



## Center for Implant and Radiostereometric Research Oslo - CIRRO



### Group Leaders

Stephan M. Röhrli, Ass. Prof., ([s.m.rohrl@medisin.uio.no](mailto:s.m.rohrl@medisin.uio.no))

Division of Orthopaedic Surgery, OUH, Head of the Norwegian Society for Hip and Knee Surgery, Board member of the Norwegian arthroplasty Registry



Lars Nordsletten, Prof., Dept of Orthopaedics, UiO

([lars.nordsletten@medisin.uio.no](mailto:lars.nordsletten@medisin.uio.no)) / Oslo Sports Trauma Research Center, Dept of Sports Medicine, Norwegian School of Sports Sciences / Chair of the Orthopaedic Centre, OUH / Head of the Experimental Orthopaedic group, Institute for Surgical Research, OUH ([UXLANO@ous-hf.no](mailto:UXLANO@ous-hf.no))

### Group Members

#### Senior members:

- Finnur Snorrason, MD/PhD, OUH
- Vera Halvorsen, MD, OUH
- Marianne Westberg MDT/PhD, OUH
- Harald Steen, Professor, OUH
- Ragnhild Gundersen, MD radiolog, OUH
- Eirik Aunan, MD, Lillehammer Hospital

#### Alumni (PhD):

- Wender Figwed, MD/PhD Bærum Hospital
- Berte Bøe, MD/PhD, OUH
- Einar Lindalen, MD/PhD Lovisenberg Hospital
- Jon Dahl, MD/PhD, OUH
- Thomas Kibsgård, MD/PhD, OUH
- Bernhard Flatøy, MD/PhD, OUS

#### PhD candidates:

- Justin van Leeuwen, MD, Betanien Hospital
- Gunnar Petursson, MD, Lovisenberg Hospital
- Trygve Glad, MD, OUH, LIS
- Alexander Fraser, MD, OUH, LIS
- Are Stødle, MD, OUH, LIS
- Jan Egil Brattgjerd, MD, OUH, LIS
- Frank David Ørn, MD, Kristiansund Hospital
- Carl Erik Alm, MD, OUH, LIS
- Ole-Christian Brun, MD, OUS
- Vinjar Hansen Myklevoid, MD, OUS
- Peder Thoen, MD Lovisenberg
- Øyvind Tender Øverbø MD, OUS

#### Radiographers:

- Alexis Hinohosa, CT and MRI radiographer, OUH
- Mona Risdal, CT radiographer, Application specialist CT, OUH
- Silje Klausen, BSC radiography, PgCert Reporting Radiography, OUH
- Kathrine Lamark, BSC radiography, MSC Diagnostic imaging, OUH



## Group Members (continued)

Research coordinators:

- Marte Traae Magnusson, PT, Master, OUH
- Anne Christine Brekke, Head nurse, Master, OUH

## Research profile and aims

The overall aim of CIRRO is to perform sophisticated basic and clinical research in the field of implant surgery and bone turnover, establish a team of dedicated researchers and collaborate nationally and internationally. Our intention is:

- To use and develop precise measurement methods (RSA, dynamic RSA and DXA in musculoskeletal research).
- To supervise and help PhD fellows in all connected hospitals/institutions.
- To study new treatment options (implants, surgical techniques, biotechnology, rehabilitation interventions and pharmacological treatment) with precise methods to ensure benefit to patients in a short time.
- 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 that delivers sophisticated services to researchers in South-Eastern Norway Regional Health Authority and adjoint hospitals nationally.

## 2018

In 2018 we have continued to update our RSA systems. We have additionally established the new RSA Adora system at our x-ray lab. We are now able to take single plane dynamic films right next to our usual location which improved our workflow tremendously.

We have continued to recruit patients for our ongoing studies and followed the patients clinically and with RSA. We are proud that 2 new PhD projects have started. One of them is in a international multicenter study project on spinal deformities. CIRRO has the key position and is the initiator although the PhD student, Vinjar Hansen Mycklevold, is supported by the Ph.D program of Haukeland university. We now have started to collaborate closely with Kyoto university, Japan, Skåne universitet, Sweden and nationally Bergen.

The second PhD candidate, Peder Thoen Svenkerud, looks at “patients at risk after THR”. Most clinical data is already collected and we are now designing additional studies with the Norwegian Arthroplasty Registry (NAR).



The highlight of the year was the accomplishment of the PhD program of Bernhard Flatøy with the topic on the “Evaluation of New Implants in Hip Arthroplasty”. This topic has unexpectedly received the adequate high importance through the revelations in the international press through “Implant files”. Prof. Nils Hailer, Sweden, and Prof. Mäkkinen were unisonous in their positive response. We congratulate to a profound book and a nicely performed defence.

3 further PhD students are currently in the finishing phase of their thesis.

## Ongoing projects

### Hip projects

- THR in patients under 20 years (Collaboration with Hip registry in Bergen)
- Randomized study between operation with pins with or without plate for undisplaced dislocated femoral neck fracture. Radio stereogrammetric analysis (RSA) of stability and fracture healing and clinical endpoints. (The Pinloc Study)
- RCT on the function of the Trochanteric Support Plate(TSP) in combination with the Dynamic Hip Screw(DHS)
- Solutions for patients at risk: dislocation, hip spine syndrome.
- The value of minimal invasive approaches for THP compared to traditional ones.

### Knee projects

- Custom positioning guides technique versus conventional technique in total and unikondyler knee arthroplasty (PhD project OUS, Ullevål + Betanien sykehus)
- Computer navigation and conventional technique in total knee replacement (PhD project, Collaboration with Lovisenberg and Bergen)
- In vivo kinematics and performance of contemporary knee arthroplasty (PhD project OUS, Ullevål in collaboration with HF Møre Romsdal)
- Kinematic RSA of three different kneedesignes (Collaboration with Lovisenberg diakonale hospital)

### Methodological projects

- Precision of RSA with different RSA systems
- Phantom study of the hip and the knee during motion
- Motionanalysis with CT.

### Pelvis project

- Movment of the IS joint with long and short spinalfixations.

### Ankle and foot projects

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



### Shoulder projects

- Stability of the glenoid implant in reversed shoulder arthroplasty

### Hand projects

- A prospective randomized trial comparing two different wrist arthroplasties (PhD project OUS, Rikshospital and Ullevål)

## Most important national and international collaborators

### National

- Norwegian Arthroplasty register (NAR)
- Norwegian society for hip and knee surgery (NFHKK)
- Betanien Hospital Skien
- Diakonhjemmet Hospital
- Lillehammer Hospital
- Lovisenberg Diakonale Hospital
- Oslo Sports Trauma Research Center (OSTRC)
- Regional Health Authority Møre-Romsdal
- Kristiansund hospital
- Haukeland University hospital
- Arendal hospital

### International

- Umeå University Hospital, Arthroplasty unit, Sweden
- UmRSA Biomedical, Sweden
- Leiden University, The Netherlands
- Innovationsmanufaktur, München, Germany
- Kyoto University Orthopedic Association, Japan
- Helsinki bone and joint research group, Finland
- Skåne University, Sweden



## Funding

- South-Eastern Norway Regional Health Authority (PhD program)
- Bergen University, (PhD program)
- Oslo University (2 Ph.D program)
- Medacta International AG

## Scientific production of the research group in 2018

Aulie VS, Halvorsen VB, Brox JI (2018)

Motor abilities in 182 children treated for idiopathic clubfoot: a comparison between the traditional and the Ponseti method and controls

J Child Orthop, 12 (4), 383-389

DOI [10.1302/1863-2548.12.170195](https://doi.org/10.1302/1863-2548.12.170195), PubMed [30154930](https://pubmed.ncbi.nlm.nih.gov/30154930/)

Aunan E, Röhrli SM (2018)

No detrimental effect of ligament balancing on functional outcome after total knee arthroplasty: a prospective cohort study on 129 mechanically aligned knees with 3 years' follow-up

Acta Orthop, 89 (5), 548-554

DOI [10.1080/17453674.2018.1485283](https://doi.org/10.1080/17453674.2018.1485283), PubMed [29883259](https://pubmed.ncbi.nlm.nih.gov/29883259/)

Brattgjerd JE, Loferer M, Niratisairak S, Steen H, Strømsøe K (2018)

Increased torsional stability by a novel femoral neck locking plate. The role of plate design and pin configuration in a synthetic bone block model

Clin Biomech (Bristol, Avon), 55, 28-35

DOI [10.1016/j.clinbiomech.2018.03.024](https://doi.org/10.1016/j.clinbiomech.2018.03.024), PubMed [29653317](https://pubmed.ncbi.nlm.nih.gov/29653317/)

Figved W, Svenøy S, Röhrli SM, Dahl J, Nordsletten L, Frihagen F (2018)

Higher cartilage wear in unipolar than bipolar hemiarthroplasties of the hip at 2 years: A randomized controlled radiostereometric study in 19 fit elderly patients with femoral neck fractures

Acta Orthop, 89 (5), 503-508

DOI [10.1080/17453674.2018.1475899](https://doi.org/10.1080/17453674.2018.1475899), PubMed [29790397](https://pubmed.ncbi.nlm.nih.gov/29790397/)

Fraser AN, Tsukanaka M, Fjalestad T, Madsen JE, Röhrli SM (2018)

Model-based RSA is suitable for clinical trials on the glenoid component of reverse total shoulder arthroplasty

J Orthop Res, 36 (12), 3299-3307

DOI [10.1002/jor.24111](https://doi.org/10.1002/jor.24111), PubMed [30035319](https://pubmed.ncbi.nlm.nih.gov/30035319/)

Holm-Glad T, Reigstad O, Tsukanaka M, Røkkum M, Röhrli SM (2018)

High precision and accuracy of model-based RSA for analysis of wrist arthroplasty

J Orthop Res, 36 (11), 3053-3063

DOI [10.1002/jor.24063](https://doi.org/10.1002/jor.24063), PubMed [29873422](https://pubmed.ncbi.nlm.nih.gov/29873422/)



---

Lindalen E, Thoen PS, Nordsetten L, Høvik Ø, Röhrl SM (2018)  
Low wear rate at 6-year follow-up of vitamin E-infused cross-linked polyethylene: a randomised trial using 32- and 36-mm heads  
Hip Int, 1120700018798790 (in press)  
DOI [10.1177/1120700018798790](https://doi.org/10.1177/1120700018798790), PubMed [30227721](https://pubmed.ncbi.nlm.nih.gov/30227721/)

Petursson G, Fenstad AM, Gøthesen Ø, Dyrhovden GS, Hallan G, Röhrl SM, Aamodt A, Furnes O (2018)  
Computer-Assisted Compared with Conventional Total Knee Replacement: A Multicenter Parallel-Group Randomized Controlled Trial  
J Bone Joint Surg Am, 100 (15), 1265-1274  
DOI [10.2106/JBJS.17.01338](https://doi.org/10.2106/JBJS.17.01338), PubMed [30063588](https://pubmed.ncbi.nlm.nih.gov/30063588/)

Stødle AH, Molund M, Nilsen F, Hellund JC, Hvaal K (2018)  
Tibial Nerve Palsy After Lateralizing Calcaneal Osteotomy  
Foot Ankle Spec, 1938640018816363 (in press)  
DOI [10.1177/1938640018816363](https://doi.org/10.1177/1938640018816363), PubMed [30499329](https://pubmed.ncbi.nlm.nih.gov/30499329/)

Øhrn FD, Van Leeuwen J, Tsukanaka M, Röhrl SM (2018)  
A 2-year RSA study of the Vanguard CR total knee system: A randomized controlled trial comparing patient-specific positioning guides with conventional technique  
Acta Orthop, 89 (4), 418-424  
DOI [10.1080/17453674.2018.1470866](https://doi.org/10.1080/17453674.2018.1470866), PubMed [29739264](https://pubmed.ncbi.nlm.nih.gov/29739264/)