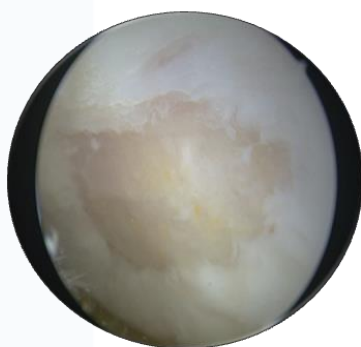


Annual Report 2019

Academic Activities

Department of Orthopaedic Surgery





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ORTHOPAEDIC RESEARCH GROUP

Research Fellows

Asbjørn Årøen (Professor)
Stein Erik Utvåg (Associate Professor)
Per-Henrik Randsborg (Postdoc)
Truls M. Straume-Næsheim (Postdoc)
Aron Adelled (PhD)
Christian Owesen (PhD)
Guri Ranum Ekås (PhD)
Hendrik Fuglesang (PhD)
Inge Skråmm (PhD)
Jan Harald Røtterud (PhD)
Oliver Grundnes (PhD)
Rune Bruhn Jakobsen (PhD)
Svend Ulstein (PhD)
Annette Wikerøy (PhD student)
Christian Pollmann (PhD student)
Ingi Thor Hauksson (PhD student)
Jakob Vangen Nordbø (PhD student)
Max Temmesfeld (PhD student)
Ola-Lars Hammer (PhD student)
Stefan Bartels (PhD student)
Stian Kjennvold (PhD student)
Ståle Myhrvold (PhD student)
Ståle Clementsen (PhD student)
Monica Sailer
Sjur Oppebøen
Sverre Mjønes
Heidi A. Hanvold (Research Coordinator)
Linda Andresen (Research Nurse)
Maria Cocozza (Research Nurse)
Mia Charlotte Emilsen (Research Nurse)
Sofie Høen (Research Nurse)
Torunn Hammer (Research Nurse)
Therese Vårheim Gundersen (Research Nurse)
Trine Fjeld Myhrvold (Research Nurse)
Helene B. Rontén (Med.student)
Katherine Wang (Med.student. Research)
Magnus Aanstad (Med.student)
Milan Duong Nguyen (Med.student)

Head

Professor Asbjørn Årøen

Research positions and PhD students

University employees

Professor II Asbjørn Årøen

Associate Professor Stein Erik Utvåg

D-positions

Christian Pollmann – hip fractures

University candidate with a teaching duty of 100%

Jakob Vangen Nordbø

University candidate with a teaching duty of 50%

Ola-Lars Hammer - distal radius fractures

University candidate with a teaching duty of 30%

Guri Ekås – knee ligament

THE RESEARCH YEAR 2019 IN REVIEW

We are at the end of 2019, and at the starting point of new visions for the group related to the year of 2020. Altogether, 2019 has been a successful year resulting in the accomplishment of three PhDs and the landing of two major external grants. Improvements in 2020 must focus on the three key stones of the research group: Funding, publications and renewal of the group.

1. **Funding.** This is an Achilles for our group and a recurrent issue of frustration among those interested in orthopedic research. Fortunately, death of patients due to orthopedic injuries are less common due to modern treatment offered. A downside of this is that, frequently, our research projects are not a priority for the public research grant funding. Although we considered 2019 as an approved year in this context, the challenge is to repeat this for 2020.
2. **Publications.** The number of publications are in line with the previous years, though there is room for improvement. Our group has still not authored a manuscript published in a high impact journal with impact factor greater than six. New projects in the group inspire us to believe that we can raise the bar regarding publications in high impact journals. Although impact factor is not the only indicator of quality, it is one way to evaluate this. This year the Director of research at the hospital initiated an external evaluation of orthopedic research group resulting in the grading: Fair to good. The grading is probably a correct assessment of our performance today, and it called attention to some of our weaknesses that can be target for improvements in 2020.
3. **Renewal of our research group.** This is critical to make further progress in our achievements, and the evaluation pointed out that the research activity centralizes around few persons. We were aware of this beforehand and has actively encouraged completed PhD students to carry on with research and supervision. Although partly successful, this needs continuous focus. We had three completed PhDs in 2019; the highest number so far.

News: As many of our group members have experienced, the research coordinator has limited capacity in facilitating all the ongoing projects. This has been a problem since October 2019, when two research coordinators ended their engagements in orthopedic clinic. We are enthusiastic about the fact that the problem will be resolved in February 2020, when a new coordinator is joining our group. This will be of major importance for our efforts to complete our goals in 2020 and can be crucial for our achievements in 2020.

We definitely have a great team and many important projects ongoing or at the designing table. Limitations are time, funding and sometimes attention to the findings from our research work. If our success in 2019 continues in 2020, we will be better off next January. Keep up the good work, which surely is of great benefit for our patients.

Best regards,
Professor Asbjørn Årøen

ORTHOPAEDIC RESEARCH COMMITTEE 2019

Head

Associate professor
 Section Chief of Knee and hip fractures
 Dept. of S205 Orthopaedic Nursing, Head
 Dept. of Orthopaedic Surgery, Physician
 Dept. of Orthopaedic Surgery, Physician
 Dept. of Orthopaedic Surgery, Physician
 Dept. of Orthopaedic Surgery, Physician
 Dept. of Orthopaedic Surgery, Physician
 Dept. of Orthopaedic Surgery, Ass. Physician
 Research Coordinator

Asbjørn Årøen

Stein Erik Utvåg
 Stefan Bartels
 Wenche Bjerkestrand Jacobsen
 Truls M. Straume-Næsheim
 Per-Henrik Randsborg
 Rune Bruhn Jakobsen
 Christian Owesen
 Jakob Vangen Nordbø
 Aron Adelved
 Inni S. Figenschou
 Inger Lene Brovold



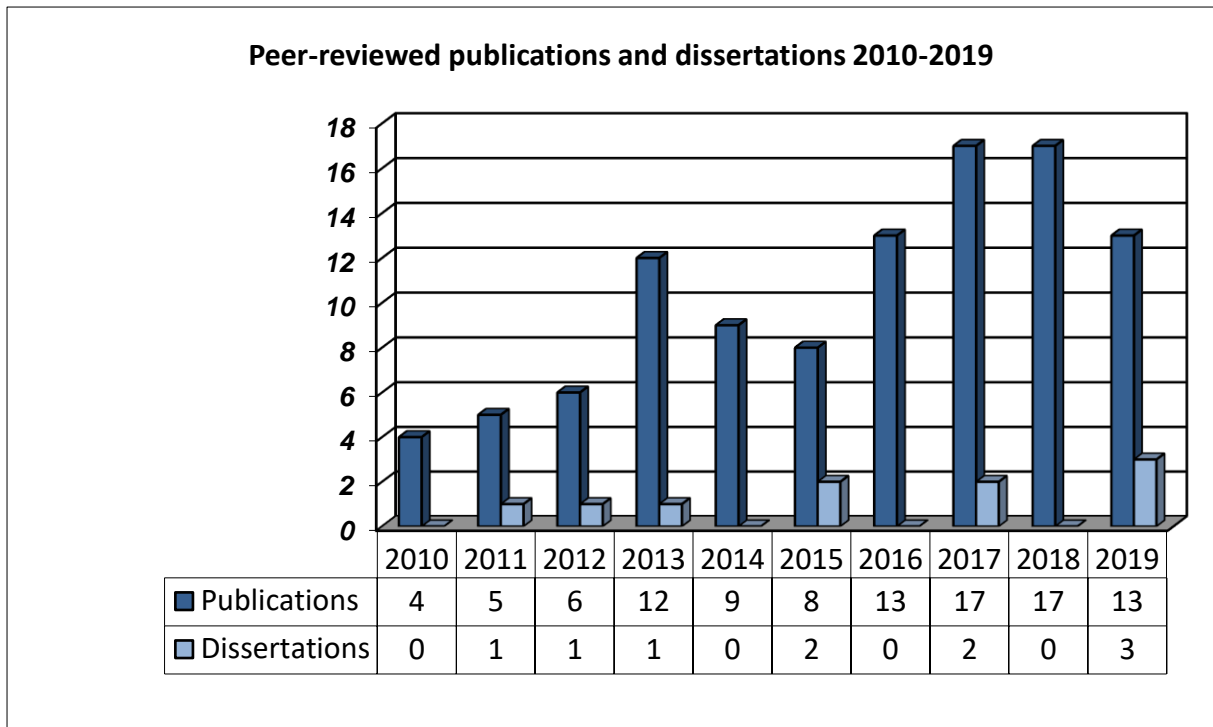
From left: Inni S. Figenschou, Jakob V. Nordbø, Inger Lene Brovold, Wenche B. Bjerkestrand, Stefan Bartels, Aron Adelved, Rune B. Jakobsen and Asbjørn Årøen.

The principal tasks of the committee are to:

- Promote research and research training for all workers in the Orthopaedic Clinic.
- Develop research activities, research quality, and publication frequency within the Orthopaedic Research Group.
- Improve the communication of orthopaedic research and published results from the group.
- Ensure that research is maintained as a high priority within the division.

SUMMARY OF RESEARCH ACTIVITY

Peer-reviewed publications and dissertations of members of the Department of Orthopaedic Surgery 2010-2019.



ORTHOPAEDIC SYMPOSIUM

Treatment and Rehabilitation: challenges with foot and ankle injuries
The Department of Orthopaedic Surgery Research day
Hotel Thon Arena, Lillestrøm, October 11th, 2019.



This year's orthopaedic seminar is the clinic's 6th annual external seminar since 2014. We are proud to maintain good academic and scientific quality at these seminars.

The theme for this year's external research seminar was foot and ankle injuries. Senior consultant for the foot- and ankle surgery at OUS, Kjetil Hvaal, was invited to talk about challenges with operating on the diabetic foot, and gave an inspired and engaging lecture. Furthermore Professor Knut Stavem gave an informative lecture on the correlation and challenges with ankle fractures and high BMI.

The Orthopaedic Clinic has several different ongoing research projects covering injuries in the lower extremities, and we invited our internal lecturers and PhD candidates to tell about the research area that takes place within the orthopaedic research group, Ahus. Interdisciplinary cooperation is important for the orthopaedic research group and we were fortunate to get special physiotherapist Rikard J. Moen to give a lecture on the rehabilitation of Achilles rupture.

This is the fourth year we have applied for and received approval from the Norwegian medical association (NMA) as optional course for physicians in specialization and for specialist post-graduate education. The seminar was fully booked, so this year we took the opportunity to move out of the clinical sphere of the hospital, and into Thon Hotel Arena in



From left: Rikard Moen, Ståle Myhrvold, Tor Kristian Andresen, Monica Sailer, Richard Olsson, Asbjørn Årøen and Max Temmesfeld.

Lillestrøm. The seminar is very popular among physiotherapists, which are one of our key partners. We are also working to attract more general practitioners at these seminars.

The feedback and evaluations from the seminar have been very positive, and we want to continue our annual external seminars, with a new orthopaedic topic every year.

PRIZES AND AWARDS

Orthopaedic research group Best Paper Award 2018

Fuglesang, HFS, Flugsrud, GB, Randsborg, PE, Hammer, OL, Utvåg SE: *Five-Year Follow-up Results of a Randomized Controlled Study Comparing Intramedullary Nailing with Plate Fixation of Completely Displaced Midshaft Fractures of the Clavicle in Adults*. JBJS Open Access d 2018:e0009. <http://dx.doi.org/10.2106/JBJS.OA.18.00009>. Presented at the annual Orthopaedic Research Seminar, May 25.

Charnley Scholarship 2019

Jakob Vangen Nordbø; *Physical activity after Total Hip Arthroplasty*.

The Charnley scholarship of 100 000 NOK from Ortomedic AS at the Norwegian Orthopaedic Society's Autumn Meeting, October 23-25.



RESEARCH FUNDING 2019

Internal Strategic Research Funding, Akershus University Hospital

Stian Kjennvold received 500 000 NOK for the project; *Classification and management of acute and chronic focal cartilage lesions of the knee.*

Ståle Myhrvold received 500 000 NOK for the project; *Treatment results after acute achillestendon rupture: A randomized controlled trial comparing conservative treatment with open and minimally invasive surgery.*

Sophies Minde Ortopedic AS, Grant

Inni S. Figenschou received 330 000 NOK to finance the project; *Functional outcome after fragility fractures of the pelvis in the elderly.*

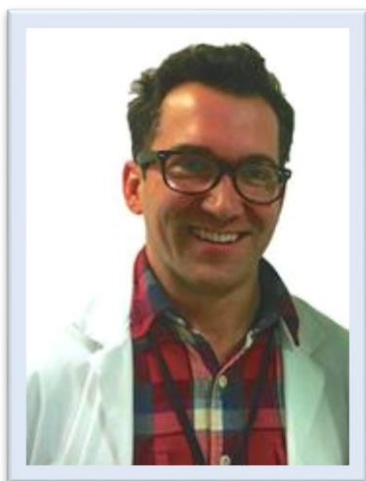
Regional Research Funding, The South-Eastern Norway Regional Health Authority (Helse Sør-Øst)

Asbjørn Årøen and **Stian Kjennvold** received a yearly funding from 2020 to 2026 of 563 000 NOK to finance the PhD-project; *Evaluation and treatment of acute and chronic cartilage lesions of the knee.*

KLINBEFORSK

Rune B. Jakobsen received 17.8 million NOK for the multi-center project; *Improving the treatment of anterior cruciate ligament tears in Norway with register-RCTs – who should have surgery and how should we do it?* from Nasjonalt program for klinisk behandlingsforskning i spesialisthelsetjenesten, KLINBEFORSK.

DISSERTATIONS



Filip C. Dolatowski

Outcomes and complications of nondisplaced femoral neck fracture treated by screw fixation or hip hemiarthroplasty in elderly patients.

*Main supervisor: Associate Professor Stein-Erik Utvåg,
Institute of Clinical Medicine, University of Oslo*

Dissertation: October 31, 2019, Akershus University Hospital

Summary

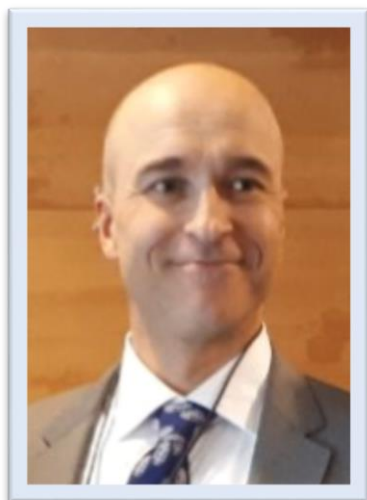
Hip fractures impose vast individual and societal burdens. It is, therefore, crucial to optimize treatment of hip fractures and to identify safe and reliable surgical options, tailored to different age groups and hip fracture types.

The target population was geriatric patients with a nondisplaced femoral neck fracture (FNF). The study aimed to investigate if measurements of the posterior tilt (of the femoral head) assessed by hip radiographs were (1) reliable, (2) valid, and (3) influenced by the positioning of the injured hip during imaging. (4) The study researched if patients with a posterior tilt $\geq 20^\circ$ had an increased risk of needing a second surgery after screw fixation. (5) Finally, it was investigated if geriatric patients with nondisplaced FNF could achieve better outcomes if treated with hemiarthroplasty rather than screw fixation.

The results showed that (1) The reliability among eight surgeons that assessed the posterior tilt of 50 nondisplaced FNFs was good (2) That plain radiographs were valid for the assessment of posterior tilt, as compared to measurements done by 3D CT models (3) The positioning of a 3D-printed FNF model did not systematically affect measurements of posterior tilt during imaging. (4) That a preoperative posterior tilt $\geq 20^\circ$ significantly increased the risk of needing a reoperation, by retrospective analysis of 322 patients treated with screw fixation. (5) Finally, a multi-center randomized controlled trial was conducted to assess the effect of screw fixation versus hip hemiarthroplasty on hip pain and function, mobility, and reoperations in 219 patients aged 70 years and older with nondisplaced FNF.

The findings showed that elderly patients with nondisplaced FNF may benefit from the increased mobility and lower risk of reoperation associated with hemiarthroplasty.

The findings have challenged international guidelines that recommend screw fixation for nondisplaced FNF in older patients, and suggestions of a modification of the current recommendations have been proposed accordingly.



Hendrik Frølich Stange Fuglesang

Functional Outcome after Conservative and Operative Treatment of Midshaft Clavicle Fractures.

*Main supervisor: Associate Professor Stein-Erik Utvåg,
Institute of Clinical Medicine, University of Oslo*

Dissertation: April 11, 2019, Akershus University Hospital

Summary

A fracture of the clavicle is a common occurrence in both children and adults, and occurs usually in the middle third of the shaft. While these fractures traditionally were treated conservatively with a sling, a recent growth of interest has led to more fractures being managed operatively although strong evidence for this approach is lacking.

Paper I and II in this thesis aim to assess the patient reported outcomes after non-operative treatment of midshaft clavicle fractures in adolescents and adults to evaluate to what extent the fracture affects the patient's shoulder function after several years. The first paper in this thesis finds that good to excellent functional outcomes are to be expected after non-operative treatment after clavicle fractures in 10 – 18-year-old patients, whereas the second paper focused only on adults with displaced fractures. Most adult patients have a favorable outcome, but about 25% have functional deficits after treatment with a sling. However, as more patients are being surgically treated: what is the optimal method of fracture fixation?

We randomized 123 adult patients with completely displaced midshaft clavicle fractures to either plate fixation (PF) or elastic stabile intramedullary nailing (ESIN) (paper III and IV). After one year, there was no difference between the methods and most patients returned to their pre-injury shoulder function. In fractures with comminution, PF provided a faster return of shoulder function than ESIN. About half of the ESIN patients were treated with closed reduction, and this group had a better functional outcome the first six months, but had also less pain after 5 years compared to open ESIN and PF. This suggests that if the fracture does not lend itself to closed reduction end ESIN the surgeon should convert to PF. About 1/3rd of the plates were removed during the first five years, mostly due to pain over the implant, compared to 2/3rd of the nails.



Svend Ulstein

Prognosis and treatment of focal cartilage lesions of the knee joint. Medium to long-term results.

Main supervisor: Senior consultant Jan Harald Røtterud, Akershus University Hospital

Dissertation: June 14, 2019, Akershus University Hospital

Summary

The articular cartilage of the knee joint is commonly injured, and the difficulty in treating these injuries has been recognized among orthopaedic surgeons for centuries. A focal cartilage lesion, isolated or concomitant to other intra-articular injuries, may cause pain and disturbed joint function in the often young and active individual.

The present thesis is the result of the ambition to increase the knowledge on the medium-to long-term effects on prognosis of focal cartilage lesions of the knee joint, and the outcome following surgery.

In paper I, the aim was to compare the long-term outcome following two commonly used surgical techniques for isolated cartilage lesions (Microfracture [MF] vs. Osteochondral Autologous Transplantation [OAT]). 25 patients were randomized to MF or OAT. At the 10-year follow-up, both treatment groups reported significant improvements in patient-reported outcome measures (PROMs) from baseline, but no between-group differences in PROMs, muscle strength deficits or radiographic osteoarthritis (OA) were detected.

In papers II-IV, data from the Norwegian and Swedish national knee ligament registries were used to investigate if there were any differences in medium- to long-term PROMs in patients with and without concomitant cartilage lesions at the time of anterior cruciate ligament (ACL) reconstruction (paper II and III), and to investigate the effect of surgical treatment (debridement or MF versus no surgical treatment) of concomitant cartilage lesions (paper IV).

The findings showed that patients with concomitant cartilage lesions improved significantly less than patients without such lesions up to 5 years after ACL-reconstruction, and that the surgical treatment strategy of debridement or MF of concomitant full-thickness cartilage lesions in the setting of ACL-reconstruction conferred no benefit over non-operative treatment.

ONGOING RESEARCH PROJECTS

Upper extremity

Functional outcome after conservative and operative treatment of midshaft clavicle fractures.

Hendrik Frølich Stange Fuglesang MD PhD, Gunnar B Flugsrud MD PhD (Oslo University Hospital) and Stein Erik Utvåg MD PhD Associate professor (Akershus University Hospital and University of Oslo)

The thesis at a glance:

Paper I

Research question: What is the long-term clinical outcome of all clavicle fractures in 10 to 18-year olds?

Material: Retrospective study of 185 patients at AHUS 2006 – 2008 4.7 years after injury. 65 fractures were displaced of which 9 were operated.

Main Findings: Good to excellent outcomes can be expected in most patients.

Paper II

Research question: What are the results of conservative treatment, and is it possible to determine fracture patterns associated with functional deficits?

Material: Retrospective study of 59 patients DMCF 2005 – 2008, 2.7 years after injury.

Main findings: 24% of the patients had reduced functional outcome. A displacement over 100% resulted in less patient satisfaction.

Paper III

Research question: Is there a difference in functional outcomes between PF and ESIN of DMCF?

Material: RCT of 123 patients from 2009 – 2012. Follow-up 12 months

Main findings: No differences in FO after 12 months. PF faster recovery than ESIN in comminuted fractures.

Paper IV

Research question: Is there a difference in outcomes, implant removal or sequelae 5 years after adult DMCF treated with PF or ESIN?

Material: Same RCT as III. 66-month follow-up of 114 patients

Main findings: No differences in FO. Less sequelae in closed ESIN. More implant removals in ESIN

DMCF: Displaced Midshaft Clavicle Fracture, PF: Plate Fixation, ESIN: Elastic Stable Intramedullary Nailing, FO: Functional Outcome

Current status: All studies are published and Hendrik FS Fuglesang successfully defended the thesis; *Functional outcome after conservative and operative treatment of midshaft clavicle fractures*, april 11 2019.

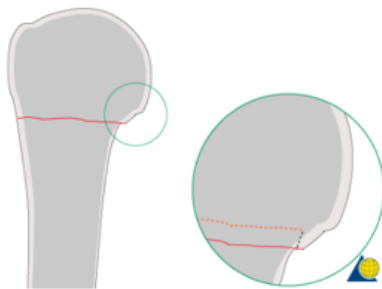
Funding:

Ahus Internal Strategical Research Funding 2016	150 000 NOK
Ahus Department of Orthopaedic Surgery Publication Funding 2015	10 000 NOK
Sophies Minde Ortopedic AS Grant 2013	280 000 NOK
<u>Ahus Internal Strategical Research Funding 2010</u>	<u>180 000 NOK</u>
<u>Total Funding:</u>	<u>620 000 NOK</u>

Plate fixation versus intramedullary nailing of 3 and 4 part proximal humerus fractures. A prospective, double blinded randomized controlled trial.

Annette K.B. Wikerøy MD PhD student, Per Henrik Randsborg MD PhD, Hendrik S.F. Fuglesang MD PhD, Rune Bruhn Jakobsen MD PhD

Introduction: The population is ageing and the incidence of proximal humerus fractures (PHF) is increasing. New angle-stable implants give better stability for complex osteoporotic fractures, thus more fractures are treated surgically. The most common complications are related to the osteosynthesis-material: varus failure (4-14%) or penetration of screws through the cartilage in the shoulder joint. The commonest implant used in Norway is the locking stable plate, but many other countries use locking stable nails. The two methods seem to have comparable functional results; there may be a slight higher complication rate in the plates. Both implants require adequate reduction; they provide fixation options for stabilizing the tuberosity's and the calcar.



The medial hinge/ calcar or the metaphyseal column illustrated within the green circle

The nails may add additional stability hindering varus failure when introduced flush or just below the cartilage surface. The locking plate may stabilize the tuberosities more rigid and it provides more angle stable screws in the humeral head to hinder osteosynthesis failure. We wish to conduct a prospective randomized controlled trial to compare nail versus plate fixation in 3 and 4 part PHFs. These two well established methods have not been compared in a level one manner.

Aim: The aim is to compare the operative treatment of 3 and 4 part fractures of the shoulder with angle stable plates or nails in light of clinical and radiological results during 2 years. The project is part of Dr. Wikerøy's planned PhD.

Primary aim: Functional outcome of surgical treatment as evaluated by the DASH score at follow-up. Secondary aims: Registration of radiological complications defined by a reduction of Head Shaft-Angle (HSA) of $\geq 10^\circ$ in frontal plane or screw penetration/cut-out, screw failure or failure of the osteosynthesis on radiographs within two years.

Initial radiographic examination performed with standardized radiograph projections; true anterior-posterior projection and scapula projection pre- and post-operative. Computer tomographic (CT) scans before and after surgery will help clarify classification, fracture configuration and results. The HSA varies between 120-140° in the normal population, so we will take front radiographs of opposite proximal humerus of all included patients to act as their own control. Functional outcome of surgical treatment as evaluated by the Constant score by independent and blinded physiotherapists during follow-up. Measurement of strength performed according to recommendations given by the European Society of Shoulder and Elbow Surgeons ESSSE (<http://secec.org/>). EQ-5D, a generic measure of health statuses that provide a simple descriptive profile used in clinical evaluation of health care. Health economic registration; length of hospital stay, sick leaves, use of physiotherapy, appointments at general practitioners, extra controls at in-patient orthopaedic clinic, removal of plate or nail, extra surgeries. Implant costs, theatre time. Monitoring complications such as deep or superficial infection, avascular necrosis, nerve or vessel-damage and DVTs. We will also invite patients to attend a 5 year and 10 year follow up appointment. During these late controls, all the primary and secondary outcomes as described above.

Materials and methods: This is a single-centred randomized controlled trial (RCT). Patients admitted to AHUS from 01.10.16 to 01.10.19 with a displaced 3 or 4-part proximal humeral fracture of OTA/ AO group 11B2 or 11C2 in need of surgical treatment will be randomly allocated to two groups; intramedullary nailing or angular stable plate fixation.

Status: At this point, 53 patients are included in the study.

Funding:

Ahus Internal Strategic Research Funding 2018	217 500 NOK
Sofies Minde Orthopaedic AS, Grant 2018	349 725 NOK
Ahus Internal Strategic Research Funding 2017	150 000 NOK
Sofies Minde Orthopaedic AS, Grant 2017	389 000 NOK
Ahus Department of Orthopaedic Surgery Publication Funding	20 000 NOK
Norwegian, Orthopaedic Society, Research Grant 2016	50 000 NOK
Smith and Nephew's Research Scholarship 2016	25 000 NOK
Total funding:	1 201 225 NOK

“Radius C-study” -Volar locked plating versus bridging external fixation.

Ola-Lars Hammer MD PhD student, Jan Erik Madsen MD Professor (Oslo University Hospital), Ståle Clementsen MD PhD student, Per-Henrik Randsborg MD PhD.

Introduction: Earlier, the standard method of fixation of the most comminuted distal radius fractures was an external fixation supplemented by K-wires. Since the development of the volar locking plate technology, a new approach to the treatment of these fractures has gained popularity worldwide. Over the past couple of years, the volar locking plate has achieved dominance in the treatment of most fractures of the distal radius. This has occurred without the backing of large prospective, randomized studies. There is to date little

solid scientific data to support this drastic change in treatment rationale. External fixation and volar locking plates differ widely in operative technique, duration of immobilization postoperatively and potential complications. The newer implants are also significantly more expensive than the established option of external fixation.

Aim: We hope to disclose the various benefits and possible drawbacks of volar locked plating versus augmented external fixation and hopefully make a recommendation for a treatment rationale. A secondary aim of our study is to thoroughly examine the cost of volar locked plating versus augmented external fixation.

Materials and methods: We have designed a randomized, prospective study for comparison of volar locked plating versus Hoffman II bridging external fixation supplemented by K-wire fixation in patients with comminuted distal radius fractures, AO/OTA type C2 and C3. On the basis of power analysis, a total of 166 patients are to be included in this project. The follow-up period is two years and evaluation is based on x-ray analysis, grip strength, range of movement, pain and various tools to measure quality of life and satisfaction with the treatment (EQ-5d, SF-36, QuickDASH).

Current status: By February 2015, two-year follow-up of all patients was concluded. The authors spent 2016 finishing the database, entering a substantial amount of data and performing the statistical analysis.

During 2018 the first publication was completed. The second publication, focusing on the cost-benefit of surgical interventions following wrist fractures was submitted in 2019. The third publication focusing on Patient Rated Outcome Measures was submitted in 2020. Both of these publications are currently under review, acceptance is pending.

Publications: The first publication was published in JBJS February 2019 edition.

The two articles currently under review are:

1. The Cost-effectiveness of Volar Locking Plate compared to Augmented External Fixation In Displaced Intra-articular Wrist Fractures
2. Does Generic Patient Rated Outcome Measurements Reflect Function of the Upper Extremity Following Surgical Treatment of a Wrist Fracture

Funding:

Ahus Internal Strategical Research Funding 2015	100 000 NOK
<u>Ahus Internal Strategical Research Funding 2011</u>	<u>100 000 NOK</u>
<u>Total Funding:</u>	<u>200 000 NOK</u>

“The Mobilization Study” - The value of early mobilization and physiotherapy following wrist fractures treated by volar plating.

Ståle Clementsen MD PhD student, Per Henrik Randsborg MD PhD, Ola Lars Hammer MD PhD student.

Introduction: At Akershus University Hospital the standard regimen following surgery with volar locking plates

after wrist fractures is immobilization in a cast for 2 days and then non-weight-bearing home exercises for the next 6 weeks. At other hospitals, a longer course of post-operative immobilization is standard practice, most often a cast for 2-3 weeks. The use of physiotherapy in the post-operative phase also varies, and the use of physiotherapy at our hospital is most often left to the individual surgeon, whereas it at other facilities is part of the standard follow-up regimen.

There is no solid scientific data supporting a preference for neither late nor early mobilization following a distal radius fracture. Although the idea of early movement seems appealing and wanted, the benefits of this have yet to be proven by objective measures. On the other side, no harmful effect has been demonstrated by non-weight-bearing exercises. The use of physiotherapy is widespread, but again the benefits are not measurable in the long term.

Aim: 1. We hope to disclose the various benefits and possible drawbacks of early mobilization, weight-bearing exercises and physiotherapy versus late mobilization and home exercises alone and hopefully make a recommendation for a postoperative treatment rationale.

2. A secondary aim for our study is to examine the cost-benefit of the two possible postoperative regimens.

Materials and methods: We have designed a randomized, prospective study for comparison of early mobilization and physiotherapy versus late mobilization and home exercises following surgery with a volar locking plate for AO/OTA type A extra-articular fractures. On the basis of power analysis, a total of 124 patients are to be included in this project. The follow-up period is two years and evaluation is based on x-ray analysis, grip strength, range of movement, pain and various tools to measure quality of life and patient satisfaction with the treatment (EQ-5d, QuickDASH).

Current status: Complete follow-up of all patients was concluded in April 2016. These are now being entered into the database.

Publications: The first submission was published in JBJS OA July 2019. Two additional publications will be submitted during 2020.

Funding:

Ahus Department of Orthopaedic Surgery Publication Funding 2019

20 000 NOK

Current management of radius fractures viewed in perspective of patient complaints forwarded to The Norwegian System of Patient Injury Compensation.

Ståle Clementsen MD, Per Henrik Randsborg MD PhD, Erik Engebretsen MD, Ola-Lars Hammer MD PhD student.

Introduction: A review of all patient complaint claims forwarded to The Norwegian System of Patient Injury Compensation (NPE) from 2000 through 2013 after treatment for distal radius fractures (ICD-10 S52.5) was conducted.

Aim: Identify the most common causes for compensation granted due to patients' complaints following treatment of distal radial fractures in Norway. Both surgically and nonsurgically treated fractures are included in the analysis.

The main purpose of the study is to find pearls and pitfalls regarding how to avoid complications when treating fractures of the distal radius. A second aim is to estimate whether the rate or type of complaints changed during the decade when surgical treatment shifted from mainly percutaneous pinning and external fixation to volar locking plates. Last, the study will provide a consideration of what is considered acceptable in terms of poor outcome/complications following treatment of distal radius fractures, as viewed by The Norwegian Ministry of Health and Care.

Materials and methods: Data collected from NPE (n=800) will be analyzed for type of fracture, type of initial (primary) treatment, type of complaint, reason for granted compensation and reason for rejected claims.

Current status: The study is completed and published in an open access journal in 2018.

Funding:

Ahus Department of Orthopaedic Surgery Publication Funding 2018

20 000 NOK

Lower extremity

Screw fixation versus hemiarthroplasty for undisplaced femoral neck fractures in elderly patients: a multicenter randomized controlled trial.

Filip C. Dolatowski MD PhD student, Frede Frihagen MD PhD, Stefan Bartels MD, Vidar Opland MD (Bærum Hospital, Vestre Viken Hospital Trust), Jūratė Šaltytė Benth PhD, Ove Talsnes MD PhD (Elverum Hospital, Innlandet Hospital Trust), Sigurd Erik Hoelsbrekken MD PhD (LHL Hospital Gardermoen) and Stein Erik Utvåg MD PhD.

Background: Elderly patients with a displaced femoral neck fracture treated with hip arthroplasty may have better function than those treated with internal fixation. We hypothesized that hemiarthroplasty would be superior to screw fixation with regard to hip function, mobility, pain, quality of life, and the risk of a reoperation in elderly patients with a nondisplaced femoral neck fracture.

Methods: In a multicenter randomized controlled trial (RCT), Norwegian patients' ≥ 70 years of age with a nondisplaced femoral neck fracture were allocated to screw fixation or hemiarthroplasty. Assessors blinded to the type of treatment evaluated hip function with the Harris hip score (HHS) as the primary outcome as well as on the basis of mobility assessed with the timed "Up & Go" (TUG) test, pain as assessed on a numerical rating scale, and quality of life as assessed with the EuroQol-5 Dimension-3 Level (EQ-5D) at 3, 12, and 24

months post-surgery. Results, including reoperations, were assessed with intention-to-treat analysis.

Results: Between February 6, 2012, and February 6, 2015, 111 patients were allocated to screw fixation and 108, to hemiarthroplasty. At the time of follow-up, there was no significant difference in hip function between the screw fixation and hemiarthroplasty groups, with a 24-month HHS (and standard deviation) of 74 ± 19 and 76 ± 17 , respectively, and an adjusted mean difference of -2 (95% confidence interval [CI] = -6 to 3 ; $p = 0.499$). Patients allocated to hemiarthroplasty were more mobile than those allocated to screw fixation (24-month TUG = 16.6 ± 9.5 versus 20.4 ± 12.8 seconds; adjusted mean difference = 6.2 seconds [95% CI = 1.9 to 10.5 seconds]; $p = 0.004$). Furthermore, screw fixation was a risk factor for a major reoperation, which was performed in 20% (22) of 110 patients who underwent screw fixation versus 5% (5) of 108 who underwent hemiarthroplasty (relative risk reduction [RRR] = 3.3 [95% CI = 0.7 to 10.0]; number needed to harm [NNH] = 6.5 ; $p = 0.002$). The 24-month mortality rate was 36% (40 of 111) for patients allocated to internal fixation and 26% (28 of 108) for those allocated to hemiarthroplasty (RRR = 0.4 [95% CI = -0.1 to 1.1]; $p = 0.11$). Two patients were lost to follow-up.

Conclusions: In this multicenter RCT, hemiarthroplasty was not found to be superior to screw fixation in re-establishing hip function as measured by the HHS (the primary outcome). However, hemiarthroplasty led to improved mobility and fewer major reoperations. The findings suggest that certain elderly patients with a nondisplaced femoral neck fracture may benefit from being treated with a latest-generation hemiarthroplasty rather than screw fixation.

Publication Current status: Accepted during September, 2018, by The Journal of Bone & Joint Surgery.

Fast-track hip fracture—an optimized patient pathway for hip fracture patients.

Christian Pollmann MD, Akershus University Hospital, Johan Halse MD, Akershus University Hospital; **Stefan Bartels MD**, Akershus University Hospital; **Truls Straume-Næsheim MD, PhD**, Akershus University Hospital; **Jan-Harald Røtterud MD PhD**, Akershus University Hospital; **Olav Lenvik**, Akershus University Hospital; **Fredrik Dahl**, Akershus University Hospital; **Jan Erik Gjertsen, MD PhD**, Haukeland University Hospital and Norwegian Hip Fracture Register; **Asbjørn Årøen MD Prof.**, Akershus University Hospital

Introduction: Elderly patients with a hip fracture have a 30-day mortality of up to 11%, and a one-year mortality of over 30% has been reported. In addition, the injury causes significant morbidity and only about 60% of the patients return to their pre-fall level of functional independence. Orthopaedic research has mainly focused on operative techniques with little impact on morbidity and mortality. A fast-track patient pathway with focus on multimodal pain relief, stress reduction, early mobilization and nutrition constitutes a more holistic approach to the treatment of hip-fracture patients and should be suited to benefit this frail group of patients.

Aim: To elucidate the impact of a fast-track pathway for hip-fracture patients on mortality.

Materials and methods: Mortality, rates of reoperation and surgical site infections are compared for a patient cohort before and after introduction of a fast-track pathway for hip fracture patients.

Current status: Database completed; 1 article published; 1 manuscript submitted.

Funding:

Sophie's Minde Ortopedic AS, Grant 2014	225 000 NOK
Heraeus Medical 2014	50 000 NOK
Total Funding:	275 000 NOK

Debridement, antibiotics and implant retention (DAIR) for infected total hip arthroplasty- does the operative approach influence the functional result?

Christian Pollmann, MD, Akershus University Hospital, Asbjørn Årøen, MD, Prof., Akershus University Hospital

Research group: Geir Hallan MD, PhD, Haukeland University Hospital and Norwegian Arthroplasty Register; Håvard Dale, MD, PhD, Haukeland University Hospital and Norwegian Arthroplasty Register; Eva Hansen Dybvik, PhD, Norwegian Arthroplasty Register; Jan Erik Gjertsen, MD, PhD, Haukeland University Hospital and Norwegian Hip Fracture Register

Introduction: Infection of a total hip arthroplasty is a dreaded complication. DAIR (debridement, antibiotics and implant retention) has been shown to have a good success rate in early infections with stable implants and better functional results than two-stage revisions. In patients where infections control was achieved with just one DAIR procedure the functional result was comparable to uncomplicated primary hip arthroplasties. However, it is not known if the operative approach during the primary operation and the DAIR procedure have an influence on this functional result.

Aim: The project's aim is to investigate if the operative approach (transgluteal or posterior approach) to the hip joint under the primary arthroplasty and the revision procedure has an influence on the functional result after DAIR for infected arthroplasty of the hip.

Materials and methods: All patients who have been operated once with a DAIR procedure and where the same operative approach has been used during the primary and the revision procedure will be identified in the Norwegian Arthroplasty Register. These patients will be contacted by mail and be asked to complete three-questionnaires. The answers from the questionnaires and the data from the Norwegian Arthroplasty Register will be used in a multiple regression analysis to determine if there is a difference in the outcome measures between the groups. The main outcome measure will be the function subscale of the Western Ontario and McMaster Universities osteoarthritis index (WOMAC).

Current status: Questionnaires have been sent to all potential participants. The response rate after a reminder was 61 %. A database has been completed and data analysis has started.

Funding:

Ortomedic AS 2016

100 000 NOK

Molecular and imaging biomarkers in delirium and dementia

Main researcher: Leiv Otto Watne, MD, PhD, Oslo University Hospital, Ullevaal

Research group: **Christian Pollmann**, MD; Asbjørn Årøen, MD, Prof.; Torunn Hammer; Sofie Høen; Linda Andresen, Akershus University Hospital

Introduction: Delirium is characterized by sudden impairment in awareness and cognition, and is a common complication to acute somatic illness in the elderly. There is evidence that delirium can precipitate dementia in patients that are previously cognitively intact, and accelerate deterioration in those who already are demented. However, the pathophysiology of delirium is still poorly understood.

Hip fracture patients are well suited to study delirium. On the one hand this frail patient group is at a high risk of developing delirium. On the other hand the majority of hip fracture patients are operated in spinal anesthesia which facilitates the procurement of cerebrospinal fluid. In contrast to blood, cerebrospinal fluid is in close contact with the brain's neurons. The analysis of cerebrospinal fluid can therefore give important information on the pathophysiologic mechanisms in the brain that lead to delirium.

Aim: To elucidate pathophysiologic mechanisms in delirium.

Materials and methods: Prospective observational study. Cerebrospinal fluid and blood samples are collected from hip fracture patients that are operated in spinal anesthesia. Patients are assessed for prefracture cognitive status and general health and are followed daily during their hospital stay to detect the development of delirium.

Current status: 174 patients have been included in the study. The aim is to include a total of 200 patients.

Funding: The expenses at AHUS are covered by research grants obtained by Leiv Otto Watne, MD, PhD, Oslo University Hospital, Ullevaal.

Treatment and functional outcome in patients with displaced femoral neck fractures younger than 70 years.

Stefan Bartels, PhD student; PhD Stein Erik Utvåg; PhD Frede Frihagen, Department of Orthopaedic Surgery, Oslo University Hospital; PhD Jan - Erik Gjertsen, Norwegian Hip Fracture Register, Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Department of Clinical Sciences, University of Bergen; PhD Cecilia Rogmark, academic advisor, Department of Orthopaedic Surgery, Skåne University Hospital Malmö

and University of Lund, Sweden; PhD Wender Figved, Department of Orthopaedic Surgery, Bærum Hospital; Filip Dolatowski, PhD student; PhD Torbjørn Kristensen, Department of Orthopaedic Surgery Haukeland University Hospital, Bergen.

Introduction: Patients younger than 70 years with a displaced femoral neck are in serious conditions. The femoral neck fracture (FNF) is associated with low activity levels, hip pain and substantially reduced quality of life. In this study we aim to answer if patients aged 55 - 70 years with displaced and low-energy FNF treated with a total hip arthroplasty (THA) leads to better functional outcome than osteosynthesis and can patient-related factors be identified that predispose for FNF?

Aim: Map the functional outcome and complications associated with displaced low-energy FNF in patients under 70 years of age treated in the period January 2005 - December 2012 (2017) in Norway.

Map bone density measured with DEXA and patient - related factors that predispose for displaced FNF for patients aged 55 - 70 years. In a randomized multicenter study, map complications and functional outcome after osteosynthesis or THA in patients aged 55 - 70 years with displaced FNF.

Materials and methods: Part I. In cooperation with the Norwegian Hip Fracture Registry, we published data about treatment methods and functional outcome for patients aged 55 - 70 years with displaced FNFs in the period January 2005 - December 2012. *Finished*

In **Part II** 50 patients aged 55 - 70 years with displaced low - energy FNF will be measured with DEXA. The results will be compared with those for an age and sex - matched normal population (150 persons). *Finished*

Part III Treatment and functional outcome in patients under 55 years with displaced femoral neck fracture - An observational study of 962 patients reported to *the Norwegian Hip Fracture Register* from January 2005 - December 2017 *In progress, data processing in progress, waiting for data from NHFR*

Part IV randomized multicenter study of patients operated with either total hip replacement (THA) or osteosynthesis (IF) where functional outcome, complications and reoperations are compared for the 2 groups. *Controls in progress, finished in dec. 2020*

Funding:

Internal strategic research funding Ahus 2014	210 000 NOK
Sophie's Minde Orthopedic AS Grant 2015	670 000 NOK
Sophie's Minde Orthopedic AS Grant 2014	670 000 NOK
<u>Strategic research funding (publication) 2013</u>	<u>30 000 NOK</u>
<u>Total funding:</u>	<u>1 580 000 NOK</u>

Anterior Cruciate Ligament reconstruction and concomitant focal cartilage lesions: Prognosis and treatment; a systematic review.

Svend Ulstein MD PhD student, **Asbjørn Årøen** MD PhD, **Einar Sivertsen** MD (Diakonhjemmet Hospital), **Jan Harald Røtterud** MD PhD.

Introduction: The coincidence of Anterior Cruciate Ligament (ACL) tears and focal articular cartilage damage is common. The current literature is conflicting as to the prognosis and treatment of choice after such combined injury.

Aim: To perform a systematic review of the current literature on the prognosis after combined surgical treatment of ACL and focal cartilage injury to support evidence-based clinical decisions and improve patient outcomes.

Materials and Methods: Perform a computer-based systematic search (MEDLINE via PubMed, EMBASE via OvidSP, Cochrane Library, Web of Science databases) to identify all published literature reporting prognosis and/or treatment of combined ACL-injury and focal cartilage lesions. Systematic review of eligible studies identified in the systematic search by standardized data extraction and quality assessment. If sufficient homogeneity exist (prognosis and/or treatment) in outcome measures across included studies, a metaanalysis will be performed. In the case of considerable heterogeneity, a best-evidence synthesis will be used.

Current Status: Project registered in PROSPERO databases. Systematic search designed and performed (December 2017) and data are being analyzed in Distiller SR.

Funding:

Ahus Department of Orthopaedic Surgery Publication Funding

12 000 NOK

Norwegian Cartilage Project NCP - Microfracture Study

Tommy Aae MD PhD (Kristiansund Hospital), **Asbjørn Årøen** MD PhD, **Per-Henrik Randsborg**, MD PhD, **Christian Owesen** MD PhD, **Heidi Hanvold** PT.

The NCP is a national multicenter research group headed by Professor **Asbjørn Årøen** and assisted by post doc **Per-Henrik Randsborg** (until august 2019) and post doc **Christian Owesen** (from August 2019) at Ahus. It includes eight different hospitals in four health regions of Norway, and the projects include two RCTs, a register study and basic science studies.

Introduction: Focal cartilage lesions in adults are common, and affect young adults. The treatment is difficult, and no current gold standard is established. Microfracture has been recommended for smaller lesions, but has never been compared with physiotherapy alone.

Aim: The aim is to compare Microfracture with arthroscopic debridement and physiotherapy.

Materials and methods: Patients aged 18-50 with isolated grade III or IV cartilage lesions of the femoral condyles or trochlea less than 2 cm² are prospectively randomized to receive either Microfracture or arthroscopic debridement. 114 patients will be included in 7 different hospitals (Ahus, Ullevål, Diakonhjemmet, Kristiansund, Ålesund, Haukeland and Haraldsplass).

Current status: Recruiting patients. 47 of 114 patients are included.

Planned Publications:

1. Microfracture vs Debridement of isolated cartilage defect of the knee, a multicenter RCT.
2. The costs of Microfracture vs debridement of cartilage defects of the knee in patients aged 18-50 years.
3. Biomarkers for successful cartilage healing after microfracture.

Funding:

Helseforsk, 2015

19 000 000 NOK

Norwegian Cartilage Project NCP - Autologous Chondrocyte Implantation Study (ACI study).

Asbjørn Årøen MD PhD, **Per-Henrik Randsborg** MD PhD, Christian Owesen MD PhD, Heidi Hanvold PT, Jan Brinchmann MD PhD (Rikshospitalet), Lars Engebretsen MD PhD (Ullevål University Hospital).

The NCP is a national multicenter research group headed by Professor Asbjørn Årøen and assisted by post doc Per-Henrik Randsborg (until august 2019) and post doc Christian Owesen (from August 2019) at Ahus. It includes eight different hospitals in four health regions of Norway, and the projects include two RCTs, a register study and basic science studies.

Introduction: Focal cartilage lesions in adults are common, and affect young adults. The treatment is difficult, and no current gold standard is established. Autologous Chondrocyte Implantation (ACI) has been recommended for larger lesions, but has never been compared with physiotherapy alone.

Aim: The aim is to compare ACI with arthroscopic debridement and physiotherapy.

Materials and methods: Patients aged 18-50 with isolated grade III or IV cartilage lesions of the femoral condyles or trochlea larger than 2 cm² are prospectively randomized to receive either ACI or arthroscopic debridement. 82 patients will be included, and the patients will be treated at Ahus or OUS/Ullevål, and followed up at a designated research clinic at Ahus.

Current status: Recruiting and treating patients currently. 25 of 82 patients are included.

Planned Publications:

1. ACI vs Debridement of isolated cartilage defect of the knee, a RCT.
2. The costs of ACI vs debridement of cartilage defects of the knee in patients aged 18-50 years.
3. Biomarkers for successful cartilage healing after ACI.

Funding:

Helseforsk, 2015

19 000 000 NOK

Reconstruction of the medial patellofemoral ligament versus conservative treatment of chronic patellar instability. An RCT.

Main researcher: **Truls M. Straume-Næsheim**, MD, PhD, Postdoc project, Akershus University Hospital, Hugesund Sanitetsforenings Reumatismesykehus
Supervisor: Asbjørn Årøen, MD, Prof., Akershus University Hospital
Research group: Brian Devitt, MD, FRCS, MMedSc, OrthoSport Victoria, Melbourne, Australia; Je Brand, MD, Heartland Orthopedics, Alexandria, MN, US; Einar Sivertsen, MD, PhD, Marna Hansen's Hospital; Jan Rune Mikaelson, MD, Akershus University Hospital

Introduction: Patella dislocation is a serious knee injury whose peak incidence occurs in patients aged 10–17 years and is associated with a high rate of re-dislocation. Knee injuries frequently cause long-term disability and reduced physical activity among adolescents and young persons. Surgery in this patient group requires a low tolerance for complications, meaning that physical therapy might offer more successful outcomes in many knee injury cases. The proposed project studies a particular patient cohort subjected to recurrent dislocation of the patella.

Aim: The principal objective of this clinical, randomized controlled trial is to evaluate and compare knee function and symptoms in patients with recurrent patella dislocation randomized into treatment with surgical reconstruction of the medial patellofemoral ligament (MPFL) with those of patients in a standardized physiotherapy program designed to stabilize the patella and improve patient function.

Materials and methods: Patients aged 12–30 years who have experienced two or more patella dislocations are randomized into groups receiving either MPFL reconstruction or physical therapy only. Follow-ups at 3, 6, 12, and 36 months involve functional tests, validated knee scores, arthroscopic examination, and cartilage-specific MRI protocols for the knee.

Current status: The recruitment of patients has been finalised with a total of 60 patients included. The patients will be followed for three years. The first paper assessing the baseline data has recently been resubmitted. Preliminary 1 year data was presented at the biannual meeting of the European Society for Sports Traumatology, Knee Surgery and Arthroscopy in Glasgow in May 2018.

Planned publication plan:

1. Objective measure of knee function in patients with recurrent patella dislocation.
2. Knee function and level of activity in patients with recurrent patella dislocation treated with MPFL: Reconstruction and active rehabilitation at two-year follow-up.
3. Knee function and level of activity in patients with recurrent patella dislocation treated with MPFL reconstruction or active rehabilitation at three-year follow-up: A randomized clinical trial.
4. Patient benefits after knee ligaments surgery: Which ligament surgery is most effective? MPFL reconstruction and ACL reconstruction at three-year follow-up evaluated with knee injury and osteoarthritis outcome scores (KOOS).
5. MRI assessment of cartilage structure in the patellofemoral joint in a randomized clinical trial of MPFL reconstruction versus more conservative treatment.

Funding:

Sophie's Minde Ortopedic AS, 2011–2016	500 000 NOK
Aase Bye and Trygve J. B. Hoff's Fund, 2014	17 000 NOK
The Norwegian Association of Sports Medicine, Research Grant 2015	50 000 NOK
South-Eastern Norway Regional Health Authority, Postdoc grant 2016–2017 per year	500 000 NOK
<u>Overseas grant</u>	<u>386 000 NOK</u>
<u>Total Funding:</u>	<u>1 453 000 NOK</u>

Classification and management of acute and chronic focal cartilage lesions of the knee.

Stian Kjennvold MD, Per-Henrik Randsborg MD PhD, Asbjørn Årøen MD Professor.

Project 1: Re-fixation of acute chondral fractures

Introduction: Focal chondral defects of the knee are common, especially in the young part of the population. The hyaline cartilage of joints has a limited potential to heal and focal disruption of this surface have been shown to impair quality of life similar to patients scheduled for knee replacement. Although the natural history of these cartilage lesions has not been finally outlined we do know that they can lead to early onset osteoarthritis. The patients are however 30 years younger. Treatment of symptomatic chondral injuries in the knee is therefore of importance to the patient as well as society.

Several improvements in cartilage restoration techniques have been developed over the last decades, but none has so far proved to be superior to others in properly conducted randomized trials. Current surgical strategies range from simple debridement or micro-fracture to chondrocyte implantation (ACI) and stem cell therapy (MSC). However, all methods have their shortcomings, and a thorough review of the cartilage repair methods has verified that no conclusion could be made on optimal treatment of these injuries. The only known method that preserves the joint hyaline cartilage is re-fixation of the loose fragment in acute injuries. This technique is only described in a few single case series and the functional outcome of this treatment is poorly established. We have treated a small number of patients with re-fixation of acute chondral fractures and we need to critically and systematically evaluate the results in a scientific manner to determine the indication,

limitations and expected outcome after this treatment. Although it is a case cohort with a limited number of patients, our study will comprise the largest case series to date, and the findings will pave way for further improvement in the surgical management of these difficult knee injuries.

Aim: To determine the clinical-, patient reported-, and radiological (MRI) outcomes after acute fixation of chondral fractures. The resulting article will also serve as a description of the surgical technique.

Materials and methods: This study is a retrospective cohort study. Inclusion criteria include patients older than 16 years at the time of clinical evaluation who have previously undergone an acute fixation of an isolated chondral fracture of the knee with meniscal arrows at our hospital. The patients will be identified from our internal medical record system and will be invited to a designated follow-up clinic at our institution. The only exclusion criterion is patients declining participation. A combination of clinical parameters, questionnaires and radiological examination will be used for follow-up.

To assess clinical function the patients will perform a validated single leg hop test and range of motion (ROM) will be measured with a goniometer. Patients will also provide information about return to work, to physical activity and to sport. Complications or reoperations will be registered. A standard visual analogue scale will be used to quantify pain. Standard Synflex x-ray pictures of both knees will be performed to look for signs of osteoarthritis whereas Magnetic Resonance Imaging will be used to assess the healing of the defect and the quality of the cartilage. Specific questionnaires will be completed by the patients before examination and include: KOOS, Tegner, Lysholm and EQ-5D.

Current status: Inclusion and examination of the patients are completed and processing of data is ongoing. Submission of article is estimated within the first half of 2020.

Funding:

Ahus Internal Strategical Research Funding 2020	500 000 NOK
Ahus Internal Strategical Research Funding 2017	100 000 NOK
Ahus Department of Orthopaedic Surgery Publication Funding 2016	15 000 NOK
Ahus Department of Orthopaedic Surgery Publication Funding 2016	4 170 NOK
Total Funding:	619 170 NOK

Treatment results after acute Achilles tendon rupture: A randomized controlled trial comparing conservative treatment with open and minimal invasive surgery.

Ståle Myhrvold, MD, Consultant Orthopedic Surgeon, PhD student, Ahus
 Supervisors: Sigurd Erik Hoelsbrekken, MD, PhD, Akershus University Hospital; Lars Engebretsen, Prof., and Co-supervisor, Oslo University Hospital; Svend Ulstein, MD, PhD, Akershus University Hospital

Research group: Tor-Kristian Andresen, MD, Registrar; Espen Brouwer, MD, Consultant Orthopedic Surgeon, Diakonhjemmet Hospital; Madeleine Amundsen, MD, Oslo University Hospital, Ullevål; Maren Paus, MD, Oslo University Hospital, Ullevål; Charlotte Ferner Heglund, MD, Oslo University Hospital, Ullevål; Faisal Butt, MD, Consultant Orthopedic

Surgeon, Buskerud Hospital, Drammen; Wolfram Grün, MD, Østfold Hospital, Kalnes; Karin Rydevik, MSc, Specialist in Sports Physiotherapy, NIMI; Kjetil Waal, MD, Consultant Orthopedic Surgeon, Co-supervisor, Oslo University Hospital, Ullevål.

Introduction: Achilles tendon rupture can be treated operatively or non-operatively. Since the risk of re-rupture after surgery is thought to be lower than after conservative treatment, surgery is considered to be the best treatment, despite the potential for wound complications and nerve damage. However, new rehabilitation regimes have yielded favorable treatment results after non-operative treatment.

Aim: Since no consensus exists regarding treatment of Achilles tendon ruptures, in this study we aim to investigate whether one type of treatment is superior.

Materials and methods: This randomized controlled trial compares non-operative treatment with open and minimal invasive surgery. The study is a collaboration among four hospitals and involves 530 patients. Testing are performed blindly at NIMI and Ahus. Different methods of measuring the length of the Achilles tendon have been tested and a publication of the reliability of three different methods is published in *Knee Surgery, Sports Traumatology, and Arthroscopy (KSSTA)* in 2017. A validation of the Norwegian versions of the patient-reported outcome measures of ATRS (Achilles Tendon Total Rupture Score) and FAOS (Foot and Ankle Outcome Score) is also published in *KSSTA* in 2017. We will also conduct a treatment–cost analysis in relation to individual results.

Current status: All 530 patients were included by the end of May 2018. All patients are followed for at least 12-months post injury. By the end of December 2019 we have digitalized the collected data from all 530 patients. We have digitalized all PROMS from all controls of responsive patients. What remains is digitalization and systemization of the last half of the physical tests done by the physiotherapists. This will be ready by the end of February 2020 and is conducted by Tor-Kristian Andresen. Statistical Analyses Plan (SAP) will be ready by January 2020 by Morten Valberg at Clinical Trial Unit (CTU). Writing of the main article and the Health economic study will hopefully be conducted in parallel during the first half of 2020. PhD disputation early autumn 2020 at the latest.

Publications: We have in 2017 published both the validation of a method of measuring the length of the Achilles tendon by use of ultrasound (KSST-D-17-00632R3 Ultrasound measurement of Achilles tendon length using skin markings was more reliable than extended-field-of-view imaging) and the Norwegian validation of ATRS (KSST-D-17-00576R2 Validity and reliability of the Norwegian translation of the Achilles tendon Total Rupture Score). The main article will be published in 2020 together with the health economic study, and the PhD thesis will hopefully be finished by mid 2020.

Funding:

Ahus Internal Strategical Research Funding 2020	500 000 NOK
Bye & Hoff’s Fund for Scientific Medical Research, 2014	17 000 NOK
Ahus Internal Strategic Funding 2013	250 000 NOK
PhD Scholarship from Helse Sør-Øst	2 750 000 NOK
Total Funding:	3 517 000 NOK

Spinal injuries

The NORDSTEN-trial, a randomized multicenter study comparing different surgical procedures in patients with spinal stenosis with or without degenerative slip.

Scientific Board:

Christian Hellum MD PhD (Oslo University Hospital), Kjersti Storheim ScD Associate Professor (Oslo University Hospital), FORMI (a Communication and Research Unit in the Division of Neuroscience, Oslo University Hospital), Kari Indrekvam MD Associate Professor (Haukeland University Hospital), Jens Ivar Brox MD Professor (Oslo University Hospital),

Oliver Grundnes MD PhD (Akershus University Hospital), Tore Solberg MD Associate Professor (University Hospital of North Norway), Ivar Magne Austevoll MD PhD student (Haukeland University Hospital), Erland Hermansen MD PhD student (Aalesund Hospital) and Frode Rekeland MD (Haukeland University Hospital).

Administrative Executive Board:

Kari Indrekvam MD Associate Professor (Haukeland University Hospital), Berit Kvalsvik Teige PhD (More and Romsdal Health Trust), Kjersti Storheim Associate Professor (Oslo University Hospital), FORMI, Christian Hellum MD PhD (Oslo University Hospital), Erland Hermansen MD PhD student (Aalesund Hospital) and Ivar M Austevoll MD PhD student (Haukeland University Hospital).

Working Committee/Participating Hospitals:

Leader: Erland Hermansen MD PhD student (Aalesund Hospital).

Members: One surgeon and one study coordinator from each participating hospital.

Participating hospitals (16): Aalesund Hospital, Hagevik Hospital, Haukeland University Hospital, Stavanger University Hospital, Oslo University Hospital, **Akershus University Hospital**, St. Olav University Hospital, University Hospital of North Norway, Levanger Hospital, Lillehammer Hospital, Gjøvik Hospital, Bærum Hospital, Martina Hansen Hospital, Drammen Hospital, Skien Hospital, Arendal Hospital.

The three sub-studies each have a project manager:

SST: Erland Hermansen MD PhD student (Aalesund Hospital).

DST: Ivar Magne Austevoll MD PhD student, (Haukeland University Hospital).

OC: Frode Rekeland MD (Haukeland University Hospital)

Introduction: The trial consists of three different arms:

1. **SST-arm: Lumbar Spinal Stenosis arm**
2. **DST-arm: Lumbar Degenerative Spondylolisthesis arm**
3. **OC-arm: Observational Cohort**

In this trial, we distinguish between Lumbar Spinal Stenosis (LSS) and Lumbar Degenerative Spondylolisthesis (LDS). These two conditions are handled in two separate pathways. We also have an Observational Cohort, consisting of patients that suffer from the LSS radiologically, but do not have sufficient amount of symptoms to justify surgery.

The main issue in the LSS-arm is to find which surgical procedure will give the best short-term and long-term results and to quantify the degree of decompression required to maintain the best results.

In the LDS-arm, the main issue is whether a fusion in addition to a midline-preserving decompression is needed to maintain the best results.

In the Observational Cohort (OC) we want to investigate whether there are characteristics in the symptomatology or radiological findings that can explain why some of the patients have milder clinical symptoms. The number of patients that require surgical treatment at a later stage will be noted.

We have received an approval from the Norwegian Committees for Medical and Health Research Ethics (2011/2034 and 2013/366).

Aim: The main objective of the study is to find which choice of treatment gives the best clinical results evaluated by Patient Reported Outcome Measurements (PROM).

Primary outcome: In the two surgical arms, the primary outcome is a measurement of the change of ODI (version 2.0) after two, five and ten years. In the OC-arm, the primary outcome is time-to-operation or whether the patients require surgical treatment.

Secondary outcomes: In the two surgical arms, the secondary outcomes are changes in EQ-5D, ZQS-score, NRS for LBP, NRS for leg pain, and self-evaluated effect of surgery. All of these PROM-questionnaires have been evaluated in several studies. Differences according to surgical methods will also be registered. Complications, operation time, blood loss and length of stay are all outcomes that will be reported.

In the OC-arm the secondary outcome is to register change in clinical parameters, measured by ODI, EQ-5D, ZQS-score, NRS for LBP and NRS for leg pain.

Materials and Methods: Inclusion and exclusion criteria: Both sexes are eligible for inclusion. Please note that all criteria are the same for all three arms, except the presence of a verified slip in the affected level of 3 mm or more (exclusion for LSS, inclusion for LDS). For the OC-arm, we do not have a distinction between verified slip or not.

Current status: AHUS became a member of the study in January 2015. The inclusion phase is now finished. On a national scale 437 patients are included in the SST study. 146 patients are included in the Unilateral group, 142 in the Bilateral group and 149 in the Osteotomy group. Respectively 264 patients are included in the DST group (104 %) and 256 in the OC group. This makes the present study the largest randomized study ever worldwide. One doctoral student has responsibility for the LSS-arm, and the other has responsibility for the LDS-arm. We anticipate two additional PhD degrees. MD Jørn Åen, Ålesund Hospital is granted a 6 years scholarship (Project no: P-101840-01) based on a 50 % participation with the title: *Radiological findings in patients with spinal stenosis before and after surgery: comparing the impact of three surgical techniques*.

Furthermore, there have been some incentives for the Radiology Department to initiate a radiological project on data from the study and MD Hassan Banitalebi, Radiological Dept AHUS is now working on a PhD protocol.

Project Plan/Timeline: Both the SST-arm and the DST-arm follow almost the same timeline. The inclusion phase ended October 2018. The two-year clinical and radiological follow up is still ongoing.

Publications: There will be numerous publications from the trial that will be sent for publication in reputable international journals. We will also present our research both at national and international spinal congresses. So far 4 articles have been published by the study group.

Funding: Up until now, we have received funding for 7.5 million Norwegian Kroner from the Liaison Committee between the Central Norway Regional Health Authority (RHA) and the Norwegian University of Science and Technology (NTNU). We have two doctoral students involved in the project financed by the Liaison Committee between the Central Norway Regional Health Authority (RHA) and University of Bergen.

Nursing Research

Factors that may impact on the functional level of older patients following hip fracture surgery.

Marit Kirkevold PhD, Sofie Høen, Study nurse at Akershus University Hospital; Linda Andresen, Study nurse at Akershus University Hospital; Torunn Hammer, Study nurse at Akershus University Hospital; Maria Coccozza, Study nurse at Akershus University Hospital; Mia Charlotte Emilsen, Study nurse at Akershus University Hospital and Nina M Weldingh.

Introduction: Numbers from the hip fracture register indicate that one year after the surgery, only about half of the patients who were independent in walking, personal hygiene and activities of daily living have regained the same level of functioning (Hoftebruddregisteret 2012). Reduced functional level and high mortality are related to frailty and comorbidity, but may additionally be associated with complications following the hip fracture. Some of these complications may be prevented or limited by tailored treatment and follow-up (Holvik et al. 2010). The literature review shows that a number of patient-related factors may explain the functional level both before and after a hip fracture in older patients. Several of these may be modified by nursing measures in the days prior to and following surgery. One essential goal for the treatment of patients following hip fracture is improved short-term and long-term functioning. Consequently, it is important to assess if and to which degree these factors are present and impact on the outcome. This knowledge will make it possible to intervene early and target factors that may contribute to the negative development, thereby preventing at least some of the functional decline.

Aim: The main purpose of this project is to contribute with knowledge that may improve the nursing care of patients with hip fracture. Specifically, the purpose is to explore which factors impact on the level of functioning at discharge and after three months post-discharge.

Materials and methods: The study is exploratory and longitudinal. The patients are assessed at admission, every day during hospitalization and after three months. This study plans to utilize parts of the data already being collected for the CSF/delirium study. In addition, we will collect data on nutritional status at admission, daily mobilization status following the surgery, functional level before admission, at discharge and 3 months after discharge. Furthermore, pain and nausea are assessed daily and grip strength is assessed pre- and postoperatively once during hospitalization. In addition, other data assumed to potentially influence level of functioning at discharge and after three months will be collected.

Current status: All 132 patients were included by the end of June 2018. 3 month follow-up is completed and all collected data is digitalized. Research article is expected by June 2020.

Funding: The department of orthopaedics are funding this nurse research project as part of developing the nursing research.

MEDICAL STUDENT PROJECTS

Risk of knee replacement after anterior cruciate ligament injury: a systematic review.



Milan Duong Nguyen, medical student, University of Oslo
Supervisors: Asbjørn Årøen, Professor dr.med., Truls Martin Straume-Næsheim, post.doc.

Introduction: It is recognized that patients suffering rupture of the anterior cruciate ligament (ACL) are prone to accelerated osteoarthritis (OA), thus, this patient group is at increased risk of undergoing knee replacement (KR) at a younger age compared to the general population. There are limited data directly determining the risk of KR in ACL-injured patients. The purpose of this study is to estimate the risk of undergoing KR in patients with a history of primary ACL injury (ACLi).

Aim: There are few existing studies analyzing KR as an outcome in ACL-injured patients. The purpose of this systematic review was to estimate the risk of undergoing KR among patients with a history of primary ACLi with or without subsequent lesions.

Materials and methods: A systematic literature search with keywords and MeSH terms was performed using PubMed and Cochrane Library. All studies reporting KR as an outcome in individuals with primary ACLi was identified. Individuals with concomitant and secondary intra-articular injuries were included. A modified version of the Coleman Methodology Score (CMS) was used to evaluate the quality of the included studies. The risk was estimated by using the total number of ACL-injured patients and the total number of KRs within this cohort, consisting of both patients with reconstruction and patients with non-operative treatment.

Results: A total of 152 390 ACL-injured patients and a total of 1071 KRs were assembled from 5 prospective and 7 retrospective studies, which revealed a mean modified CMS of 70. Mean follow-up time was 16 years (ranging from 4.6 to 30 years). Mean age among the patients was 29.8 years. Estimated risk of undergoing KR after ACLi was 0.7 % with values between 0.54 % and 9.5 % among the included studies.

Current status: Data collection completed. It is desirable with more high-quality, preferably prospective, studies with minimal variability in baseline characteristics and consistency in follow-up times, rehabilitation protocols and diagnostic techniques.

Publications: Planned to be published in BMC.

ACL rupture: The rates at which patients return to sports after surgical reconstruction seem to be worse than anticipated.



Magnus Aanstad, medical student, University of Oslo
Supervisors: Truls M. Straume-Næsheim, post.doc, Asbjørn Årøen,
Professor dr.med.

Introduction: Rupture of the ACL is a serious knee injury. Both mass media and publicly available encyclopaedia scan give the impression that surgery usually fixes the problem and allows the patient to return to their sport or activity at the same level as before injury. But that might not be a realistic portrayal of the severity of the injury.

Aim: The main aim of this study is to determine the rates at which patients who undergo surgical ACL reconstruction return to their sport, and find out whether the portrayal of the severity of this injury by the mass media and encyclopaedias are in fact realistic.

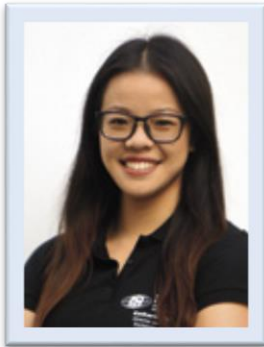
Materials and methods: This meta-analysis is based on literature found in Medline and Cochrane Library about ACL reconstruction and the outcome of whether the patients return to sports. Relevant studies were selected based on defined selection criteria and systematic study quality assessment, with an objective scoring system and a defined score cut-off for inclusion.

Results: Our results show that 72.2 % of ACL deficient patients return to some form of sports after surgical reconstruction, but only 56.5 % return to the same level as before the injury. More importantly, the method which the included studies used to report return to sports data varied greatly between the included studies. In fact, more than half (22 out of 42) of the included studies did not report how return to sports data was measured at all. Therefore, it is uncertain whether our results reflect a meaningful approximation of the rate of return to sports in the population.

Current status: Data collection and analysis has been completed. Article in writing, to be submitted to an international peer-review open access journal.

Publications: The results will be published in an international peer-reviewed open access journal.

Cartilage Damage in the Knees – From biology to treatment



Katherine Wang Medical Student Research Program (University of Oslo)

Supervisors: Rune B. Jakobsen MD PhD, Cathrine N Eftang, MD PhD and Asbjørn Årøen, Professor dr.med.

Introduction: Cartilage has very limited ability to repair itself and a lesion can become progressively degenerative. It is therefore important to identify lesions early in order to treat the symptoms and hopefully prevent or delay degeneration. Current forms of treatment in Norway range from the conservative (physiotherapy) to simpler procedures (debridement and microfracture) to the more complicated (transplantation of cartilage). Studies comparing the treatment forms so far have had varying results and different subpopulations appear to respond differently to various forms of treatment.

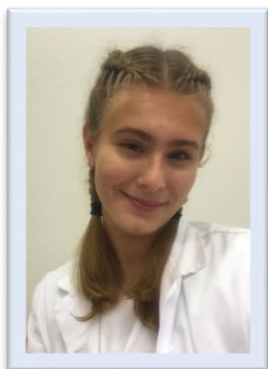
Aim: Main project: To determine any differences in gene expression in the cartilage of three different groups of patients with knee injury or osteoarthritis. **Side project 1:** To compare patient-reported outcome at 10-14 years follow-up after ACL-injury and cartilage damage with earlier follow-up results from 2-5 years (Røtterud et al. 2012) and 5-9 years (Ulstein et al. 2014) after surgery. **Side project 2:** To determine if newly published results (Røtterud et al. 2016) affect surgeon's choice of treatment for ACL-rupture with cartilage damage in Scandinavia.

Materials and methods: Main project: A total of 48 cartilage biopsies will be collected, 16 each from three different groups of patients, (1) patients with osteoarthritis, (2) patients with ACL-injury and a focal cartilage lesion, and (3) patients with ACL-injury without cartilage damage. The biopsies are immediately frozen and then RNA is isolated and sequenced. **Side project 1:** A prospective cohort-study with a matched control group using data from the Norwegian Cruciate Ligament Register (NKLK). Thirty patients registered in NKLK from 2004-2007 are included in the study with two matched controls, isolated ACL-injury, per patient. **Side project 2:** Data from operation forms from the national cruciate ligament registers in Norway, Sweden, and Denmark will be used to compare the choice of treatment the baseline from 2016. Standard methods of trend estimation with regression analysis and statistical process control will be used to analyze the data.

Current status: Main project: Poster presented at ICRS World Congress Vancouver 2019. Manuscript is in preparation for submission in 2020 Q2. **Side projects:** Approval for extension by REC achieved for side project 1, pending final approval by Data Protection Officer. X-rays and data-acquisition is ongoing.

Funding: The project has funding from the Medical Student Research Program at the University of Oslo and South-Eastern Norway Regional Health Authority, from Gythfeldt and frues research fund and from Odd-Fellow Foundation.

Patient-reported outcomes after acute distal biceps tendon ruptures treated surgically and non-surgically at Ahus between 2012 and 2016.



Helene Bakken Rontén, medical student, University of Oslo
Supervisors: Rune B Jakobsen, MD PhD, Erik Jahnsen, MD

Introduction: Ruptures to the distal biceps tendon are comparatively rare with an incidence reported in the literature of 1.2 -5.4 per 100.000. The typical patient is male and between 40 and 60 years of age. Several surgical options for treatment exist but none has been proven to provide superior outcomes. At Akershus University Hospital the two-incision technique with suture anchors has been preferred technique. Approximately 50 patients per year are treated surgically with equals a higher incidence than previously reported. Normally the follow-up-period does not exceed beyond 8 weeks postoperatively. Hence we have limited knowledge about complications and long-term outcome.

Aim: We aim to assess the incidence of all distal biceps tendon ruptures treated surgically and non-surgically during a 5-year period. The project will provide descriptive statistics for types of treatment, demographic data, recorded complications and physician and patient reported outcome. The results will form the basis for possible changes to the present standard of treatment at our institution.

Materials and methods: This study is a retrospective quality control study using the electronic patient record. Patients treated in between 2012 and 2017 will be identified using ICD and NSCP codes (S46.2 and NCL-19, -49 and -99, NBL-19, -49 and -99.) Patients will be contacted and asked to return a patient reported outcome measure questionnaire (Quick-DASH).

Results: No results available.

Current status: All patients have been identified and manually confirmed. Data acquisition from the electronic patient record has been completed. Planning of questionnaire survey among treated patients in progress.

Publications: The results will be presented at Norwegian Orthopaedic Autumn meeting and will be published in an open access orthopedic journal.

Funding: The project has not received any funding.

PUBLICATIONS

Publications (peer-reviewed)

Bartels S, Gjertsen J.E, Frihagen F, Rogmark C, **Utvåg S.E.** *Low bone density and high morbidity in patients between 55 and 70 years with displaced femoral neck fractures: a case-control study of 50 patients vs 150 normal controls.* BMC Musculoskeletal Disorders, 2019 Aug 14;20(1):371.

Clements S, **Hammer O.L**, Benth J.S, **Jakobsen R.B**, **Randsborg P.H.** *Early Mobilization and Physiotherapy Vs. Late Mobilization and Home Exercises After ORIF of Distal Radial Fractures - A Randomized Controlled Trial.* The Journal of Bone & Joint Surgery, 2019 Aug 28;4(3). pii: e0012.1-11.

Dolatowski F.C, Frihagen F, **Bartels S**, Opland V, Benth J.S, Talsnes O, **Hoelsbrekken S.E**, **Utvåg S.E.** *Screw Fixation Versus Hemiarthroplasty for Nondisplaced Femoral Neck Fractures in Elderly Patients: A Multicenter Randomized Controlled Trial.* The Journal of Bone & Joint Surgery, 2019 Jan 16;101(2):136-144.

Hermansen E, Myklebust T.Å, Austevoll I.M, Rekeland F, Solberg T, Storheim K, **Grundnes O**, Aaen J, Brox J.I, Hellum C, Indrekvam K. *Clinical outcome after surgery for lumbar spinal stenosis in patients with insignificant lower extremity pain. A prospective cohort study from the Norwegian registry for spine surgery.* BMC Musculoskeletal Disorders, 2019 Jan 22;20(1):36.

Hammer O.L, **Clements S**, Hast J, Benth J.S, Madsen J.E, **Randsborg P.H.** *Volar Locking Plates Versus Augmented External Fixation of Intra-Articular Distal Radial Fractures - Functional Results from a Randomized Controlled Trial.* The Journal of Bone & Joint Surgery, 2019 Feb 20;101(4):311-321.Orto

Pollmann C.T, **Røtterud J.H**, Gjertsen J.E, Dahl F.A, Lenvik O, **Årøen A.** *Fast track hip fracture care and mortality – an observational study of 2230 patients.* BMC Musculoskeletal Disorders, 2019 May 24;20(1):248.

Randsborg P.H, **Kjennvold S**, **Røtterud J.H.** *Arthroscopic Fixation of Osteochondritis Dissecans of the Knee Using a Motorized Pick and Headless Compression Screws.* Arthroscopy Techniques, 2019 Sep; doi: 10.1016/j.eats.2019.05.031.

Stavem K, Skjaker S.A, Hoel H, Naumann M.G, Sigurdson U, Ghanima W, **Utvåg S.E.** *Risk factors for symptomatic venous thromboembolism following surgery for closed ankle fractures: A case-control study.* The Journal of Foot & Ankle Surgery, 2019 Aug 28. pii: S1268-7731(19)30138-9.

Temmesfeld M.J, **Dolatowski F.C**, Borthne A, **Utvåg S.E**, **Hoelsbrekken S.E.** *Cross-Table Lateral Radiographs Accurately Predict Displacement in Valgus-Impacted Femoral Neck Fractures.* The Journal of Bone & Joint Surgery, 2019 Feb 27;4(1):e0037.

Straume-Næsheim T.M, Randsborg P.H, Mikaelson J.R, Sivertsen E.A, Devitt B, Granan L.P, **Årøen A.** *Recurrent lateral patella dislocation affects knee function as much as ACL deficiency – however patients wait five times longer for treatment.* BMC Musculoskeletal Disorders, 2019 Jul 8;20(1):318.

Utvåg S.E, Naumann M.G, Sigurdson U, Stavem K. *Functional outcome 3–6 years after operative treatment of closed Weber B ankle fractures with or without syndesmotic fixation.* The Journal of Foot & Ankle Surgery, 2019 May 4. pii: S1268-7731(19)30063-3.

Østerås N, Moseng T, van Bodegom-Vos L, Dziedzic K, Mdala I, Natvig B, **Røtterud J.H,** Schjervheim U.B, Vlieland T.V, Andreassen Ø, Hansen J.N, Hagen K.B. *Implementing a structured model for osteoarthritis care in primary healthcare: A stepped-wedge cluster-randomised trial.* PLOS Medicine. 2019 Oct 15;16(10):e1002949.

Aamot H.V, Johnsen B.O, **Skråmm I.** *Rapid diagnostics of orthopedic implant-associated infections using Unyvero ITI implant and tissue infection application is not optimal for Staphylococcus species identification.* BMC Research Notes, 2019 Nov 6;12(1):725.

Commentary

Randsborg PH. *Making Omelets without Breaking Eggs Commentary on an article by Gregory S. Kazarian, AB, et al.: The Impact of Surgeon Volume and Training Status on Implant Alignment in Total Knee Arthroplasty.* Journal of Bone and Joint Surgery. Am. Volume. 2019, Oct 2;101(19):e104.

Randsborg PH. *Unstable Osteochondritis Dissecans in the Mature Knee: Internal Fixation Works, But We Need More Data.* Editorial Commentary. Arthroscopy: The Journal of Arthroscopy and Related Surgery, 2019 Aug;35(8)2523-2524.

Abstracts

The Norwegian Orthopaedic Society's Autumn Meeting, Oslo, Oct 2019.

Alhaug OK, Austevoll I, **Mjønes S, Grundnes O, Dolatowski F.** *En nasjonal registerstudie som sammenlikner klinisk effekt av ALIF og TLIF I nivå L5-S etter 3 og 12 måneder.*

Alhaug OK, Dolatowski F, Solberg T, Lønne G. *Kriterier for mislykket resultat etter kirurgi for spinal stenose: En nasjonal registerstudie.*

Dale H, Høvding P, Lutro O, Langvatn H, Schrama J.C, **Skråmm I,** Wik T.S, Westberg M, Fenstad A.M, Engsæter L.B. *Trend og status presens for revisjoner på grunn av infeksjon i hofteproteseregisteret.*

Ekås GR, Grindem H, Ardern C, Engebretsen L. *Kunnskapen om nye meniskskader etter fremre korsbåndsskade holder ikke mål for å kunne styre klinisk praksis.*

Gundersen M, Ulstein S, Jakobsen RB. *Proksimal hamstringseneruptur – en 44-årig pasient med akutt bilateral skade – forløp og resultater.*

Jahnsen E, Rontén H, Jakobsen RB. *Distale bicepsenerupturer behandlet ved Akershus universitetssykehus 2012-2016.*

Randsborg PH, Tajet J, Negård H, Røtterud JH. *Manipulasjon under anestesi (MUA) for stivhet etter kneprotese.*

Sailer M, Årøen A, Skråmm I, Fenstad AM. *Bruk av lokal antibiotika ved rekonstruksjon av fremre korsbånd i Norge.*

Straume-Næsheim T, Persson A, Årøen A. *Patellainstabilitetsregister – noe å bruke tid og ressurser på?*

Wikerøy AKB, Fuglesang HFS, Hesla E, Ulstein S. *A silver bullet when all goes wrong in patellar fractures in the elderly.*

Wikerøy AKB., Fuglesang HFS., Vigen A. *Bilateral heel pressure ulcers with osteomyelitis treated with revisions and surealis flaps in a 74 year old woman.*

Utvåg SE, Fuglesang HFS. *Helseøkonomi ved fiksasjon av dislokerte midskafthsfrakturer av clavícula; basert på RCT av platefiksasjon vs nagling.*

Utvåg SE, Dolatowski F. *Helseøkonomi ved udisloerte lårhalsbrudd hos pasienter over 70 år. Basert på RCT av skruefiksasjon og hemiprotese.*

PRESENTATIONS

Invited lectures

Oslo Sports Trauma Research Center (OSTRC), Spring seminar at Kleivstua, May 2019.

Ulstein S. presentation of PhD-project *Prognosis and treatment of focal cartilage lesions of the knee joint. Medium to long-term results.*

The Engebretsen symposium, October 2019.

Årøen A. *Cartilage injuries to the knee – The ultimate challenge for the orthopaedic surgeon.*

The Norwegian Orthopaedic Society's Autumn Meeting, Oslo, October 2019.

Alhaug OK. *En nasjonal registerstudie som sammenlikner klinisk effekt av ALIF og TLIF i nivå L5-S etter 3 og 12 måneder. Frie foredrag.*

Alhaug OK. *Kriterier for mislykket resultat etter kirurgi for spinal stenose: En nasjonal registerstudie. Frie foredrag.*

Ekås GR. *Kunnskapen om meniskskader etter fremre korsbåndsskade holder ikke mål for å kunne styre klinisk praksis. Frie foredrag.*

Fuglesang HFS. *Treatment of ankle fractures. Course Moderator.*

Fuglesang HFS. *Traume 3. Course Moderator.*

Gundersen M. *Proksimal hamstringseneruptur – en 44-årig pasient med akutt bilateral skade*

– forløp og resultater. Frie foredrag.

Jahnsen E. *Distale bicepsenerupturer behandlet ved Akershus universitetssykehus 2012-2016.* Frie foredrag.

Khadija K. *Brodie abscess: Ung gutt med knesmerter.* Frie foredrag.

Randsborg PH. *Manipulasjon under anestesi (MUA) for stivhet etter kneprotese.* Frie foredrag.

Sailer M. *Bruk av lokal antibiotika ved rekonstruksjon av fremre korsbånd i Norge.* Frie foredrag.

Straume-Næsheim T. *Protese 1.* Course Moderator

Straume-Næsheim T. *Patellainstabilitetsregister – noe å bruke tid og ressurser på?* Frie foredrag.

Utvåg SE. *Helseøkonomi ved fiksasjon av disloerte midskafthsfrakturer av clavícula; basert på RCT av platefiksasjon vs. nagling.* Frie foredrag.

Utvåg SE. *Helseøkonomi ved udisloerte lårhalsbrudd hos pasienter over 70 år. Basert på RCT av skruerfiksasjon og hemiprotese.* Frie foredrag.

Wikerøy A. *Ankle fractures in the elderly and the diabetic patients. Evidence or treatment?.*

Wikerøy A. *A silver bullet when all goes wrong in patellar fractures in the elderly.* Frie foredrag.

Wikerøy A. *Bilateral heel pressure ulcers with osteomyelitis treated with revisions and Suralis flaps in a 74 year old woman.* Frie foredrag.

Other lectures

Oppdalkurset, February, 2019.

Fuglesang HFS. *Advanced fracture course. Lectures Periimplant fractures and Treatment of clavicle fractures. Acute, chronic, sequelae.*

The Norwegian Orthopaedic Trauma Society, Solstrand, September 2019.

Fuglesang, HFS. *Fractures around the knee. Lectures Defects in bone and skin in the proximal tibia and Patella fractures: new implants and methods.*

Skulderakademiet, Lovisenberg sykehus, November, 2019.

Fuglesang HFS. *Lectures Acute treatment of midshaft clavicle fractures and Sequelae after operative and nonoperative treatment of midshaft clavicle fractures.*

Ulstein S. *Prognosis and treatment of focal cartilage lesions of the knee joint. Medium to long-term results.*

Hospital for Special Surgery, Multidisciplinary Science Meeting, New York, October 2019.

Randsborg PH. *ACL registry Research. Data Collection, compliance and Choice of outcome measures.*

Hospital for Special Surgery, Scientific Meeting, New York, November 2019.

Randsborg PH. *From pediatric fractures to cartilage surgery. Orthopaedic Research at Akershus University Hospital, Norway.*

Arranged seminars/meetings

Orthopaedic Research Group seminar, Akershus University hospital, June 2019.

Dolatowski F. *Klinisk forskning på tvers av sykehus og fagspesialiteter.*

Figenschou IS. *Funksjon etter geriatriske bekkenfrakturer.*

Nordbø JV. *Fysisk aktivitet etter protese i hofteladdet.*

Orthopaedic Symposium, "Treatment and Rehabilitation: challenges with foot and ankle injuries ". Thon Hotell Arena, Lillestrøm. October 2019.

Myhrvold S. *Akillesene/ultralyd.*

Sailer MA. *Plantarfascitt.*

Sailer MA. *LisFranc-fraktur.*

Temmesfeld M. *3D-printing ved komplisert ankelfrakturer.*

Årøen A. *Når operere ankelskader?*

Friday meeting, open for all employees at Akershus Universitetssykehus, 2019.

Aanstad M. *Kommer alle tilbake etter kirurgisk rekonstruksjon av fremre korsbånd?*

Ekås G. *Korsbåndsskader hos barn.*

Poster Presentations

15th International Cartilage Regeneration & Joint Preservation Society (ICRS), Canada, October 5-8, 2019.

Wang K. *Low-input RNA-sequencing in patients with cartilage lesions, osteoarthritis, and healthy cartilage - a reference for tissue engineering.*

ICRC Summit 2019, San Diego, January 17-18, 2019.

Årøen A, Kjennvold S, Brinchmann JE, Randsborg PH, Reinholt FP, Engebretsen L. *Bone marrow derived mesenchymal stem cells in a human clinical trial to repair articular cartilage defects of the knee.*

Academic assignments

Supervising activity

Main supervisor for Jan Rune Mikaelson, Akershus University Hospital, **Røtterud JH.**

Main supervisor for Svend Ulstein, Akershus University Hospital, **Røtterud JH.**

Main supervisor for Jakob V. Nordbø, Akershus University Hospital, **Årøen A.**

Main supervisor for Christian Pollmann, Akershus University Hospital, **Årøen A.**

Main supervisor for Stian Kjennvold, Akershus University Hospital, **Årøen A.**

Main supervisor for Filip C. Dolatowski, Akershus University Hospital, **Utvåg SE.**

Main supervisor for Stefan Bartels, Akershus University Hospital, **Utvåg SE.**

Main supervisor for Hendrik F.S. Fuglesang, Akershus University Hospital, **Utvåg SE.**

Main supervisor for Ingi Thor Hauksson, Akershus University Hospital, **Randsborg PH.**

Main supervisor for Ståle Clementsen, Akershus University Hospital, **Randsborg PH.**

Main supervisor for Annette Wikerøy, Akershus University Hospital, **Randsborg PH.**

Main supervisor for Ola-Lars Hammer, Akershus University Hospital, **Randsborg PH.**

Main supervisor for Max J. Temmesfeld, Akershus University Hospital, **Jakobsen RB.**

Main supervisor for Inni S. Figenschou, Akershus University Hospital, **Adelved A.**

Main supervisor for Magnus Aanstad, Medical Student, University of Oslo, **Årøen A.**
Main supervisor for Milan Duong Nguyen, Medical Student, University of Oslo, **Årøen A.**
Main supervisor for Helene B. Rontén, Medical Student, University of Oslo, **Jakobsen RB.**
Main supervisor for Katherine Wang, Medical Student Research Program, University of Oslo, **Jakobsen RB.**
Co-supervisor for Tommy Frøseth Aae, Kristiansund Hospital, **Randsborg PH.**
Co-supervisor for Stian Kjennvold, Akershus University Hospital, **Randsborg PH.**
Co-supervisor for John Christopher Noone, Akershus University Hospital, **Skråmm I.**
Co-supervisor for Stian Kjennvold, Akershus University Hospital, **Årøen A.**
Co-supervisor for Ingi Thor Hauksson, Akershus University Hospital, **Årøen A.**
Co-supervisor for Ståle Clementsen, Akershus University Hospital, **Årøen A.**
Co-supervisor for Buru Gilbert Moatsh, Oslo University Hospital, **Årøen A.**
Co-supervisor for Ole Kristian Alhaug, Lillehammer Hospital, **Utvåg SE.**
Co-supervisor for Christian Pollmann, Akershus University Hospital, **Straume-Næsheim TM.**
Co-supervisor for Jakob V. Nordbø, Akershus University Hospital, **Straume-Næsheim TM.**
Co-supervisor for Ståle Myhrvold, Akershus University Hospital, **Ulstein S.**
Co-supervisor for Ståle Clementsen, Akershus University Hospital, **Jakobsen RB.**
Co-supervisor for Jan Rune Mikaelson, Akershus University Hospital, **Jakobsen RB.**
Co-supervisor for Annette Wikerøy, Akershus University Hospital, **Jakobsen RB.**

Reviewer

Reviewer for BMJ – British Medical Journal **Ulstein, S.**
Reviewer for BMJ Open – British Medical Journal Open, **Ulstein S.**
Reviewer for BMC Musculoskeletal Disorders, **Pollmann C.**
Reviewer for KSSTA – Knee Surgery, Sports Traumatology Arthroscopy, **Røtterud JH.**
Reviewer for AJSM – American Journal of Sports Medicine, **Røtterud JH.**
Reviewer for OJSM - The Orthopaedic Journal of Sports Medicine, **Røtterud JH.**
Reviewer for KSSTA – Knee Surgery, Sports Traumatology Arthroscopy, **Skråmm I.**
Reviewer for JBJS – Journal of Bone and Joint Surgery, **Årøen A.**
Reviewer for AJSM – American Journal of Sports Medicine, **Årøen A.**
Reviewer for BMC - Musculoskeletal Disorders, **Årøen A.**
Reviewer for Cartilage, **Årøen A.**
Reviewer for KSSTA – Knee Surgery, Sports Traumatology Arthroscopy, **Straume-Næsheim TM.**
Reviewer for BMC Musculoskeletal Disorders, **Straume-Næsheim TM.**
Reviewer for Acta Orthopædica, **Randsborg PH.**
Reviewer for JBJS – Journal of Bone and Joint Surgery, **Randsborg PH.**
Reviewer for KSSTA – Knee Surgery, Sports Traumatology Arthroscopy, **Randsborg PH.**
Reviewer for BMC Musculoskeletal Disorders, **Randsborg PH.**

Editor

Associate Editor for JBJS Open Access (JBJS OA), **Randsborg PH.**
Faglig medarbeider Tidsskriftet, **Randsborg PH.**
Associate Editor for BMC Musculoskeletal Disorders, **Årøen A.**
Editorial Board Member for OJSM - The Orthopaedic Journal of Sports Medicine, **Røtterud JH.**

MEDIA

Svend Ulstein's article *Hvordan går det med de som blir operert for bruskskader i kneet?*, published online at: <https://forskning.no/sykdommer/hvordan-gar-det-med-de-som-blir-operert-for-bruskskader-i-kneet/1351708>

Max Temmesfeld's article *3D-printing i ortopedi i Norge: nå eller aldri*, published in Norsk Ortopedpost, april 2019, nr 1 – årgang 24
https://www.legeforeningen.no/contentassets/6789b530314a46e9b347fb0cf505fdca/4574-nop-170x240_01_2019_ok_v5.pdf