members” (Thilini Gamage, Joachim Horn)

Long term consequences of rare bone diseases – 1-2 scoping reviews (Thilini Gamage, Joachim Horn)

2. Limb lengthening and reconstruction (Joachim Horn)

“Growth modulation in correction of leg length and axial deviations”; PhD project, Anne Berg Breen

- The timing of percutaneous epiphysiodesis for leg length discrepancy – an evaluation of four different prediction methods
- A comparison of 3 different methods for assessment of skeletal age when treating leg length discrepancies: An inter- and intra-observer study
- Comparison of Different Bone Age Methods and Chronological Age in Calculation of Remaining Growth Around the Knee
- Angular deformities after percutaneous epiphysiodesis for leg length discrepancy

“Idiopathic increased femoral anteversion”; PhD project Anders Grønseth

- “Derotational osteotomy in the femur with either percutaneous osteotomy and intramedullary nailing or with an open approach and plating – a randomized controlled trial”
- “Three-dimensional gait analysis before and after derotational osteotomy in patients with idiopathic increased femoral anteversion”
- “Long-term follow-up of untreated patients with increased femoral anteversion”
- “Larger Core Locking Bolts Enhance Precision in Intramedullary Nailing for Femoral Derotational Osteotomies: A Biomechanical Study”

3. Children’s hip

“A nationwide Perthes study – a long term follow-up with more than 20 years” (Stefan Huhnstock)

4. Mixed Reality, Holographic technology (Ola Wiig)

“OrthoNav-mixed reality/holographic technology in orthopaedic surgery”, PhD project Inger Gruenbeck, MSc, The Intervention Centre, OUH (Ola Wiig)

“gAlt” AI based treatment and diagnostic support for gait evaluation in children with cerebral palsy, Eirik Gromholdt Homlong, Institutt for Informatikk.” (Ola Wiig)





Most important national and international collaborators

National

- Lena Lande Wekre, MD, PhD, Norwegian National Advisory Unit on Rare Diseases
- Cecilie Rustad, MD, Dept. of Medical Genetics, OUH
- Cathrine Alsaker Heier, Div. of Pediatrics, Endocrinology
- The Intervention Centre, OUH

International

- EPOS Study Group
Genetics and Metabolic Diseases
- International Perthes Study Group
- European Reference Network for rare Bone Disorders (ERN BOND)
- Nordic Limb Lengthening and Reconstruction Society

Scientific production of the research group in 2024

Selected publications:

Casareto L, Appelman-Dijkstra NM, Brandi ML, Chapurlat R, Cormier-Daire V, Hamdy NAT, Heath KE, Horn J, Mantovani G, Mohnike K, Sousa SB, Travessa A, Wekre LL, Zillikens MC, Sangiorgi L; Eur J. Med Genet. 2024 Jan 29;104916. doi: 10.1016/j.ejmg.2024.104916. Epub ahead of print. PMID: 38296035

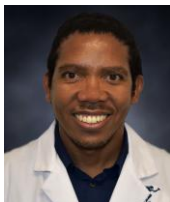
Radler C, Calder P, Eidelman M, Horn J, Kold S, Langendörfer M, Manner HM, Sedki I, Vogt B. J Child Orthop. 2024 Jun 12;18(4):349-359. doi: 10.1177/18632521241258351.

Breen AB, Steen H, Pripp A, Niratisairak S, Horn J. J Bone Joint Surg Am. 2024 Jul 25. doi: 10.2106/JBJS.23.01483. Epub ahead of print. PMID: 39052759





Biomechanics Laboratory



Group Leader

Gilbert Moatshe, MD/PhD, Head of Biomechanics Laboratory/Consultant
Orthopaedic Surgeon, Orthopaedic Division, OUH, Associate Professor UiO
(gilbert.moatshe@medisin.uio.no)

Group members

- Sanyalak Niratisairak, PhD, Lab's Head engineer, UiO
- Lars Nordsletten, MD/PhD, Professor, OUH
- Jan Egil Brattgjerd, MD/PhD, OUH
- Endre Søreide, MD/PhD, OUH
- Jan Rune Nilssen, Eng, Norwegian Defence Research Institute (FFI)
- Kristin Jørgensen, MD, OUH
- Ingrid Skaaret, CPO/MSc/PhD, Sophies Minde Ortopedi AS (SMO)/OMU
- Anne Berg Breen, MD/PhD-cand, OUH
- Bryan Wright, MD/PhD-cand, Ringerike Hospital
- Marek Zegzdryn, MD/PhD cand, Arendal Hospital
- Hannah Jahr, MD/PhD cand, Arendal Hospital
- Kaare Midtgaard, MD/PhD cand, OUH

Associate group members

- Joachim Horn, MD/PhD, OUH/UiO
- Are Hugo Pripp, MSc/PhD, OUH, prof OMU
- Are Stødle, PD/PhD, OUH

Research profile and aims

Biomechanics lab at the Department for Research and Development, OUH Orthopaedic Clinic, functions as a service-unit and contributes as a facilitator/catalysator for accomplishment of various research projects within the orthopaedic community in the Oslo region. The laboratory was established back in the 1960'ies as a joint venture between Sophies Minde National Orthopaedic Hospital and UiO with 1.5 full time employees: One orthopaedic surgeon (50%) employed by the Hospital, and one Engineer (100%) employed by the UiO.

The laboratory previously organized the meetings of the 'Biomechanics Forum' 2-3 times a year during the periods 1996-2002 and 2013-2017, with a total of 31 meetings. 'Biomechanics Forum' was a multidisciplinary discussion group of professionals and students. The plan was to establish a new national forum called the 'Norwegian Biomechanics Society' (NBS) consistent with similar existing national societies in Denmark and Sweden, and with a future expectation of making a common Scandinavian





Biomechanics Society. However, due to the Covid-19 pandemic the inauguration of the NSB has been postponed in 2020 and 2021.

The laboratory is furnished with technological equipment for mechanical and functional testing, and participates in planning, execution, analyses, and publishing of clinical and experimental studies.

Biomechanics lab was granted 1.37 mill NOK from the Hospital's Investment budget 2019 for upgrading of our mechanical testing machine (MTS, MiniBionix 858), located at the Institute for Surgical Research. The new equipment will be a high-speed digital image video camera with integrated 3D motion analysis for detailed documentation of the deformation process within the test object during mechanical testing. The procurement process started in September 2019, but was delayed by the Covid pandemic.

In daily clinical activity the Biomechanics lab has been part of the Paediatric Orthopaedics and Reconstructive Surgery Section at Rikshospitalet, mainly contributing with preoperative assessment of patients with limb length discrepancy and other deformities, and monitoring of patients operated with distraction osteogenesis/callotasis by use of external fixators or operated with epiphysiodesis. The biomechanical lab also performs studies related to implants used in orthopaedic surgery, ligament reconstruction and fracture fixation.

Ongoing projects

- Comparison of various methods for bone age assessment (ABB/PhD Thesis in progress)
- Time planning and treatment of epiphysiodesis - Outcome of various methods (ABB/PhD Thesis in progress)
- Biomechanical studies of bone fixation (BW/PhD Thesis in progress)
- Fixation of trochanteric fractures with gliding screw and plate
- Reconstruction of anterior cruciate ligament with both tibial and femoral fixation (PhD Project)
- Comparison of suture tape to metal wire for tension band in olecranon fractures (PhD Project)
- Comparison of open and arthroscopic fixation of tendon transfer for massive rotator cuff tears
- Fixation of femoral derotation osteotomies with an intramedullary nail
- Testing of a new instrument for balancing medial collateral ligament in knee prosthetic surgery (PhD Project)
- Radiostereometric (RSA) Growth-Analyses after (Hemi-)Epiphysiodeses
- Forces, Load-share and Strain in Ankle Arthrodiastasis
- Forces, Load-Share and Strain during the Callotasis Process
- The Birch Classification for Congenital Fibular Deficiency Can Predict Treatment Modality and Clinical Outcome in Young Adults Born With Lower-Limb Deficiencies





- The Influence of an Intact or Healed Osteotomized Fibula on the Measured Load-Share Value after a Tibial Lengthening Osteotomy - A Cadaver Pilot Study

Most important national and international collaborators

National

- Jan Rune Nilssen, Norwegian Defence Research Establishment, Kjeller: Mechanical testing projects
- Bryan Wright, MD, Ringerike Hospital: Mechanical properties and bone mineral parameters per-trochanteric femoral fractures
- Hanna Jahr, MD, Arendal Hospital: Comparison of open and arthroscopic fixation of tendon transfer in massive rotator cuff tears
- Marek Zegzdryn, MD, Arendal Hospital: Reconstruction of anterior cruciate ligament with both tibial and femoral fixation
- Arne Kristian Aune, MD/PhD, Aleris Private Hospital: Reconstruction of anterior cruciate ligament with both tibial and femoral fixation

International

- William MacKenzie, MD and Tariq Rahman, PhD, Neumors, Alfred I. duPont Hospital for Children, Wilmington, Delaware, USA: Experimental limb lengthening project
- Søren Kold, MD/PhD and Markus Winther Frost, Aalborg University Hospital, Denmark: Experimental limb lengthening project
- Stephen Grigg, PhD and Rhys Pullin, PhD, Cardiff School of Engineering, Cardiff University, UK
- Acoustic Emission Project

Scientific production of the research group in 2024

Peer reviewed original research articles: 16

Selected publications:

1. Alm CE, Karlsten A, Madsen JE, Nordsletten L, Brattgjerd JE, Pripp AH, Frihagen F, Röhrli SM. No benefit of the trochanteric stabilizing plate on loss of fracture reduction in AO/OTA 31-A2 trochanteric fractures. Bone Jt Open. 2024 Jan 19;5(1):37-45. doi: 10.1302/2633-1462.51.BJO-2023-0082.R1. PMID: 38240179; PMCID: PMC10797560.

2. Husebye EE, Andreassen GS, Stødle AH. Gunshot Injury With Bone Defect of the First Metatarsal Bone A Presentation of 2 Cases Treated With an Iliac Crest Structural Graft, Internal Fixation, and Bone Morphogenic Protein 2. Foot Ankle Spec. 2024 Sep 18:19386400241278026. doi: 10.1177/19386400241278026. Epub ahead of print. PMID: 39292490.





3. Breen AB, Steen H, Pripp A, Niratisairak S, Horn J. Accuracy of 4 Different Methods for Estimation of Remaining Growth and Timing of Epiphysiodesis. J Bone Joint Surg Am. 2024 Oct 16;106(20):1888-1894. doi: 10.2106/JBJS.23.01483. Epub 2024 Jul 25. PMID: 39052759





Center for Implant and Radiostereometric Research Oslo

Group Leader



Stephan M. Röhrli, MD, PhD, senior consultant surgeon
(s.m.rohrl@medisin.uio.no) Division of Orthopaedic Surgery, OUH, Board
member of the Norwegian arthroplasty Registry, (UXRHST@ous-hf.no), Vice
president of the International Radiostereometry Society; RSA

Social media: homepage: CIRRO.no Instagram: Cirro_norway

Group Members

Senior members:

- Lars Nordsletten, Professor, OUH
- Anselm Schultz, MD, PhD, OUH
- Vera Halvorsen, MD, OUH
- Marianne Westberg MDT/PhD, OUH
- Lene Solberg, MD/PhD, OUH
- Jan Egil Brattgjerd, MD/PhD, Oslo Met

Alumni (PhD):

- Wender Figwed, MD/PhD Bærum Hospital (2010)
- Berte Bøe, MD/PhD, OUH (2012)
- Einar Lindalen, MD/PhD Lovisenberg Hospital (2013)
- Jon Dahl, MD/PhD, OUH (2014)
- Thomas Kibsgård, MD/PhD, UiO and OUH (2014)
- Bernhard Flatøy, MD/PhD, Diakonhjemmet hospital (2018)
- Eirik Aunan, MD, Lillehammer hospital (2019)
- Justin van Leeuwen, MD, Helse Førde Lerdal Hospital (2019)
- Gunnar Petursson, MD, Lovisenberg Hospital (2019)
- Ole-Christian Brun, MD, Lovisenberg Hospital (2021)
- Frank David Ørn, MD, Kristiansund Hospital (2022)
- Peder Thoen, MD, Tønsberg Hospital (2022)
- Alexander Fraser, MD, Diakonhjemmet hospital (2023)
- Yasser Rehman, MD, Lovisenberg Hospital (2024)
- Engelke Randers, MD, OUH (2024)

PhD candidates:

- Carl Erik Alm, MD, OUH
- Vinjar Brenna Hansen, MD, OUH
- Lars Engseth, MD, OUH
- Magnus Poulsen, MD, OUH
- Wilhelm Johan Mustad, MD, OUH
- Dan Sandbæk, Kallnes sykehus





Group Members (continued)

Single project candidate:

- Magnus Høgevold, MD, Diakonhjemmet Hospital
- Trygve Glad, Rikshospitalet, MD, OUH
- Fredrik Bru, Kristiansund hospital
- Mathias Brevik, Kristiansund hospital
- Henrik Friedheim, OUH
- Ingvild Bjåland Østerhus, Diakonhjemmet hospital
- Mohammad Ballo, OUH
- Torben Janssen

Students:

- Anine Karsen, UiO
- Nadia Iranoust, UiO

Research profile and aims

The overall aim of CIRRO is to perform sophisticated basic and clinical research in the field of orthopaedic surgery, imaging science and bone turnover, establish a team of dedicated researchers and collaborate nationally and internationally. Our intention is outlined at: <http://ous-research.no/home/cirro/Aboutus/11138>

- To use and develop precise measurement methods in musculoskeletal research
- To study new treatment options (implants, surgical techniques, biotechnology, rehabilitation interventions and pharmacological treatment) and to ensure safe treatment to patients
- To study disease development (cartilage wear, bone loss, changes in body composition) together with other methods, in order to gain insight into mechanisms for disease and eventual treatment.
- To further develop CIRRO as a main research centre delivering sophisticated services to researchers in South-Eastern Norway Regional Health Authority and adjoint hospitals, nationally as well as internationally.



Ongoing studies in 2024

Indication and Treatment of adult Kyphoscoliosis (INTRAKS study)

1 – years controls are finished, and 2- years controls are ongoing.

Our collaborator associate professor Bungo Otsuki from Kyoto university visited for discussion of the project.

For more comprehensive information about the study:

<https://www.intraks.org/>



NaKiD knee study

This study of PhD candidate Lars H. Engseth has now finished inclusion of all patients. The results of the last project on the migration of cementless knees was presented at the annual orthopaedic meeting in Norway.



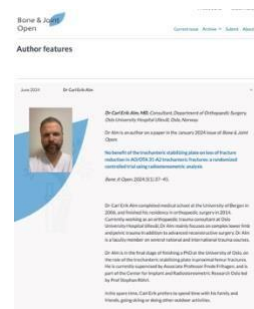
Lisfranc study

The ongoing CT-based study of Magnus Poulsen in diagnostics of Lisfranc injuries included 38 patients in 2024. 1 – years controls are ongoing and will be finished by april 2025. For more information please have a look at the studies homepage: [Lisfrancstudien](#)



Trochanteric Stabilizing Plate in Pertrochanteric fractures

PhD candidate Carl Erik Alm published his last article in his PhD program and was awarded with the author of the month title in British Joint Journal open. He is now focusing on the summary of the thesis.



Kinematics in Total Knee Arthroplasty

We reach out to our colleagues in Århus for the possibility of using automated RSA for the analysis of our kinematic data on the Medacta knee prosthesis. Formalities and REC have to be organized. PhD candidate Fredrik Bru joined the team for this project. This is a project in collaboration with Ortoforsk- KS (Kristiansund with Frank-David Øhrn)



Investigation of the stability of hand arthroplasties (INSTHA – trial)

Wilhelm Johan Mustad completed all regulatory work to start with his clinical studies TWIST-study and StableTouch (CMC1 arthroplasty). We also visited the joint registry in Bergen (Yngvar Krukhaug and Geir Hellan) as a start off meeting for the planned registry study on wrist arthroplasties.



Surgical treatment of pelvic girdle pain

PhD candidate Engelke Randers from the spinal unit focuses on writing the summary of her PhD thesis on pelvic girdle pain.



Cless TKA

The first 1 year results were published of the 3D printed medial pivoting TKA study. Frank-David Øhrn and Prof. Otto Schnell Husby are satisfied with the clinical outcome. Fredrik Bru wrote several applications for a PhD position.



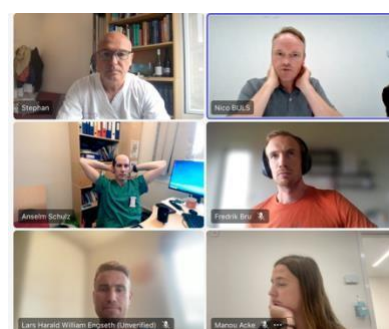
Dual Mobility cups – A lasting solution for dislocations?

Mathias Brevik is a new PhD student from Kristiansund who evaluates Dual mobility cups in his planned PhD study. This is a collaboration project with Kristiansund and the Norwegian implant registry.



AI solution for CT-RSA

Collaboration with Brüssel university to develop a AI solution for CT-RSA. First project is a precision study on a porcine cadaver. This is part of a PhD project of Amou Acke at Brüssel university hospital.





Other activities

World arthroplasty congress, Madrid, Spain, April 2024.

Stephan M. Röhrl held a talk about the longest HXLPE RSA study (E-poly) study in the world.



“Two medical students Charlotte Prager and Lina Christiansen from Germany had a 4 - week **internship** at the ortopedic department”.

IRSA online meeting in June 2024 held a talk by Frank David Øhrn, MD, PhD, about experiments with different doses for CT-RSA on a phantom.

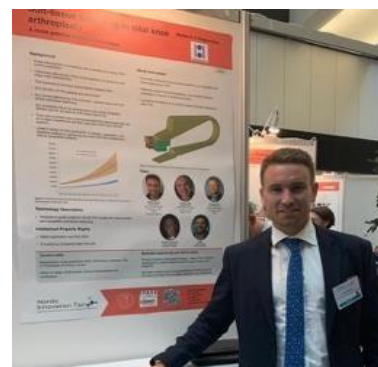


Prof. Stephan M. Röhrl visited Kyoto university hospital, to meet with Prof. Matsuda regarding the INTRAKS project. Dr. Shima is helping to collect the missing data. He also visited former CIRRO fellow Masako Kano, head of the department at Shiba childrens hospital, Japan.



Nordic Innovation Fair

Dr. Lars Engseth presented his innovative ligament balancing tool at the international Innovation Fair in Copenhagen, Denmark.



First OrtoForsk-KSU meeting

Impressive first OrtoForsk meeting in Kristiansund. Interesting collaboration and projects on robot assisted surgery in TKA and on Dual mobility hips. Supervisor meeting with PhD student Mathias Brevik from Kristiansund. Dr. Frank David Øhrn has built up a great research team!



Annual Norwegian orthopedic meeting:

CIRRO presentors:

Lars Engseth: Migration analysis of the tibia implant with CT-RSA compared with RSA.

Frank David-Øhrn: Precision of CT – based RSA on femoral migration in total knee arthroplasty: A porcine cadaver study.

Lene Bergendal Solberg: Total hofte protese hos pasienter med Morquio syndrom

Marianne Westberg: Forekomst og utfall av uventet oppvekst ved aseptiske revisjoner av hofte og kneproteser

Ingvild Bjåland Østerhus: Diagnostics of painful implants with CT-RSA.

Ingvild Østerhus won the price for the Charnely Stipend at NOF 2025 and Marianne Westberg the price for best paper within hip and knee arthroplasty!



Kleivstua 2024:

Reviewers from Denmark: Maiken Stilling and Sweden: Maziar Mohaddes.



2 presenters from CIRRO:

- *Fredrik Bru*
- *Henrik Fridheim*



Ongoing projects an overview

Hip projects

- RCT on the function of the Trochanteric Support Plate (TSP) in combination with the Dynamic Hip Screw (DHS)
- Long time performance of Vit E infused poly in THP with different head sizes
- Dual Mobility cups. A lasting solution for hip dislocations

Knee projects

- In vivo kinematics and performance of contemporary knee arthroplasty (PhD project OUH, in collaboration with HF Møre Romsdal)
- Kinematic RSA of three different kneedesigns (collaboration with Lovisenberg Hospital)

Methodological projects

- Motionanalysis with CTMA and IMA in the forefoot and the IS joint (part of the PhD projects)
- Precision of CTMA in the knee in collaboration with Kristiansund and the Radiology departments at OUH
- Experimental studies on CT-RSA with a phantom on dose reduction and precision

Ankle and foot projects

- Investigating acute Lisfranc injuries in the foot and a new surgical procedure (PhD project OUH)
- Kinematics of the midfoot after Lisfranc injury (PhD project OUH)

Hand project

- A prospective randomized trial comparing two different wrist arthroplasties (PhD project OUH)
- New diagnostics for loose implants in the hand
- Register study for wrist implants

Spinal project

- INTRAKS study on spinal deformities (<https://www.intraks.org>)
- Surgical treatment of pelvic girdle pain



Shoulder project

- Which position should be applied for diagnostic CT-RSA? (PhD project OUH)
- New diagnostics for loose implants in the shoulder
- Long time follow up reverse shoulder arthroplasty

Elbow project

- Safety and long time outcome of surgical treatment of distal humerus fracture

Most important national and international collaborators

National

- Norwegian Arthroplasty register (NAR)
- Kristiansund hospital (Ortoforsk –KS)
- Diakonhjemmet Hospital
- Lovisenberg Diaconal Hospital
- Regional Health Authority Møre Romsdal
- Haukeland University Hospital
- National register for leddproteser

International

- Leiden University, The Netherlands
- Kyoto University Orthopaedic Association, Japan
- Skåne University, Sweden
- SECTRA, Sweden
- UmRSA Biomedical, Sweden
- Brüssel university, Belgium
- Århus university, Denmark

Scientific production of the research group in 2024

Dissertations:

On April 5th 2024 Yasser Rehman conducted his PhD defence on the topic: The impact of implant design and severity of knee osteoarthritis on clinical outcome after total knee arthroplasty.





Peer reviewed original research articles: 5

Selected publications:

Kaptein BL, Pijls B, Koster L, Kärrholm J, Hull M, Niesen A, Heesterbeek P, Callary S, Teeter M, Gascoyne T, Röhrl SM, Flivik G, Bragonzoni L, Laende E, Sandberg O, Solomon LB, Nelissen R, Stilling M (2024)

Guideline for RSA and CT-RSA implant migration measurements: an update of standardizations and recommendations Acta Orthop, 95, 256-267

Funding

- South-Eastern Norway Regional Health Authority (PhD program)
- NTNU
- Møre Romsdal Health Authority (PhD program)
- Medacta International AG
- Sophies Minde Health Fund (PhD program)
- The Research Council of Norway
- Health fund of western Norway (PhD program)



Hand



Group Leader

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- Andreas Lødrup, MD, RH
- Lars-Eldar Myrseth, MD, RH
- Hrönn Olafsdóttir, MD, RH
- Ole-Gunnar Olsen, MD, RH
- Helle Sundnes Reiten, PT/MSc, RH
- Kristine Risum, PT/PhD, RH
- Carina Paulsen Rosales, OT/MSc, Aker
- Astrid Rosenberg, MD, Aker
- Anne-Mari Nissen Rosenlund, MD, Aker
- Anne Birgit Stavenes, OT, RH
- Endre Søreide, MD/PhD, Aker
- Audun Høegh Tangerud, MD, Aker
- Rasmus Thorkildsen, MD/PhD, RH
- Frode Thu, MD, RH
- Tone Vaksvik, OT/PhD, RH
- Anders Heyerdahl Valeur, PT/MSc, RH
- Mona Winge, MD, RH

Research profile and aims

Clinical research related to hand, micro-, and peripheral nerve surgery and therapy.

Ongoing PhD projects

- Lødrup A: Neurovascular injuries due to paediatric elbow and forearm fractures
- Olsen OG: Early discovery of ischemia after replantation surgery



- Reiten HS: Shoulder function, activity, and patient-reported outcomes after surgery and rehabilitation in children and adolescents with obstetrical brachial plexus palsy
- Thu F : Brachial plexus injuries

PhD projects in planning

- Olafsdottir H: Challenges in Microsurgery: Postoperative surveillance of circulation, prognostic factors for tissue survival and patient-reported outcomes

Other ongoing projects

- Glad TH: Prospective follow-up of wrist replacements
- Glad TH: Long-term results after wrist replacements: Outcomes after 5 years in a randomized controlled trial
- Rosales C: Clinician- and patient-reported outcomes after flexor tendon repair: A 1-year prospective study
- Rosenberg A: Hand injuries
- Sletten IN: Conservative treatment or early prophylactic excision of osteochondromas in the distal ulna in patients with hereditary multiple osteochondromas – a multicenter comparative cohort study
- Tangerud A: Distal radius fractures in patients over 65 years: Outcomes after 3 and 5 years of a randomized controlled trial
- Tangerud A: CROFT 2/ Conservative or operative treatment of olecranon fractures
- Thorkildsen R: Prospective follow-up of trapeziometacarpal joint replacements
- Thorkildsen R: Contraceptive implants: Depth of placement in patients referred to a hand unit
- Vaksvik T: International validation of Children's Hand use Questionnaire
- Vaksvik T: Recovery 6 and 12 months after digital nerve repair in complex hand injuries
- Vaksvik T: Occupational therapy treatment strategies in patients after thumb amputation





Most important national and international collaborators

National

- Dept. of Otorhinolaryngology, Head and Neck Surgery, OUH
- Dept. of Plastic Surgery, OUH
- The Norwegian Institute of Public Health
- Sensocure AS

International

- Sahlgrenska University Hospital, Sweden
- Tampere University Hospital, Finland
- Södersjukhuset, Sweden
- Copenhagen University Hospital, Denmark
- Wilhelmstift Catholic Children's Hospital, Germany
- CoULD research group, USA
- Örebro University Hospital, Sweden

Scientific production of the research group in 2024

Master theses: 2

Peer reviewed original research articles: 8

Selected publications:

Eriksen BK, Vaksvik T. Activity limitations related to cold hypersensitivity in patients with hand injuries. J Hand Ther. 2024 Oct-Dec;37(4):544-554. doi: 10.1016/j.jht.2024.02.008. Epub 2024 Jun 27. PMID: 38942657.

Thorkildsen RD, Kleggetveit IP, Thu F, Madsen LM, Bolstad BJ, Røkkum M. Supercharging of the ulnar nerve: clinical and neurophysiological assessment at 2 years for nine proximal injuries. J Hand Surg Eur Vol. 2024 oct;49(9):1139-1146. doi: 10.1177/17531934231226174. Epub 2024 Jan 18. PMID: 38235708.

Sletten IN, Jokihaara J, Klungsøyr K. Prevalence, infant outcomes and gestational risk factors for transverse reduction deficiencies at or above the wrist: a population-based study. J Hand Surg Eur Vol. 2025 Jan; 50(1):94-102. doi: 10.1177/17531934241249913. Epub 2024 May 23. PMID: 38780050; PMCID: PMC11699704.

Funding

- UiO
- OUH
- Sophies Minde Ortopedi AS
- Norwegian Physiotherapist Association



Orthopaedic traumatology



Group Leader

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Senior Group Members

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- Sigbjørn Dimmen, Consultant, PhD
- Martine Enger, Consultant, PhD
- Wender Figved, Consultant, PhD
- Tore Fjalestad, Consultant, PhD
- Gunnar Flugsrud, Consultant, PhD
- Frede Frihagen, Consultant, PhD
- Alexander Fraser, Consultant, PhD
- Johan Hellund, Consultant, PhD
- Elisabeth Ellingsen Husebye, Consultant, PhD
- Lene Solberg, Consultant, PhD
- Jan Erik Madsen, Professor UiO / Consultant OUH
- Lars Nordsletten, Professor UiO / Consultant OUH
- Olav Røise, Professor UiO
- Mads Sundet, Consultant, PhD

Research profile and aims

The Orthopaedic Trauma Research Group aims to initiate and conduct clinical and experimental trials at a high international level related to Orthopaedic Trauma. 15–25 continuously ongoing PhD projects, mainly externally financed, provide the main scientific production. Local and national registries on pelvic fractures, hip fractures and polytrauma are major contributors to high quality clinical studies.

Ongoing PhD projects

- “Does the trochanteric stabilizing plate increase stability in trochanteric hip fractures?”
Carl Erik Alm
- “Aspects on unstable distal radius”
Morten Eikrem
- “Complex fractures around the elbow”
Kristin Jørgensen



- “Primary and secondary total hip arthroplasty following acetabular fractures”
Ragnhild Kirkebø
- “Fracture- dislocations of the elbow”
Kaare Midtgaard
- “Advances in diagnosis and treatment of unstable, acute Lisfranc injury”
Magnus Poulsen
- “Proximal hamstring avulsions – prognosis and treatment”
Anne Mari Rosenlund
- “Non-operative versus operative treatment of suprasyndesmotic ankle fractures”
Ola Saatvedt
- “Incidence, classification, and follow-up of acromioclavicular joint injuries”
Stein Arve Skjaker
- “Improvements in osteotomy techniques based on 3D print technology”
Geir Solberg
- “The effect of salmon bone meal on bone healing in rats”
Ole Tomelthy

Ongoing postdoc projects

- “The Hip Fracture Surgical Approach Trial”
Mads Sundet
- “Operative treatment of proximal humerus fractures with RTSA – long term results”
Alexander Fraser





Most important national and international collaborators

National

- Akershus University Hospital (AHUS)
- Asker & Bærum Hospital
- Diakonhjemmet Hospital
- Institute for Surgical Research, OUH
- Gjøvik Hospital
- Lovisenberg Diaconal Hospital
- Martina Hansens Hospital
- Norwegian School of Sport Sciences
- Sunnaas Rehabilitation Hospital
- The Norwegian Arthroplasty Register
- Østfold Hospital Health Authority

International

- University of Tampere, Finland
- Aarhus University Hospital, Denmark
- AO Trauma
- Sahlgrenska University Hospital, Gothenburg, Sweden
- Steadman Philippon Research Institute, Colorado, USA
- Uppsala University Hospital, Sweden
- ISOPS (International Society of Pelvic Surgeons)

Scientific production of the research group in 2024

PhD dissertations:

Cand. Med. Stian Svenøy

"Hip Fracture: Complications and Consequences", UiO 30.08.2024.

Peer reviewed original research articles: 33

Invited lectures at international congresses: Numerous

Selected publications:

1. E. Pihl, S. Laszlo, A. M. Rosenlund, M. H. Kristoffersen, J. Schilcher, C. J. Hedbeck, et al. Operative versus Nonoperative Treatment of Proximal Hamstring Avulsions. NEJM Evid 2024 Vol. 3 Issue 8 Pages EVIDoa2400056, Accession Number: 39023393 DOI: 10.1056/EVIDoa2400056
2. Fraser AN, Wagle TM, Karlberg A, Madsen JE, Mellberg M, Lian T, Mader S, Eilertsen L, Apold H, Larsen LB, Pripp AH, Fjalestad T. Reverse shoulder arthroplasty is superior to plate fixation for displaced proximal humerus fractures in the elderly. Five-year follow up of the DelPhi randomized controlled trial. JBJS, ():10.2106/JBJS.23.01431, September 20, 2024. DOI: 10.2106/JBJS.23.01431
3. Kirkeboe RL, Madsen JE, Nordsletten L, Clarke-Jenssen J. Acute treatment of elderly patients with acetabular fractures by open reduction, internal fixation, and total hip arthroplasty: a 1–10-year follow-up of 48 patients. Acta Orthop; 95: 661-6, 2024

Funding

- South-Eastern Norway Regional Health Authority
- UiO
- OUH
- Endowment and funds





Oslo Sports Trauma Research Center - OSTRC



Group Leaders

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- Christine Holm Moseid, MD/PhD, Research Scientist, OSTRC
- Stian Sandmo, MD/PhD, OUH
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- Sophie Steenstrup PT/PhD
- Arnlaug Wangensteen, PT/PhD
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Group Members (continued)

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- Lena Bache-Mathiesen, PhD fellow, OSTRC
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- Tor Kristian M Andresen, MD/PhD fellow, Ahus
- Cecilie Nagy, MD/PhD fellow, OSTRC
- Kyle Martin, MD/Phd fellow, OSTRC

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- Emilie Bratt Jakhell, MSc, OSTRC
- Erling Hisdsal, MSc, OSTRC
- Ingrid Eir Thorp Eythorsdottir, MSc, OSTRC

Research profile and aims

The Oslo Sports Trauma Research Center was established in May 2000 at the Norwegian School of Sport Sciences as a joint research venture between the Department of Orthopaedic Surgery (Oslo University Hospital), and the Department of Sports Medicine (Norwegian School of Sport Sciences). The aim is to prevent injuries and other health problems in sports through research on risk factors, injury mechanisms and prevention methods, with a particular emphasis on football, team handball and alpine skiing/snowboarding. In addition to primary injury prevention research, our cartilage and ligament





research group is focused on secondary prevention, i.e. surgical and nonsurgical treatment options to prevent future osteoarthritis.

The goal of the center is to strengthen Norwegian health research by providing a catalyst for innovation among highly-ranked researchers and delivering superior research training and mentorship. The emphasis is not only on the production of new knowledge, but also the translation of research findings into improvements in the health of Norwegians and the Norwegian health care system.

Ongoing projects

In 2024 the Oslo Sports Trauma Research Center has published 83 articles in international journals with peer review. 10 master's students have defended their master's degrees and 2 PhD students have defended their dissertations. By the end of 2024 the Center had 119 ongoing projects, 5 accepted and 25 submitted articles. In addition, 21 projects were in the planning stage and 10 projects were temporarily on hold. You can find a complete list of projects in the Center's annual rapport for 2024.

Most important national and international collaborators

National

- The Norwegian Olympic and paralympic committee and confederation of sports

International

- Steadman Philippon Research Institute, Vail, US
- International Olympic Committee (IOC)
- International Ski Federation
- Federation Internationale de Football Association
- Federation Internationale de Volleyball
- Aspetar, Doha, Qatar

Scientific production of the research group in 2024

Peer reviewed original research articles: 83

Other publications: 23

Invited lectures at international congresses/webinar: 74

Doctoral thesis:

Amundsen, Roar.

Hamstring injuries in women's football – Building the foundation for future hamstring injury prevention. Norges idrettshøgskole 2024. ISBN 978-82-502-0619-9

Nordstrøm, Anine.

Injuries in junior and senior ice hockey – burden and potential risk factors. Universitetet i Oslo 2024 ISBN 978-82-348-0472-4





Selected publications:

Berg, Bjørnar; Roos, Ewa M.; Englund, Martin Trøan; Kise, Nina Jullum; Engebretsen, Lars; Eftang, Cathrine Nørstad; Risberg, May Arna.

Arthroscopic partial meniscectomy versus exercise therapy for degenerative meniscal tears – 10-year follow-up of the OMEX randomised controlled trial. British Journal of Sports Medicine 2025; 59(2), 91-98. E-pub 2024

Birkenes, Thomas; Furnes, Ove Nord; Lygre, Stein Håkon Låstad; Solheim, Eirik Johan; Årøen, Asbjørn; Knutsen, Gunnar; Drogset, Jon Olav; Heir, Stig; Engebretsen, Lars; Løken, Sverre Bertrand; Visnes, Håvard.

Long-term outcomes of arthroscopically verified focal cartilage lesions in the knee – a 19-year multicenter follow-up with patient-reported outcomes. Journal of Bone and Joint Surgery. American volume 2024; 106(21), 1991-2000

Kamatsuki, Yusuke; Qvale, Marie Synnøve; Steffen, Kathrin; Wangensteen, Arnlaug; Krosshaug, Tron. Anatomic risk factors for initial and secondary noncontact anterior cruciate ligament injury – a prospective cohort study in 880 female elite handball and soccer players. American Journal of Sports Medicine 2025; 53(1), 123-131. E-pub 2024

Funding

- Norwegian Ministry of Culture
- The Research Council of Norway
- International Olympic Committee
- Norwegian Olympic and Paralympic Committee and Confederation of Sports
- Norwegian School of Sport Sciences
- Smith & Nephew
- The Savings Bank Foundation DNB
- Stiftelsen DAM
- Den norske legeforening - Fond til kvalitetsforbedring og pasientsikkerhet
- UEFA
- FIFA
- Various grants from other sources





Research group SPINE



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Group Members

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- Roger Trana, MD
- Ole Rasmus Robak, MD
- Mads Peder Rolfsen, MD, PhD-cand
- Torstein Schrøder-Aasen, MD/PhD
- Engelke Randers, MD, PhD-cand
- Filip Dolatowski, MD, PhD
- Svend Vinje, MD
- Jon Olav Rigsby, MD
- Rolf Riise, MD
- Vinjar Hansen, MD
- Ole Christian Aalhaug, MD/PhD
- Sverre Mjønes, MD

Associate Group Members

- Kjersti Storheim, Professor
- Jens Ivar Brox, Professor
- Kari Indrekvam, Professor
- Oliver Grundnes, MD/PhD
- Tore Solberg, MD/PhD
- Britt Stuge, Physical therapist, PhD
- Inger Holm, Professor
- Ivar Austevoll, MD, PhD-cand
- Håvard Furunes, MD, PhD-cand
- Erland Hermansen, MD, PhD-cand
- Frode Rekeland, MD, PhD-cand
- Stephan Röhrli MD/PhD
- Ansgar Espeland MD/PhD
- Hasan Banitalebi MD
- Karianne Gammelsrud MD/PhD
- Simran Kaur, MD
- Tore Solberg, Professor
- Paul Gerdhem, Professor
- Helena Brisby, Professor
- John-Anker Zwart, Professor





Research profile and aims

The main intention of the group is to promote clinical spine research.

Ongoing projects

National multicentre studies and PhD:

- NORDSTEN-study – clinical trials comparing the efficacy of different surgical methods for spinal stenosis and degenerative spondylolisthesis and spinal stenosis. Most hospitals in Norway performing spine surgery participate, including orthopaedic and neurosurgical departments. Christian Hellum is the leader of the scientific committee. He has been the supervisor of Ivar Austevoll and co-supervisor for Frode Rekeland and Hasan Banitalebi.
- Modic study – started in May 2015 (financed by NFR, The Western Norway Regional Health Authority and Central Norway Regional Health Authority, and including 3 doctoral students). This is a double-blind clinical trial evaluating the effectiveness of antibiotics in selected patients with back pain and altered endplate morphology. Main outcomes published in 2019. Furthermore a biopsy study on patients with Modic changes was planned in 2016, and started in 2018. Mads Peder Rolfsen is a PhD candidate in this project, supervised by Christian Hellum. AHUS, Stavanger University Hospital and Haukeland University Hospital participate in the biopsy study. This collaboration also include the department of Microbiology by Karianne Gammelsrud, Pathology and Medical Genetics at OUH.
- A study on patients with chronic low back pain is in planning comparing non surgical treatment with fusion surgery. The study is financed by Central Norway Regional Health Authority. Sverre Mjønes is the PhD candidate supervised by Christian Hellum and Philip Dolotowski. This is a multicenter study in collaboration with Haukeland University Hospital, Drammen sykehus and Akershus Universitetssykehus. Inclusion of patients planned for 2024.
- SIFSO study – (Sacrolilac Fusion vs Sham Operation) The inclusion was finalized in october 2021. This is a double blinded randomized controlled trial comparing sacroiliac joint fusion vs sham surgery. Engelke Randers is the PhD candidate and the project is supervised by Britt Stuge, Stephan Røhrl and Lars Nordsletten. This is a collaboration with prof. Gerdhem in Karolinska Hospital in Stockholm, Sweden and finished in 2024.
- Improving the diagnostic accuracy, reproducibility and clinical usefulness of MRI and X-ray in patients with lumbar spinal stenosis (Data from the NORDSTEN-study)
PhD student Hasan Banitalebi
Supervisor: Anne Negård, Christian Hellum, Ansgar Espeland
Status: Study finished in 2024 and defended his thesis in June 2024.
- Study on Thoracolumbar Burst Fractures (SunBurst): Multinational RCT investigating the effect of operative vs. conservative treatment on vertebral burst fractures (A3 and A4 type fracture without neurological deficit). This Trial was designed and initiated by the Swedish Fracture Register and Professor Paul Gerdhem is the guarantor. Main site investigator: Dr Filip Dolotowski, MD PhD. This study finished inclusion of patients in 2024.
- Study of adjacent level degeneration after fusion surgery of the spine. The study is a multicenter randomized register study. The study is in planning. Simran Kaur is affiliated to SIV and Formi at OUS and planned to be PhD candidate. We received funding from South Eastern Norway Regional Health Authority 2024.





Other studies and PhD:

- “Sacroiliac joint fusion for treatment of sacroiliac pain”
PhD student: Engelke Randers, MD
Supervisors: Britt Stuge, Stephan Røhrl and Lars Nordsletten
Status: Study ended 2024.
- “Scoliosis in patients with cerebral palasy”
PhD student: Sven Vinje
Supervisors: Thomas Johan Kibsgård, Terje Terjesen, Reidun Jahnsen
Status: Study ongoing
- “Indications and Treatment of Adult Kypho- Scoliosis” (INTRAKS Study)
PhD student: Vinjar Hansen
Supervisors: Stephan Röhrl, Thomas Kibsgård og Christian Hellum
Status: Inclusion of patients completed.

Manuscripts in preparation:

- In planning of thoracolumbar fracture study, OUH, Orthopaedic department
Filip Dolatowski, Torstein Schrøder-Aasen

Most important national and international collaborators

National

- NORDSTEN and MODIC studies/Biopsy study of Modic changes, include most spine surgical departments and out patient clinic in phys med & rehab, and some spine out patient clinics (reuma in Norway). Further Radiological departments at OUH, AHUS and Haukeland University Hospital, Departments of Microbiology, Pathology and Medical Genetics, OUH
- Thomas Natvik, Haukeland University Hospital, derformity register and Erik Aunan, Lillehammer
- The Norwegian Registry for spine surgery

International

- Helena Brisby, Dept. of Orthopaedics, Sahlgrenska University Hospital, Sweden
- Bungo Otsuki, Kyoto Nakagyo Ward, Japan
- Paul Gerhem, Karolinska sjukhuset, Stockholm, Sweden
- Fredrik Stromqvist, Orthopaedic dept., Skåne University Hospital, Sweden





Scientific production of the research group in 2024

Peer reviewed original research articles:

Selected publications:

The effect of minimally invasive sacroiliac joint fusion compared to sham operation: a double- blinded randomized placebo-controlled trial

EM Randers, P Gerdhem, T Kibsgård, [thelancet.com](https://www.thelancet.com), 2024

Decompression alone or with fusion for degenerative lumbar spondylolisthesis (Nordsten-DS): five year follow-up of a randomised, multicentre, non-inferiority trial

Eric Loratang Kgomotso, Christian Hellum... Ivar Magne Austevoll *BMJ*, 2024

Redefining Oswestry Disability Index success criteria to assess the effect of consecutive surgeries on lumbar spinal stenosis

OK Alhaug, FC Dolatowski - *The Spine Journal*, 2024





REMEDY – Center for treatment of Rheumatic and Musculoskeletal Diseases



Group Leader

Espen A. Haavardsholm, Professor in Rheumatology, UiO, Head of Research and Innovation, Diakonhjemmet Hospital, and Center director REMEDY
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Group Members

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- Till Uhlig, Professor/consultant, MD
- Tore K. Kvien, Professor emeritus/MD
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- Silje Syversen, Associate professor/consultant, MD
- Guro Løvik Goll, Associate professor/consultant, MD
- Ida K. Haugen, Senior researcher, MD
- Nina Østerås, Professor, PT
- Anne Therese Tveter, Professor, PT
- Anne Grete Semb, Senior researcher, MD (cardiologist)
- Sella Provan, Professor/consultant, MD
- Ingvild Kjekken, Professor/OT
- Marte Schrumf Heiberg, Senior researcher/consultant, MD
- Anna Birgitte Aga, Senior researcher /consultant, MD
- Nina Sundlisæter, Senior researcher /MD
- Rikke Moe, Senior researcher/PT
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- Inger Jorid Berg, Postdoctoral fellow/MD
- Ulf Sundin, Postdoctoral fellow/MD
- Lena Nordberg, Postdoctoral fellow/MD
- Pernille Steen Pettersen, Postdoctoral fellow/MD

Research profile and aims

REMEDY - Center for treatment of Rheumatic and Musculoskeletal Diseases is a “Centre for Clinical Treatment Research”. It was established in 2022 with funding from the Research Council of Norway (128 million NOK) as a targeted, long-term investment to strengthen and further develop outstanding research and innovation environments to improve treatment. In addition, REMEDY is supported by a generous grant from the Olav Thon Foundation (32 million NOK). Diakonhjemmet Hospital is the host institution for the research center. In addition, four institutions are involved as partners - Oslo University Hospital, University of Oslo, Norwegian Rheumatism Association and the MAGIC Foundation.





Our aim is to evolve patient care in the field of rheumatology and musculoskeletal diseases (RMDs). RMDs constitute a heterogeneous group of diseases associated with significant morbidity, reduced quality of life, and increased mortality. The conditions have major consequences for society and the individual.

We seek to develop novel therapies and excellent treatment strategies by adopting a comprehensive research approach to the field, organized in seven workpackages. We strive to conduct clinical studies that have the potential to change clinical practice.

Please see [REMEDY annual report for 2024](#)

Ongoing projects

- RA-DRUM study (Therapeutic drug monitoring RCT)
- NOR-DMARD study (longitudinal follow-up after drug intervention)
- ARCTIC-REWIND (Drug tapering in RA, RCT)
- MERINO (first-line treatment of Hand osteoarthritis)
- NOR-CACTUS (comparing treatment strategies for Carpal Tunnel Syndrome)
- The Norwegian part of NORD-STAR (first-line treatment of RA, RCT)
- NOR-GOUT (longitudinal study on gout patients)
- ATACC-RA (cardiovascular risk in RA)
- SURF-RA (cardiovascular risk in RA and related diseases)
- BioTest (Experimental precision medicine involving synovial biopsies)
- HIFSAT (study of surgical approach in hip fracture)
- NOR Sprint (Treatment strategies in early psoriatic arthritis)
- PICASSO (treatment of CMC1-osteoarthritis)
- Nor-vaC (immunological response to Covid-19 vaccines in IMIDs)
- RIMRA (Rheumatic immune-related side effects in patients treated with immunotherapy)
- ARCTIC-FORWARD (10 year follow-up of the ARCTIC patients)
- NOR-CACTUS (Treatment strategies in carpal tunnel syndrome)
- A number of other ongoing projects and trials, for complete overview follow this [link](#)

Most important national and international collaborators

National

- All Norwegian rheumatological departments
- Several rehabilitation institutions

International

- Prof. Daniel H. Solomon, Boston, USA
- Prof. Desiree van der Heijde, Leiden, Netherlands
- Prof. Johan Askling, Stockholm, Sweden
- Prof. Ronald F. van Vollenhoven, Amsterdam, Netherlands
- Prof. Merete Lund Hetland, Copenhagen, Denmark
- Prof. Mikkel Østergaard, Copenhagen, Denmark
- MD, PhD Lene Terslev, Copenhagen, Denmark
- Prof. Nicola Dalbeth, Auckland, New Zealand





Funding

- Southern and Eastern Norway Regional Health Authority
- The Research Council of Norway
- The Olav Thon Foundation
- KLINBEFORSK
- Horizon Europe
- For complete overview of funding see our annual report from 2024, page 119

Scientific production of the research group in 2024

Peer reviewed original research articles: 57

Selected publications:

Brun MK, Gehin JE, Bjørlykke KH, Warren DJ, Klaasen RA, **Sexton J**, Sandanger Ø, **Kvien TK**, Mørk C, Jahnsen J, Bolstad N, Jørgensen KK, **Haavardsholm EA**, **Goll GL**, **Syversen SW**. Clinical consequences of infliximab immunogenicity and the effect of proactive therapeutic drug monitoring: exploratory analyses of the randomised, controlled NOR-DRUM trials. **Lancet Rheumatol.** 2024 Apr;6(4):e226-e236. doi: 10.1016/S2665-9913(23)00341-7. Epub 2024 Feb 22. PMID: 38402891.

Kjørholt KE, **Sundlisæter NP**, **Aga AB**, **Sexton J**, Olsen IC, Fremstad H, Spada C, Madland TM, Høili CA, Bakland G, Lexberg Å, Hansen IJW, Hansen IM, Haukeland H, Ljoså MA, **Moholt E**, **Uhlig T**, **Kvien TK**, Solomon DH, van der Heijde D, **Haavardsholm EA**, **Lillegraven S**. Effects of tapering conventional synthetic disease-modifying antirheumatic drugs to drug-free remission versus stable treatment in rheumatoid arthritis (ARCTIC REWIND): 3-year results from an open-label, randomised controlled, non-inferiority trial. **Lancet Rheumatol.** 2024 May;6(5):e268-e278. doi: 10.1016/S2665-9913(24)00021-3. Epub 2024 Apr 4. PMID: 38583450.

Nordberg LB, **Pohl H**, **Haavardsholm EA**, **Lillegraven S**, Bretthauer M. Carbon-Footprint Analyses in RCTs - Toward Sustainable Clinical Practice. **N Engl J Med.** 2024 Jun 27;390(24):2234-2236. doi: 10.1056/NEJMp2402018. Epub 2024 May 15. PMID: 38749030.





Publication list OPK research groups 2024

(original articles or review articles)

Aga C, Trøan I, Heir S, **Risberg MA**, Rana T, Johansen S, Fagerland MW, **Engebretsen L** (2024)
No difference in osteoarthritis, but less graft failures after 5 years, comparing anatomic double-bundle to anatomic single-bundle ACL reconstruction

Knee Surg Sports Traumatol Arthrosc (in press)

DOI [10.1002/ksa.12528](https://doi.org/10.1002/ksa.12528), PubMed [39506539](https://pubmed.ncbi.nlm.nih.gov/39506539/)

Alhaug OK, **Dolatowski FC** (2024)

Redefining Oswestry Disability Index success criteria to assess the effect of consecutive surgeries on lumbar spinal stenosis

Spine J, 24 (12), 2305-2313

DOI [10.1016/j.spinee.2024.08.028](https://doi.org/10.1016/j.spinee.2024.08.028), PubMed [39276870](https://pubmed.ncbi.nlm.nih.gov/39276870/)

Alhaug OK, **Dolatowski FC**, Kaur S, Lønne G (2024)

Postoperative complications after surgery for lumbar spinal stenosis, assessment using two different data sources

Acta Neurochir (Wien), 166 (1), 189

DOI [10.1007/s00701-024-06086-y](https://doi.org/10.1007/s00701-024-06086-y), PubMed [38653826](https://pubmed.ncbi.nlm.nih.gov/38653826/)

Alm CE, Karlsten A, **Madsen JE**, **Nordsletten L**, **Brattgjerd JE**, Pripp AH, Frihagen F, **Röhrli SM** (2024)

No benefit of the trochanteric stabilizing plate on loss of fracture reduction in AO/OTA 31-A2 trochanteric fractures

Bone Jt Open, 5 (1), 37-45

DOI [10.1302/2633-1462.51.BJO-2023-0082.R1](https://doi.org/10.1302/2633-1462.51.BJO-2023-0082.R1), PubMed [38240179](https://pubmed.ncbi.nlm.nih.gov/38240179/)

Andersen MR, Wendt Ræder LB, **Stødle AH** (2024)

Arthroscopic Repair of the Anterior Inferior Tibiofibular Ligament

Arthrosc Tech, 14 (1), 103166

DOI [10.1016/j.eats.2024.103166](https://doi.org/10.1016/j.eats.2024.103166), PubMed [39989685](https://pubmed.ncbi.nlm.nih.gov/39989685/)

Avram GM, Królikowska A, **Bøe B**, Reichert P, Popescu IA, Becker R, Prill R (2024)

Surgical decisions on implant-related parameters can enhance knowledge transfer for glenoid bone grafting in primary reverse shoulder arthroplasty: a scoping review of heterogeneity sources

EFORT Open Rev, 9 (10), 990-1001

DOI [10.1530/EOR-23-0128](https://doi.org/10.1530/EOR-23-0128), PubMed [39360790](https://pubmed.ncbi.nlm.nih.gov/39360790/)





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Preoperative fatty infiltration of paraspinal muscles assessed by MRI is associated with less improvement of leg pain 2 years after surgery for lumbar spinal stenosis

Eur Spine J, 33 (5), 1967-1978

DOI [10.1007/s00586-024-08210-z](https://doi.org/10.1007/s00586-024-08210-z), PubMed [38528161](https://pubmed.ncbi.nlm.nih.gov/38528161/)

Berg B, Gorosito MA, Fjeld O, Haugerud H, Storheim K, Solberg TK, Grotle M (2024)

Machine Learning Models for Predicting Disability and Pain Following Lumbar Disc Herniation Surgery

JAMA Netw Open, 7 (2), e2355024

DOI [10.1001/jamanetworkopen.2023.55024](https://doi.org/10.1001/jamanetworkopen.2023.55024), PubMed [38324310](https://pubmed.ncbi.nlm.nih.gov/38324310/)

Birkenes T, Furnes O, Lygre SHL, Solheim E, Årøen A, Knutsen G, Drogset JO, Heir S, **Engebretsen L**, **Løken S**, Visnes H (2024)

Previous cartilage surgery is associated with inferior patient-reported outcomes after knee arthroplasty

Knee Surg Sports Traumatol Arthrosc, 32 (2), 361-370

DOI [10.1002/ksa.12050](https://doi.org/10.1002/ksa.12050), PubMed [38294966](https://pubmed.ncbi.nlm.nih.gov/38294966/)

Birkenes T, Furnes O, Laastad Lygre SH, Solheim E, Aaroen A, Knutsen G, Drogset JO, Heir S, **Engebretsen L**, **Loken S**, Visnes H (2024)

Long-Term Outcomes of Arthroscopically Verified Focal Cartilage Lesions in the Knee: A 19-Year Multicenter Follow-up with Patient-Reported Outcomes

J Bone Joint Surg Am, 106 (21), 1991-2000

DOI [10.2106/JBJS.23.00568](https://doi.org/10.2106/JBJS.23.00568), PubMed [39283959](https://pubmed.ncbi.nlm.nih.gov/39283959/)

Borgen PO, Frydenlund K, **Terjesen T** (2024)

Long-term results of a modified Spitzzy shelf operation for hip dysplasia: 79 adults with a mean follow-up of 33 years

Eur J Orthop Surg Traumatol, 34 (4), 1817-1823

DOI [10.1007/s00590-024-03861-6](https://doi.org/10.1007/s00590-024-03861-6), PubMed [38421493](https://pubmed.ncbi.nlm.nih.gov/38421493/)

Breen AB, **Steen H**, Pripp A, Niratisairak S, **Horn J** (2024)

Accuracy of 4 Different Methods for Estimation of Remaining Growth and Timing of Epiphysiodesis

J Bone Joint Surg Am, 106 (20), 1888-1894

DOI [10.2106/JBJS.23.01483](https://doi.org/10.2106/JBJS.23.01483), PubMed [39052759](https://pubmed.ncbi.nlm.nih.gov/39052759/)

Brisby H, Myklebust TÅ, Banitalebi H, Austevoll I, Aaen J, Storheim K, **Hellum C**, Franssen E, Indrekvam K, Hermansen E (2024)

Adjacent Level Canal Area Changes up to Two Years After Lumbar Spinal Stenosis Decompressive Surgery





Spine (Phila Pa 1976), 50 (7), 429-436

DOI [10.1097/BRS.0000000000005247](https://doi.org/10.1097/BRS.0000000000005247), PubMed [39722554](https://pubmed.ncbi.nlm.nih.gov/39722554/)

Eikrem M, Lian T, **Madsen JE**, Figved W (2024)

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Cureus, 16 (4), e58576

DOI [10.7759/cureus.58576](https://doi.org/10.7759/cureus.58576), PubMed [38765412](https://pubmed.ncbi.nlm.nih.gov/38765412/)

Engebretsen L, Møller M, Kooy C, Yamaguchi T, **Moatshe G** (2024)

The gender and sex data gap in anterior cruciate ligament injuries in paediatric patients

Knee Surg Sports Traumatol Arthrosc, 32 (10), 2500-2504

DOI [10.1002/ksa.12397](https://doi.org/10.1002/ksa.12397), PubMed [39126265](https://pubmed.ncbi.nlm.nih.gov/39126265/)

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J Hand Ther, 37 (4), 544-554

DOI [10.1016/j.jht.2024.02.008](https://doi.org/10.1016/j.jht.2024.02.008), PubMed [38942657](https://pubmed.ncbi.nlm.nih.gov/38942657/)

Familiari F, Chahla J, Compagnoni R, DePhillipo NN, **Moatshe G**, LaPrade RF, Meniscus International Network (MenIN) Study Group (2024)

Meniscal extrusion consensus statement: A collaborative survey within the Meniscus International Network (MenIN) Study Group

Knee Surg Sports Traumatol Arthrosc, 32 (6), 1446-1454

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Finstad J, **Røise O**, Clausen T, Rosseland LA, Havnes IA (2024)

A qualitative longitudinal study of traumatic orthopaedic injury survivors' experiences with pain and the long-term recovery trajectory

BMJ Open, 14 (1), e079161

DOI [10.1136/bmjopen-2023-079161](https://doi.org/10.1136/bmjopen-2023-079161), PubMed [38191252](https://pubmed.ncbi.nlm.nih.gov/38191252/)

Franssen E, Weber C, Myklebust TÅ, Austevoll IM, Brisby H, **Hellum C**, Storheim K, Aaen J, Banitalebi H, Brox JI, Indrekvam K, Hermansen E (2024)

Clinical Importance of Redundant Nerve Roots in Patients With Symptomatic Lumbar Spinal Stenosis: A Secondary Analysis of NORDSTEN Spinal Stenosis Trial Data

Spine (Phila Pa 1976), 50 (14), 941-947

DOI [10.1097/BRS.0000000000005160](https://doi.org/10.1097/BRS.0000000000005160), PubMed [39324936](https://pubmed.ncbi.nlm.nih.gov/39324936/)

Fraser AN, **Wagle TM**, Karlberg AC, **Madsen JE**, Mellberg M, Lian T, Mader S, Eilertsen L, Apold H, Larsen LB, Pripp AH, **Fjalestad T** (2024)





Reverse Shoulder Arthroplasty Is Superior to Plate Fixation for Displaced Proximal Humeral Fractures in the Elderly: Five-Year Follow-up of the DelPhi Randomized Controlled Trial

J Bone Joint Surg Am, 106 (21), 1945-1956

DOI [10.2106/JBJS.23.01431](https://doi.org/10.2106/JBJS.23.01431), PubMed [39303024](https://pubmed.ncbi.nlm.nih.gov/39303024/)

Hermansen E, Indrekvam K, Franssen E, Myklebust TÅ, Austevoll IM, **Hellum C**, Storheim K, Bånerud IF, Ebbs EK, Aaen J, Banitalebi H, Brox JI, Weber C, Solberg T, Hjulstad A, Brisby H (2024)

ISSLS Prize in Clinical Science 2025: A randomized trial on three different minimally invasive decompression techniques for lumbar spinal stenosis. Five years follow-up from the NORDSTEN-SST

Eur Spine J, 34 (5), 1590-1599

DOI [10.1007/s00586-024-08514-0](https://doi.org/10.1007/s00586-024-08514-0), PubMed [39448401](https://pubmed.ncbi.nlm.nih.gov/39448401/)

Hermansen E, Myklebust TÅ, Austevoll IM, **Hellum C**, Storheim K, Banitalebi H, Indrekvam K, Brisby H (2024)

Dural Sac Cross-sectional area change from preoperatively and up to 2 years after decompressive surgery for central lumbar spinal stenosis: investigation of operated levels, data from the NORDSTEN study

Eur Spine J, 33 (6), 2234-2241

DOI [10.1007/s00586-024-08251-4](https://doi.org/10.1007/s00586-024-08251-4), PubMed [38587545](https://pubmed.ncbi.nlm.nih.gov/38587545/)

Hestnes I, Solberg LB, Meyer HE, Sundet M, Rimal R, **Nordsletten L**, Hakestad KA (2024)

The hip fracture incidence in the high-risk area Oslo continues to decline

Osteoporos Int, 35 (9), 1615-1623

DOI [10.1007/s00198-024-07156-8](https://doi.org/10.1007/s00198-024-07156-8), PubMed [38922398](https://pubmed.ncbi.nlm.nih.gov/38922398/)

Hoås EF, Majeed WM, **Røise O**, Uleberg O (2024)

Adherence to national trauma triage criteria in Norway: a cross-sectional study

Scand J Trauma Resusc Emerg Med, 32 (1), 133

DOI [10.1186/s13049-024-01306-x](https://doi.org/10.1186/s13049-024-01306-x), PubMed [39696552](https://pubmed.ncbi.nlm.nih.gov/39696552/)

Indrekvam K, Myklebust TÅ, Austevoll IM, Hermansen E, Banitalebi H, Bånerud IF, Weber C, Brisby H, Brox JI, **Hellum C**, Storheim K (2024)

Responsiveness of the Oswestry Disability Index and Zurich Claudication Questionnaire in patients with lumbar spinal stenosis: evaluation of surgically treated patients from the NORDSTEN study

Eur Spine J, 33 (11), 4270-4280

DOI [10.1007/s00586-024-08440-1](https://doi.org/10.1007/s00586-024-08440-1), PubMed [39134699](https://pubmed.ncbi.nlm.nih.gov/39134699/)

Jacobsen JS, O'Brien MJM, Christensen JR, **Risberg MA**, Milne L, Balakumar J, Jakobsen SS, Mechlenburg I, Kemp J (2024)

Rehabilitation following periacetabular osteotomy for acetabular dysplasia: A qualitative interview study exploring challenges, hopes and expectations among patients in Denmark and Australia





Int J Orthop Trauma Nurs, 54, 101116

DOI [10.1016/j.ijotn.2024.101116](https://doi.org/10.1016/j.ijotn.2024.101116), PubMed [38925029](https://pubmed.ncbi.nlm.nih.gov/38925029/)

Karlsen ØE, Snorrason F, Westberg M (2024)

A prospective multicentre study of 82 prosthetic joint infections treated with a standardised debridement and implant retention (DAIR) protocol followed by 6 weeks of antimicrobial therapy: favourable results

Hip Int, 35 (1), 62-69

DOI [10.1177/11207000241295604](https://doi.org/10.1177/11207000241295604), PubMed [39562499](https://pubmed.ncbi.nlm.nih.gov/39562499/)

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Decompression alone or with fusion for degenerative lumbar spondylolisthesis (Nordsten-DS): five year follow-up of a randomised, multicentre, non-inferiority trial

BMJ, 386, e079771

DOI [10.1136/bmj-2024-079771](https://doi.org/10.1136/bmj-2024-079771), PubMed [39111800](https://pubmed.ncbi.nlm.nih.gov/39111800/)

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J Nepal Health Res Counc, 22 (2), 316-323

DOI [10.33314/jnhrc.v22i02.5385](https://doi.org/10.33314/jnhrc.v22i02.5385), PubMed [39572951](https://pubmed.ncbi.nlm.nih.gov/39572951/)

Kirkeboe RL, Madsen JE, Nordsletten L, Clarke-Jenssen J (2024)

Acute treatment of elderly patients with acetabular fractures by open reduction, internal fixation, and total hip arthroplasty: a 1-10-year follow-up of 48 patients

Acta Orthop, 95, 661-666

DOI [10.2340/17453674.2024.42113](https://doi.org/10.2340/17453674.2024.42113), PubMed [39565358](https://pubmed.ncbi.nlm.nih.gov/39565358/)

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Platelet-rich plasma injections for the management of knee osteoarthritis: The ESSKA-ICRS consensus. Recommendations using the RAND/UCLA appropriateness method for different clinical scenarios

Knee Surg Sports Traumatol Arthrosc, 32 (11), 2938-2949

DOI [10.1002/ksa.12320](https://doi.org/10.1002/ksa.12320), PubMed [38961773](https://pubmed.ncbi.nlm.nih.gov/38961773/)





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Comparison of the AO/OTA 1996/2007 and 2018 pelvic ring fracture classifications

Arch Orthop Trauma Surg, 144 (10), 4587-4593

DOI [10.1007/s00402-024-05557-2](https://doi.org/10.1007/s00402-024-05557-2), PubMed [39384630](https://pubmed.ncbi.nlm.nih.gov/39384630/)

Madsen JE, Flugsrud GB, Hammer N, Puchwein P (2024)

Emergency treatment of pelvic ring injuries: state of the art

Arch Orthop Trauma Surg, 144 (10), 4525-4539

DOI [10.1007/s00402-024-05447-7](https://doi.org/10.1007/s00402-024-05447-7), PubMed [38970673](https://pubmed.ncbi.nlm.nih.gov/38970673/)

Martin RK, Marmura H, Wastvedt S, Pareek A, **Persson A**, **Moatshe G**, Bryant D, Wolfson J, **Engebretsen L**, Getgood A (2024)

External validation of the Norwegian anterior cruciate ligament reconstruction revision prediction model using patients from the STABILITY 1 Trial

Knee Surg Sports Traumatol Arthrosc, 32 (2), 206-213

DOI [10.1002/ksa.12031](https://doi.org/10.1002/ksa.12031), PubMed [38226736](https://pubmed.ncbi.nlm.nih.gov/38226736/)

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Am J Sports Med, 52 (4), 881-891

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Achondroplasia current concept of orthopaedic management

J Child Orthop, 18 (5), 461-476

DOI [10.1177/18632521241269340](https://doi.org/10.1177/18632521241269340), PubMed [39391573](https://pubmed.ncbi.nlm.nih.gov/39391573/)

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Am J Sports Med, 52 (6), 1491-1497

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J Rehabil Med, 56, jrm40078

DOI [10.2340/jrm.v56.40078](https://doi.org/10.2340/jrm.v56.40078), PubMed [38803207](https://pubmed.ncbi.nlm.nih.gov/38803207/)

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Multiligament knee injury (MLKI): an expert consensus statement on nomenclature, diagnosis, treatment and rehabilitation

Br J Sports Med, 58 (23), 1385-1400

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Indian J Orthop, 58 (11), 1528-1536

DOI [10.1007/s43465-024-01267-4](https://doi.org/10.1007/s43465-024-01267-4), PubMed [39539327](https://pubmed.ncbi.nlm.nih.gov/39539327/)

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Decrease in incidence of distal radius fractures in Oslo, Norway

Arch Osteoporos, 19 (1), 28

DOI [10.1007/s11657-024-01383-6](https://doi.org/10.1007/s11657-024-01383-6), PubMed [38602605](https://pubmed.ncbi.nlm.nih.gov/38602605/)

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NEJM Evid, 3 (8), EVIDoa2400056

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Concurrent validity study of QuickDASH with respect to DASH in patients with traumatic upper extremity amputation

BMC Musculoskelet Disord, 25 (1), 86

DOI [10.1186/s12891-024-07183-w](https://doi.org/10.1186/s12891-024-07183-w), PubMed [38263085](https://pubmed.ncbi.nlm.nih.gov/38263085/)

Pyörny J, **Sletten IN**, Jokihaara J (2024)

National trends of upper extremity replantation and revascularization operations in Finland

J Hand Surg Eur Vol, 50 (2), 261-263

DOI [10.1177/17531934241264653](https://doi.org/10.1177/17531934241264653), PubMed [39169766](https://pubmed.ncbi.nlm.nih.gov/39169766/)

Pyörny J, **Sletten IN**, Jokihaara J (2024)

Factors Associated with Unsuccessful Revascularization Surgery in Traumatic Upper-Extremity Amputation





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