



Annual Report 2009

Research Initiative for Physical Therapy

Forskningsskiftet for Fysioterapi (FiF)

INTRODUCTION

Purpose

The Research Initiative for Physiotherapy (Forskningsskiftet for Fysioterapi, FiF) was established at the University of Southern Denmark (SDU) in 2007. It is the first and only such initiative at university level in Denmark. Situated at the Institute of Sports Science and Clinical Biomechanics within the Faculty of Health Sciences, it provides a unique forum to study and improve Physiotherapy treatment, in collaboration with researchers from Sports Science, Orthopedic Surgery and Chiropractic.

Funding

The Initiative is the result of collaboration between SDU and the Association of Danish Physiotherapists, with additional financial support from the Danish Rheumatism Association. It was initially established as a five-year initiative with funding provided to employ senior and junior researchers. Funding for research projects was not provided; this has been sought through grant applications from external sources.

Performance monitoring

A steering committee comprised of members from each of the funding organisations has been formed to provide advice and to monitor progress against established performance criteria. In addition, Professor Maura Iversen has continued in the role of international advisor to the Research Initiative. Professor Iversen is Professor and Chair, Department of Physical Therapy, Bouve College of Health Sciences, Northeastern University, Boston and an Associate Professor in Medicine at Harvard University, Boston, USA. She visited SDU for the second time in March 2009 and accepted her title as Honorary Professor in the Faculty of Health Sciences in June 2009. During her visit, in conjunction with the faculty, six objectives were established for 2009. These were to:

1. Develop protocols and collect data for newly funded FiF projects
2. Expand engagement of PT students and PhD students in research initiatives
3. Seek external funding for projects
4. Submit papers for publication and presentation
5. Hold the second annual advisory meeting
6. Enhance collaboration with University faculty and Physiotherapy programs to develop clinical /translational research in Physiotherapy.

The content of this Annual Report outlines the success of FiF in achieving all six of these objectives. The full report from Professor Iversen's visit is attached as an appendix.

Summary of the Year's achievements

FiF's improving reputation and profile is evidenced by its success during 2009 in attracting over DKK 3.8 million in external funding for research, its production of 36 peer-reviewed manuscripts published or in press, its expanding network of national and international collaborators and its growth from one person in 2007 to a total of 11 people today. Of these, five students are enrolled in PhD study, two students have submitted PhD-applications, and others are requesting to enrol in the PhD program. With the recent re-structure of the Institute of Sports Science and Clinical Biomechanics, FiF has been elevated to a research unit in its own right, effective from 1 January 2010.

FACULTY

Professor Ewa Roos continued in her role as Head of the Research Initiative building a competent and committed team of researchers and supporters. Staff members recruited in the early stages of the Initiative were:

- Professor Karen Søgaaard PhD, 80 % FTE
- Associate Professor (Lektor) Hans Lund PhD, 50 % FTE
- Secretary Jette Tromborg, 20 % FTE

Professor Roos and Professor Søgaaard, together with their students, actively sought and obtained external funding to advance the research initiatives of the program. Dr Lund served a vital role as the individual responsible for marketing progress of the group, maintaining collaborations and communication among stakeholders to advance the research and educational objectives of FiF.

Three additional people were employed in 2009:

- Associate Professor (Lektor) Birgit Juul-Kristensen PhD (1 March), 100% FTE
- External Associate Professor Robin Christensen PhD (1 July), 20% FTE
- Academic Administrator Suzanne Capell MEd. MTESOL (1 October), 25% FTE

Dr Juul-Kristensen has brought additional expertise in neck and shoulder research to FiF. She has assumed the responsibility of coordinating the meetings and learning exchanges for the PhD students, and delivers education to the programs of the Faculty of Health Sciences. Dr Christensen has provided methodological and statistical support to FiF researchers on an individual basis and through regular seminars. Ms Capell, as a native English speaker, has offered assistance to FiF in the form of editing academic manuscripts, grant applications, letters and reports written in English and providing feedback on oral presentations delivered in English.

PHD STUDENTS

The core faculty expanded with the identification and mentoring of prospective PhD students. Four PhD students were formally accepted into the PhD program in 2009, joining Jonas Bloch Thorlund, who commenced the previous year:

- Carsten Juhl, Physiotherapist, MPH, 1 September
- Camilla Marie Larsen, Physiotherapist, 1 September
- Allan Villadsen, MD, 1 October
- Bibi Gram, Physiotherapist, 1 March

Two students submitted their PhD applications:

- Silje Stensrud, Physiotherapist
- Inge Ris Hansen, Physiotherapist

University duties

Two FiF staff members assisted with the oral examination of two Norwegian PhD students:

- On 28 August 2009, Hans Lund was first opponent at Gro Jamtvedt's oral defense of her PhD entitled, "Physiotherapy in patients with knee osteoarthritis – clinical practice compared to findings from systematic reviews" Gro has been studying at the University of Oslo, Norway.
- On 20 November 2009, Ewa Roos was first opponent at Lars Petter Granan's oral defense of his PhD entitled "Developing a national registry of ACL reconstruction". Lars Petter is an MD who has been studying at the University of Oslo, Norway.

RESEARCH ACTIVITIES

The research staff members have spent the year focussing their attention on the development of protocols and the collection of data for the newly funded FiF projects. In addition, they have been completing projects that were associated with prior research positions.

The research activities within FiF all relate to physical activity, exercise, and muscle function. They are divided into three areas:

1. Prevention and treatment of joint injury and osteoarthritis (Leader: Ewa Roos)
2. Systematic reviews and meta-analyses of the literature (Leader: Hans Lund)
3. Prevention and treatment of neck and shoulder disorders (Leader: Karen Sjøgaard)

1. Prevention and treatment of joint injury and osteoarthritis

Three PhD-students are involved in this area. Their projects relate to the identification of muscle function in meniscectomized patients at high risk of developing knee osteoarthritis, exercise and surgery as treatments for meniscectomized patients, and exercise in patients waiting for hip or knee joint replacement.

PhD research projects

- 1.1 Neuromuscular function in meniscectomised subjects (NeuFUNC): Jonas B Thorlund
- 1.2 Arthroscopic partial meniscectomy or exercise therapy as treatment for degenerative meniscus tears in middle-aged patients (OMEX): Silje Stensrud
- 1.3 Preoperative exercise of patients undergoing total hip or knee replacement – A randomized, controlled trial: Allan Villadsen

Additionally, Ewa Roos contributes her expertise to the fields of osteoarthritis in the young and middle-aged, exercise as treatment for joint injury and osteoarthritis and outcomes methodology through her work with many international task forces and collaborations, resulting in joint publications (see peer-reviewed publications). Nationally, Ewa Roos serves as co-advisor in two PhD-projects related to outcomes methodology.

2. Systematic reviews and meta-analyses of the literature

One PhD-student is directly involved in this area, and his project is related to questions regarding who specifically will benefit from exercise amongst patients with knee osteoarthritis, and the dose-response relationship for exercise in knee osteoarthritis.

PhD research project

- 2.1 Meta-regression analyses of exercise studies including patients with knee osteoarthritis (MEREX): Carsten Juhl

Hans Lund is further involved in the updating and preparation of two Cochrane Reviews (Aquatic exercise for knee and hip osteoarthritis, and Weight reduction for obese knee osteoarthritis patients). Other systematic reviews are prepared in cooperation with Robin Christensen and other international collaborators, concerning the physiotherapy treatment of osteoarthritis. For example, a prospective meta-analysis has been commenced, which will combine the results from three studies at different international sites. The benefit of a prospective meta-analysis is that it is based upon individual patient data instead of summary data at a pooled group level.

3. Prevention and treatment of neck and shoulder disorders

Three PhD-students are working in this area. The first PhD is part of a larger research project, BIONEX, and relates to the reliability of the clinical diagnostic test for myalgic and impingement patients as well as the identification of scapular function in patients at high risk of developing chronic pain. Overall the BIONEX study focuses on the effect of biofeedback-guided physical exercise as treatment. The second PhD project commences in 2010 and is also part of a larger project on chronic neck pain and focuses on the effect of combined physical exercise and behavioural training on whiplash patients. Given the restructure of the Institute, the third PhD will become part of another research unit in 2010.

PhD research projects

- 3.1 Scapular function and selective activation of scapular stabilizing muscles in patients with neck/shoulder pain compared to a group of controls (ScapFunc): Camilla M. Larsen
- 3.2 Physical and cognitive behavioural graded activity as a treatment for patients with chronic neck pain – a randomised controlled study with a one-year follow up: Inge Ris
- 3.3 Effects of work site physical exercise intervention among construction workers with physically heavy work. (FINALE-construct): Bibi Gram.

In addition, Karen Søgaaard contributes her expertise to the domain of work-related musculoskeletal disorders through national and international collaborations, resulting in joint publications (see peer-reviewed publications). She is the main supervisor for one student in FiF and co-advisor for 4 other PhD students in this field of research. Birgit Juul-Kristensen is the main supervisor for the other student in FiF.

A unique attribute of the FiF research team is the focus on dissemination of research to various groups (orthopedics, sport, rheumatology, physiotherapy, biomechanics, exercise physiology). This approach will lead to greater awareness of FiF and enhanced likelihood of collaborative projects.

Research collaborations

International collaborations

FiF has extended its international reach during the year to include:

- The University of Melbourne, Australia: Ewa Roos visited the University in April and, as a result, is the only international clinical investigator in the NHMRC-funded (AUD 700,000) application entitled “Neuromuscular exercise: a novel treatment to reduce symptoms and joint load in medial knee osteoarthritis”. The main applicant is Professor Kim Bennell, Director of the Centre for Health, Exercise and Sports Medicine, School of Physiotherapy, University of Melbourne.
- The Department of Nursing Science and Health, Oslo University: FiF is one of the collaborators in a Norwegian grant application (NOK 32 million) on “Musculoskeletal disorders and physiotherapy in primary health care, connecting knowledge from clinical practice, epidemiology and experimental research”. The main applicant is Professor Nina Vøllestad, University of Oslo.
- The Norwegian Centre for Active Rehabilitation, Oslo University: Ewa Roos and Associate Professor and Chairman of Research, May Arna Risberg assisted a Norwegian student to submit a PhD application. They will co-supervise the PhD student.
- Collaboration with research groups, in addition to those above, in Australia, Belgium, Canada, Holland, Norway, Sweden, Switzerland, UK and the USA has resulted in collaborative publications (see peer-reviewed publications) and joint project proposals:
 - Prince Of Wales Medical Research Centre, Sydney, Australia: Senior Research Fellows, Simon Gandevia, MD and Janet LTaylor.
 - Rehabilitation Sciences and Physiotherapy, University College and University Ghent, Belgium: Associate Professor Ann Cools.
 - Department of Clinical Epidemiology & Biostatistics, McMaster University, Hamilton, Ontario, Canada: Professor Gordon Guyatt,.
 - Roessingh Research and Development, Enschede and the University of Twente, Enschede, The Netherlands: Professor Miriam Vollenbroek Hytten and Professor Hermie Hermens.
 - Institute of Nursing and Health Sciences, Faculty of Medicine, University of Oslo, Oslo, Norway: Professor Kåre Birger Hagan.

- Karolinska Institute, Sweden; Eva Broström PT, PhD, Director of Gait Lab at Astrid Lindgrens Children's Hospital; Mimmi Örtqvist PhD student
- Lund University, Sweden: Stefan Lohmander MD, Professor of Orthopedics; Eva Ageberg Associate Professor of Physical Therapy.
- Umeå University, Sweden: Anne G. Fisher, ScD, OTR, Professor, Division of Occupational Therapy, Department of Community Medicine and Rehabilitation; Eva Wæhrens PhD student.
- University of Zurich: Heike Bischoff-Ferrari MD, Professor at Center for Ageing; Omega Huber PhD-student.
- Academic Rheumatology, Medical & Surgical Sciences, City Hospital Nottingham, UK: Associate Professor Weiya Zhang.
- Massachusetts General Hospital, Boston, USA: Henrik Malchau MD, Associate Professor at Harvard Medical School, Co-director The Harris Orthopaedic Biomechanics and Biomaterials Laboratory; Donna Scarborough PhD student.

National collaborations

FiF further developed existing relationships, and established new relationships, with a variety of Danish research organisations.

Research organisation	Collaborators
SDU (University of Southern Denmark)	Per Aagaard, Jan Hartvigsen, Kirsten Kaya Roessler, Gisela Sjøgaard, Per Kjær
OOUH (Odense University Hospital)	Søren Overgaard, Anders Holsgaard, Aksel Paulsen#
Rygcentret Syddanmark	Claus Manniche, Bente Thomsen
The Parker Institute, Frederiksberg	Henning Bliddal, Bente Danneskiold-Samsøe, Karen Ellegaard, Marius Henriksen and Else Marie Bartels
Rigshospitalet, Copenhagen University Hospital	Lars Remvig, Jens Halkjær Kristensen, Søren Jacobsen
University of Copenhagen	Nicolas C Petersen, Mogens Teisen, Erik B.Simonsen, Tine Alkjær, Peter K. Larsen, Bente R.Jensen, Per Hölmich, Kristian Thorborg*
University of Aalborg	Pascal Madeleine, Afshin Samani ^{&}
University of Aarhus	Kristian Overgaard, Jeanette Christensen ^{&} , Poul Videbech, Lene Nyboe Jacobsen§
NRCWE National Research Centre for the Working Environment	Andreas Holtermann, Lars L. Andersen, Marie Birk Jørgensen ^{&} , Anne Faber Hansen ^{&} .

Ewa Roos serves as co-advisor of PhD student Aksel Paulsen MD (main advisor Søren Overgaard)

* Ewa Roos serves as co-advisor of Kristian Thorborg (main advisor Per Hölmich)

§ Hans Lund serves as co-advisor of potential PhD student (not yet accepted) of Lene Nyboe Jacobsen (main advisor Poul Videbech)

& Karen Søgaard serves as co-advisor of PhD student Afshin Samani (main advisor Pascal Madeleine)

& Karen Søgaard serves as co-advisor of PhD student Marie Birk Jørgensen (main advisor Nicolas Petersen)

& Karen Søgaard serves as co-advisor of PhD student Jeanette R Christensen (main advisor Kristian Overgaard)

& Karen Søgaard serves as co-advisor of PhD student Anne Faber Hansen (main advisor Andreas Holtermann)

Local collaborations

The core staff members engaged undergraduate students from the local university colleges in a number of their research projects to broaden the learning experiences of these students while strengthening the bridge between undergraduate and post-graduate education and to promote the goals of FiF.

Visiting academics

In addition to Professor Maura Iversen, a number of international academics accepted FiF's invitation to visit SDU and participate in presentations, seminars, and mentoring activities:

- Associate Professor Ann Cools, University of Gent, Belgium.
- Senior Research Fellow Janet Taylor, Prince of Wales Medical Research Center, Sydney, Australia.
- Professor Nina Vøllestad, Institute of Nursing and Health Sciences, University of Oslo, Norway.
- Associate Professor Eva Ageberg, Lund University, Sweden.
- Clinician and Clinical Educator Jake Magel, University of Utah, USA.

RESEARCH GRANTS

FiF attracted DKK 3.847.431 in external funding during 2009. These grants are listed below:

1. Gigtforeningen: "Biomechanics and motor control of scapular muscles in patients with neck shoulder pain compared to healthy controls and the effect of physical exercise. A Randomized Controlled Trial design." Main applicant: Karen Søgaard (DKK 441.655).
2. Region Syddanmarks forskningspulje: "Biomechanics and motor control of scapular muscles in patients with neck shoulder pain compared to healthy controls and the effect of physical exercise. A Randomized Controlled Trial design." Main applicant: Karen Søgaard (DKK 1.300.000).
3. Praksisfonden: "Introductory stipend for preparing a protocol for a PhD project for patients with chronic neck pain. ". Main applicant: Inge Ris (DKK 90.000).
4. Praksisfonden: "Physical exercise and cognitive-guided activation in whiplash patients with chronic neck pain - a randomized controlled trial with 1-year follow-up". Main applicant: Inge Ris (DKK 66.000).
5. Jubilæumsfonden: "Scapular function and selective activation of scapular stabilizing muscles in patients with neck/shoulder pain compared to a group of controls" (ScapFunc). Main applicant: Camilla M. Larsen (DKK 52.000).
6. Danske fysioterapeuters forskningsfond: "Physical exercise and cognitive guided activation whiplashpatienter with chronic neck pain - a randomized controlled trial with 1 year follow-up". Main applicant: Inge Ris (DKK 10.000).
7. Helsefonden: "The effect of exercise therapy on pain, function and quality of life in patients with osteoarthritis of the knee: A meta-regression analysis (MEREX)". Main applicant: Carsten Juhl (DKK 350.000).
8. Region Syddanmark forskningspulje: "Preoperative exercise in patients undergoing total hip or knee replacement – A randomized controlled trial". Main applicant: Allan Villadsen (DKK 629.776).
9. Gigtforeningen: "Preoperative exercise in patients undergoing total hip or knee replacement – A randomized controlled trial". Main applicant: Allan Villadsen (DKK 150.000).

10. Protesekompaniet : “Preoperative exercise in patients undergoing total hip or knee replacement – A randomized controlled trial”. Main applicant: Allan Villadsen (DKK 50.000).
11. Trygfonden : “Preoperative exercise in patients undergoing total hip or knee replacement – A randomized controlled trial”. Main applicant: Allan Villadsen (DKK 587.000).
12. Gigtforeningen: ”Neuromuscular Function in Meniscectomized Patients (NeuFunc)”. Main applicant: Jonas Bloch Thorlund (DKK 9.000, travel grant).

Unsuccessful grant applications

A number of grants were unsuccessful, two of which involved large sums of money. The FiF group, however, were greatly encouraged by the feedback received on these applications, and much was learnt from the application process that will prove invaluable for preparing submissions in the future.

- DSF Strategiske Forskningsråd/The Danish Council for Strategic Research: “Individualized Treatment – a key concept in improving the outcome of EXercise as rehabilitation of musculoskeletal disease (ITEX)” (Individualiserede træningsprogrammer – til at forbedre effekt af fysisk aktivitet og specifik rehabilitering) Main applicant: Ewa Roos (Shortlisted for Phase 2. Applied for DKK 22.000.000).
- DSF Strategiske Forskningsråd/ The Danish Council for Strategic Research: “A MUST Multi-disciplinary STrategy for treatment of osteoarthritis impact of patient education, exercise, and manipulation on pain, drug use, function and quality of life in RCTs”. Main applicant: Sören Overgaard, co-applicant Ewa Roos. (Applied for DKK 23.000.000).
- Lundbeckfonden och Novo Nordisk/ Lundbeck Foundation and Novo Nordisk: “Exercise as treatment of hip and knee osteoarthritis - A randomized controlled trial and a pre-specified meta-analysis of three randomized controlled trials of the effect and cost-effectiveness of preoperative exercise on the outcome after total joint replacement”. Main applicant: Ewa Roos (Applied for DKK 2.800.000).

PEER-REVIEWED PUBLICATIONS

The academic staff members have been highly successful in preparing and writing manuscripts for publication. Thirty-four manuscripts were published during the year, with a further two accepted for publication:

Published manuscripts

1. Ackerman IN, Dieppe PA, March LM, **Roos EM**, Nilsdotter AK, Brown GC, Sloan KE, Osborne RH. Variation in age and physical status prior to total knee and hip replacement surgery: A comparison of centers in Australia and Europe. *Arthritis Rheum.* 2009 Jan 29;61(2):166-173.
2. Ageberg E, Roos HP, Thomeé R, Grävare Silbernagel K, **Roos EM**. Knee extension and flexion muscle power after anterior cruciate ligament reconstruction with patellar tendon graft or hamstring tendons graft: A cross-sectional comparison 3 years post surgery. *Knee Surg Sports Traumatol Arthrosc.* 2009 Feb; 17(2):162-9.
3. Ageberg E, Björkman A, Rosén B, Lundborg G, **Roos EM**. Principles of brain plasticity in improving sensorimotor function of the knee and leg in healthy subjects: A double-blind randomized exploratory trial. *BMC Musculoskeletal Disorders* 2009, 10:99.
4. Andersen LL, Andersen JL, Suetta C, Kjær M, **Søgaard K**, Sjøgaard G. Effect of contrasting physical exercise interventions on rapid force capacity of chronically painful muscles. *J Appl Phys* 2009 107(5):1413-9.
5. Danneskiold-Samsøe B, Bartels EM, Bulow PM, **Lund H**, Stockmarr A, Holm CC, Watjen I, Appleyard M, Bliddal H. Isokinetic and isometric muscle strength in a healthy population with special reference to age and gender. *Acta Physiologica* Oct 2009 197: 1-68 Suppl. 673.

6. Davis AM, Perruccio AV, Canizares M, Hawker GA, **Roos EM**, Maillefert JF, Lohmander LS. Comparative, Validity and Responsiveness of the HOOS-PS and KOOS-PS to the WOMAC Physical Function Subscale in Total Joint Replacement for Osteoarthritis. *Osteoarthritis and Cartilage* 2009 17:843-7.
7. Ellegaard K, Torp-Pedersen S, Henriksen M, **Lund H**, Danneskiold-Samsøe B, Bliddal H. Influence of recent exercise and skin temperature on ultrasound Doppler measurements in patients with rheumatoid arthritis - an intervention study. *Rheumatology* Dec 2009 48 (12): 1520-1523.
8. Henriksen M, **Lund H**, **Christensen R**, Jespersen A, Dreyer L, Bennett RM, Danneskiold-Samsøe B, Bliddal H. Relationships Between the Fibromyalgia Impact Questionnaire, Tender Point Count, and Muscle Strength in Female Patients with Fibromyalgia: A Cohort Study. *Arthritis and Rheumatism-Arthritis Care & Research* Jun 15 2009 61(6): 732-739.
9. Holtermann A, Mortensen OS, Burr H, **Søgaard K**, Gyntelberg F, Suadicani P. The interplay between physical activity at work and during leisure time - risk of ischemic heart disease and all-cause mortality in middle-aged Caucasian men. *Scand J Work Environ Health* 2009 35(6):466–474.
10. Holtermann A, Blangsted AK, Christensen H, Hansen K, **Søgaard K**. What characterizes cleaners sustaining a good musculoskeletal health after years with physically heavy work? *Int Arch Occup Environ Health* 2009 Aug;82(8):1015-22.
11. **Juul-Kristensen B**, Kristensen JH, Frausing B, Jensen DV, Rogind H, Remvig L. Motor Competence and Physical Activity in 8-Year-Old School Children With Generalized Joint Hypermobility. *Pediatrics* 2009 Nov;124(5): 1380-1387.
12. Kristiansen J, Mathiesen L, Nielsen PK, Hansen AM, Shibuya H, Petersen HM, Lund SP, Skotte J, Jørgensen MB, **Søgaard K**. Stress reactions to cognitively demanding tasks and open-plan office noise. *Int Arch Occup Environ Health* 2009 Apr;82(5):631-41.
13. Larsen MK, Samani A, Madeleine P, Olsen HB, **Søgaard K**, Holtermann A. Short-term effects of implemented high intensity shoulder elevation and rest during computer work. *BMC Musculoskelet Disord* 2009 Aug;10:101.
14. Larsman P, Thorn S, Sandsjö L, **Søgaard K**, Sjøgaard G, Kadefors R. Work-related perceived stress and muscle activity during standardized computer work among female computer users. *WORK: A Journal of Prevention, Assessment & Rehabilitation* 2009 32(2):189-99.
15. Nilsdotter A-K, Toksvig-Larsen S, **Roos EM**. A 5-year prospective study of patient relevant outcomes after total knee replacement. *Osteoarthritis and Cartilage* 2009 May; 17(5):601-606.
16. Nilsdotter A-K, Toksvig-Larsen S, **Roos EM**. Knee arthroplasty: are patients' expectations fulfilled? A prospective study of pain and function in 102 patients with 5-year follow-up. *Acta Orthop* 2009;1:55-61.
17. Ornetti P, Perruccio AV, **Roos EM**, Lohmander LS, Davis AM, Maillefert JF. Psychometric properties of the French translation of the reduced KOOS and HOOS (KOOS-PS and HOOS-PS). *Osteoarthritis and Cartilage* 2009 17:1604-8.
18. Remvig L, Duhn PH, Ullman S, Kobayasi T, Hansen B, **Juul-Kristensen B**, Jurvelin JS, Arokoski J. Skin extensibility and consistency in patients with Ehlers-Danlos syndrome and benign joint hypermobility syndrome. *Scandinavian Journal Of Rheumatology* 2009 Vol 38, (3): 227-230.
19. Samani A, Holtermann A, **Søgaard K**, Madeleine P. Active pauses induce more variable electromyographic pattern of the trapezius muscle activity during computer work. *J Electromyogr Kinesiol* 2009 19(6): e430–e437.

20. Samani A, Holtermann A, **Søgaard K**, Madeleine P. Effects of eccentric exercise on trapezius electromyography during computer work with active and passive pauses. *Clin Biomech (Bristol, Avon)* 2009 Oct;24(8):619-25.
21. Samani A, Holtermann A, **Søgaard K**, Madeleine P. Experimental pain leads to reorganisation of trapezius electromyography during computer work. *Eur J Appl Physiol* 2009 Aug;106(6):857-66.
22. Taylor JL, Olsen HB, Sjøgaard G, and **Søgaard K**. Voluntary activation of trapezius during unilateral and bilateral voluntary contraction. *J Electromyogr Kinesiol* 2009 19: 584–590.
23. **Thorlund JB**, Aagaard P, Madsen K. Rapid Muscle Force Capacity Changes after Soccer Match Play. *International Journal of Sports Medicine* 2009 30: 273-278.
24. Thorstensson CA, Lohmander LS, Frobell RB, **Roos EM**, Gooberman Hill R. Choosing surgery: patients' preferences within a trial of treatments for anterior cruciate ligament injury. A qualitative study. *BMC Musculoskeletal Disorders* 2009 10:100.
25. Trans T, Aaboe J, Henriksen M, **Christensen R**, Bliddal H, **Lund H**. Effect of whole body vibration exercise on muscle strength and proprioception in females with knee osteoarthritis. *The Knee* 2009 Aug; 16(4): 256-261.
26. W-Dahl A, Toksvig-Larsen S, **Roos EM**. Association between knee alignment and knee pain in patients surgically treated for medial knee osteoarthritis by high tibial osteotomy. A one year follow-up study. *BMC Musculoskeletal Disorders* 2009 10:154.
27. Wikström I, Arvidsson B, Nilsson K, **Roos EM**, Jacobsson LT. Reliability, validity and responsiveness of a new leisure index: the Patient-Specific Leisure Scale (PSLS). *Musculoskeletal Care*. 2009 Sep;7(3):178-93. PubMed PMID: 19191254.

E-pub ahead of print

28. Bartels EM, Bliddal H, Schøndorff PK, Altman RD, Zhang W, **Christensen R**. Symptomatic efficacy and safety of diacerein in the treatment of osteoarthritis: a meta-analysis of randomized placebo-controlled trials. *Osteoarthritis and Cartilage* 2009 Oct 14.
29. Hansen ÅM, Blangsted AK, Hansen EA, **Søgaard K**, Sjøgaard G. Physical activity, job demand-control, perceived stress-energy, and salivary cortisol in white-collar workers. *Int Arch Occup Env Health* 2009.
30. Holtermann A, Mork PJ, Andersen LL, Olsen HB, **Søgaard K**. The use of EMG biofeedback for learning of selective activation of intramuscular parts within the serratus anterior muscle. A novel approach for rehabilitation of scapular muscle imbalance. *J Electromyogr Kinesiol* 2009.
31. Holtermann A, Hansen JV, Burr H, **Søgaard K**. Prognostic factors for long term sickness absence among employees with neck-shoulder and low-back pain. *Scand J Work Environ* 2009.
32. Sell L, Bültmann U, Rugulies R, Villadsen E, Faber A, **Søgaard K**. Predicting long-term sickness absence and early retirement pension from self-reported Work Ability. *International Archives of Occupational and Environmental Health* 2009.
33. Sjøgaard G, Rosendal L, Kristiansen J, Blangsted AK, Skotte J, Larsson B, Gerdle B, Saltin B, **Søgaard K**. Muscle loading and metabolic responses differ between workers with and without trapezius myalgia during stress and repetitive work tasks: microdialysis and NIRS based data. *EJAP* 2009.
34. Thorborg K, **Roos EM**, Bartels EM, Petersen J, Hölmich P. Validity, Reliability And Responsiveness Of Patient-Reported Outcome Questionnaires When Assessing Hip And Groin Disability: A Systematic Review. *Br J Sports Med* 2009 Aug 6. PubMed PMID: 19666629.

Accepted for publication

35. Ageberg E, Herbertsson P, Forssblad M, **Roos EM**. Sex Differences in Patient-Reported Outcomes after ACL Reconstruction – Data from the Swedish Knee Ligament Register. *Am J Sports Med* 2009. (Accepted December 2009).
36. Nielsen PK, Andersen LL, Olsen HB, Sjøgaard G, **Søgaard K**. Effect of Physical Training on Pain Sensitivity and Trapezius Muscle Morphology. *Muscle and Nerve*. (Accepted November 2009).

Published reviews

Roos EM and Lohmander LS. Young patients – old knees: Knee pain in middle-aged is often osteoarthritis [In Swedish: Unga patienter – gamla knän: knäbesvär i medelåldern är ofta artros]. *Läkartidningen* 2009 106(24-25):1645-1648.

Roos EM. Ten years with the Knee injury and Osteoarthritis Outcome Score (KOOS) [In Swedish: Tio år med KOOS och data från 10 000-tals patienter]. *Svensk Idrottsmedicin* 2009 3:8-12.

Publication impact factor

Ewa Roos' papers have been cited over 1400 times with 22 papers cited more than 20 times. She has an H index of 21 (ISI Web of Science January 2010) placing her among the top physiotherapy researchers based on this parameter.

Karen Søgaard's papers have been cited over 950 times with 25 papers cited more than 15 times. She has an H factor of 19 (ISI Web of Science December 2009).

Books, book chapters, letters to the editor

Ageberg E, Thomeé R, Silbernagel KG, **Roos EM**. Reply. *Arthritis Rheum*. 2009 May 28;61(6):854. [Epub ahead of print] No abstract available.

Lund H, Test and measurement issues [editorial], *Advances in Physiotherapy*, 2009; 11(2):49-50

Roos EM. Osteoarthritis [In Swedish: Artros]. *Ordination:Motion –vägen till bättre hälsa*. Editors: Karlsson, Jansson, Ståhle. Brombergs Förlag, 2009

Roos EM, Davis A, Beynon BD. IKDC or KOOS? Which measures, symptoms and disabilities are most relevant to patients? *Am J Sports Med*. 2009 May;37(5):1042-3; author reply 1043.

Roos EM and Lohmander LS. Young patients-old knees [Unga patienter-gamla knän]. Reply [in Swedish]. *Läkartidningen* 2009.

Sell L, Hansen AF, **Søgaard K**. Impacts from Occupational Risk Factors on Self-Reported Reduced Work Ability among Danish Wage Earners. In Kumashiro M.(ed.) "Promotion Of Work Ability Towards Productive Aging." Taylor & Francis Ltd (United Kingdom), 2009.

Lund H, Bartels EM. Massagens fysiologiske virkninger. In: "Lærebog i massage". Linde N, Borg J (eds), Munksgaard Danmark, Copenhagen 2009.

CONFERENCE PRESENTATIONS

The academic staff members have presented their research at conferences and seminars both within Denmark and around the world.

Invited lectures

International

Christensen R. 14th Cochrane Colloquium, Singapore, October, 2009. *Overview of Reviews in the Cochrane Collaboration: Experience from CMSG Reviewing Biologics for Rheumatoid Arthritis.*

Juul-Kristensen B. 3rd Nordic Hypermobility Research Meeting, Rigshospitalet, Copenhagen, June 2009. *Motor competence in children with general hypermobility compared to non-hypermobile children – a cross-sectional study.*

Lund H. Nordic Physiotherapy Congress. Oslo, Norway. September 2009. *Challenges for the physiotherapy profession in extending the scope of physiotherapy.*

Lund H. Annual European Congress of Rheumatology EULAR. Copenhagen, Denmark. June 2009. *The dose-response relationship in exercise therapy for knee osteoarthritis.*

Roos EM. SNOW III. Post-traumatic arthritis of the knee as a model for the study of osteoarthritis. Chicago USA, October 2009. *Patient-reported outcomes and determinants of outcome.*

Roos EM. Spring Seminar at Norwegian School of Sport Sciences, Department of Sports Medicine and Oslo Sports Trauma Research Center. Oslo, Norway. May 2009. *Outcome measures in knee injury and knee OA.*

Søgaard K. Annual Conference for Norwegian Occupational Physiotherapy. Hamar, Norway. March 2009 (Keynote). *Intelligent physical activity – physical activity as prevention of musculoskeletal disorders.*

Søgaard K. Annual Conference for Norwegian Occupational Physiotherapy. Hamar, Norway. March 2009 (Keynote). *Musculo- skeletal disorders, how big is the problem?*

National

Lund H. Danish Physiotherapy Associations Fagfestival. Odense, Denmark. March 2009. *Rehabilitation concept and physiotherapy.*

Lund H. Parkinson's Society Day. Århus, Denmark. April 2009. *Physical activity and training.*

Lund H. Second National Conference on Rehabilitation. Nyborg, Denmark. November 2009. *Rehabilitation, physical education and activity, from a research perspective to thinking in rehabilitation.*

Roos EM. Danish Society of Sports Medicine. Odense, Denmark. January 2009. *Sports and OA.*

Roos EM. Danish Physiotherapy Associations Fagfestival. Odense, Denmark. March 2009 (Keynote). *Vision for research in physiotherapy in Denmark.*

Roos EM. Parker Institute 10-year celebration. Copenhagen, Denmark. October 2009. *Physical therapy and exercise in knee OA.*

Søgaard K. Danish Physiotherapy Associations Fagfestival. Odense, Denmark. March 2009. *A pain in the neck – how to understand, prevent, and treat?*

Søgaard K. The workplace as arena for prevention of reduced work ability. Copenhagen, Denmark. November 2009. *Work ability and Ageing, Niva Nordic Tour 2009*

Other national presentations by FiF members

Juhl C. FTF Conference on Professional Education and the Knowledge Base. Copenhagen, November 2009. *“Research development and quality assurance”.*

Søgaard K. Inaugural seminar on Pain in the Neck – from Research to Clinical Practice. Southern Denmark University, Odense, Denmark. March 2009. “*A pain in the neck – how to understand, prevent, and treat?*”

Søgaard K. Danish Association of Rheumatism, Frederiksberg Rådhus, Copenhagen. October 2009. “*What do we know about neck pain?*”

Søgaard K, Juul-Kristensen B, Larsen CM. Nordic Symposium. Odense, Denmark. October 2009. “*Biomechanics and motor control of scapular muscles in patients with neck/shoulder pain compared to healthy controls and the effect of biofeedback-guided exercise*”.

Søgaard K. Seminar at The Back Centre Southern Denmark, Research Department. Tøystrup Gods 23 November 2009. “*Strategic, research-based development in FiF - Where are we going?*”

Abstracts presented at conferences

International

Roos EM, W-Dahl A, Toksvig-Larsen S, Lohmander S. *High tibial osteotomy and total knee replacement –similar outcome from the patient’s perspective.* The 55th Annual Meeting of the Orthopaedic Research Society. Las Vegas, USA. February 2009.

Blazevich AJ, Miller S, Waugh C, Fath F, Kay T, **Thorlund JB**, Aagaard P. *Influence of plantarflexor stretch training on fascicle length and strain, H-reflex amplitude and muscle force production.* 14th Annual Congress of the European College of Sports Science: Book of Abstracts. Oslo, Norway. June 2009. s.339

Thorlund JB, Aagaard P, Roos EM. *Functional performance and self-reported knee function in meniscectomized patients 2 years after surgery compared to age- and gender-matched controls.* 14th Annual Congress of the European College of Sports Science : Book of Abstracts. Oslo, Norway. June 2009: European College of Sports Science, 2009. s. 266

Samani A, Holtermann A, **Søgaard K** and Madeleine P. *Muscle pain reduces the potential beneficial effect of active pauses during computer work.* ISB. Cape Town, South Africa. July 2009.

Søgaard K., Larsen MK., Samani A., Madeleine P., Olsen H.B. Holtermann A. *Short-term effects of high intensity shoulder elevation during computer work.* ISB. Cape Town, South Africa. July 2009

Holtermann A, Mortensen OS, Burr H, **Søgaard K**, Gyntelberg F, Suadicani P. *Does leisure time physical activity increase the risk of ischemic heart disease mortality among men with high physical work demands? A 30-year follow-up in The Copenhagen Male Study.* 5th International Conference on Work Environment and Cardiovascular Diseases. Krakow, Poland. September 2009.

Holtermann A, Mortensen OS, Burr H, **Søgaard K**, Gyntelberg F, Suadicani P. *Does high physical fitness protect workers with high physical demands from cardiovascular mortality? A 30 year follow-up in The Copenhagen Male Study.* 5th International Conference on Work Environment and Cardiovascular Diseases. Krakow, Poland. September 2009.

Juul-Kristensen, B, Halkjær Kristensen, J, Frausing, B, Frausing, B, Vendelboe Jensen, D, Røgind, H, Remvig, L. *Prevalence of Generalised Joint Hypermobility, and Level of Gross Motor Competence and Physical Activity among Danish School Children at 9 Years Old.* Osteoarthritis Research Society International Congress, (OARSI), Montreal, Canada. September 2009, p S193

H Lund, R Christensen, C Juhl, B Andersen, W Zhang, EM Roos. *Exercise in knee OA - opening the black box: An exploratory meta-analysis.* OARSI. Montreal, Canada. September 2009

Søgaard K, Juul-Kristensen B, Sjøgaard G, Hannetz H, Burr H. *Prevalence and prediction of recurrent musculoskeletal symptoms during a ten-year period and the significance of physical activity at work.* OARSI. Montreal, Canada. September 2009.

Thorlund JB, Aagaard P, **Roos EM**. *Pain, function and muscle strength in meniscectomized patients at high risk of OA compared to age- and gender-matched controls*. 2009 World Congress on Osteoarthritis. Montreal, Canada. September 2009. Osteoarthritis and Cartilage. September 2009. Supplement 1 p.22-23

Remvig, L, Duhn, PH, Ullman, S, Arokoski, J, Jurvelin, J, Safi, A, Jensen, F, Farholt, S, Hove, H, **Juul-Kristensen, B**. *Skin signs in Ehlers-Danlos Syndrome; clinical tests and para-clinical methods*. American Congress of Rheumatology. Philadelphia, USA. October, 2009.

National

Duval A, Ornetti P, Gossec L, Tavernier C, **Roos EM**, Guillemin F, Maillefert JF. *Evaluation of the responsiveness of the Rheumatoid Arthritis Outcome Score (RAOS)*. Annual European Congress of Rheumatology EULAR. Copenhagen, Denmark. June 2009.

Hansen H, **Juul-Kristensen B**. *Isokinetic strength in children with general hypermobility compared to non-hypermobility children – a cross-sectional study*. 3rd Nordic Hypermobility Research Meeting, Rigshospitalet, Copenhagen 2009.

Juul-Kristensen B, Remvig L. *The reproducibility of clinical tests, why is it important? And how can it be tested? (Examples of tests with good and poor reproducibility, Based on tests of hypermobility and scapular dysfunction)*. Danish Physiotherapy Association's Fagfestival, Odense, Denmark, March, 2009

Juul-Kristensen B, Halkjær Kristensen J, Frausing B, Frausing B, Vendelboe Jensen D, Røgind H, Remvig L. *“Prevalence of Generalized Joint Hypermobility and hypermobility syndrome among Danish schoolchildren aged 8, and children's motor and physical activity level”*. Danish Physiotherapy Association's Fagfestival. Odense, Denmark. March, 2009

Nikolajsen H, **Juul-Kristensen B**. *Movement patterns during gait in children with general hypermobility compared to non-hypermobility children – a cross-sectional study*. 3rd Nordic Hypermobility Research Meeting, Rigshospitalet, Copenhagen, June 2009.

Remvig L, **Juul-Kristensen B**. *Skin extensibility and skin consistency measured by Suction Cup respectively Soft Tissue Stiffness Meter, study II*. 3rd Nordic Hypermobility Research Meeting, Rigshospitalet, Copenhagen, June 2009.

Thorlund JB, Christensen PA, Jacobsen O, Madsen T, Suetta C, Aagaard P. *Impaired muscle mechanical performance in special forces soldiers in response to immobilization during SSR mission*. Sports Medicine Congress, Odense, Denmark. January 2009.

Thorup AS, Jensen BR, **Juul-Kristensen B**. *Muscle activity in children with general hypermobility compared to non-hypermobility children – a cross-sectional study*. 3rd Nordic Hypermobility Research Meeting, Rigshospitalet, Copenhagen, June 2009.

Awards

Thorlund JB. Winner of the poster contest at the Annual Danish Congress on Sports Medicine 2009.

INITIATIVES TO ENHANCE AND DISSEMINATE PHYSIOTHERAPY RESEARCH IN DENMARK

Seminars and courses

- FiF seminar January 2009. Second network meeting for Danish Physiotherapists with a PhD and PhD students within physiotherapy research. Presentation on FIF for students at University College Lillebælt 17 March 2009.
- Participant in the preparation of Danske Fysioterapeuter Fagfestival 26-28 March 2009.
- Participant in the preparation of The 7th Nordic Physiotherapy Congress 23-25 September 2009.

- Stakeholders seminar ‘Research in Physiotherapy’ 28 September 2009.
- Evidence-based Practice course, Hjørring Sygehus, February/March 2009.
- Basic statistics for users, Rigshospitalet, April/May 2009.
- Introduction to critical appraisal of diagnostic tests, SDU, April 2009.
- Rehabilitation of the elderly and fall prevention from Theory to Practice v. Shumway-Cook and Woollacott, SDU, October 2009 (in cooperation with Danske Fysioterapeuter).
- Evidence-based Practice course, Aalborg Sygehus, October/November 2009.

Collaboration with physiotherapy educators in Denmark

- FiF was represented in the “Uddannelsesudvalg” in UC Vest, UC Lillebælt and UC Sjælland by Hans Lund
- Approximately 20 Physiotherapy students from the University College Lillebælt have undertaken their Bachelor projects under the supervision of FiF staff, and some have worked as student assistants in ongoing FiF research projects.
- Two students from the Master in Fitness and Training have been under the supervision of FiF staff to complete a Master’s and a Bachelor’s project, respectively.

RAISING THE FIF PROFILE

The research staff members have played an active role in their respective professions, both within the academic environment and the broader health sector, and in doing so, have helped to raise the profile of FiF.

Ewa Roos

- has been appointed an expert by the Swedish National Board for Welfare 2007-2010 to establish guidelines for the treatment of musculoskeletal disorders (osteoarthritis).
- is a member of the Scientific Board for the Association of Danish Physiotherapists.
- is a member of the Scientific Board for the Danish Rheumatism Association.
- is Associate Editor of the journal Osteoarthritis and Cartilage.

Karen Søgaard

- is a member of the Editorial Board of the Journal of Electromyography and Kinesiology and of the International Journal of Industrial Ergonomics.
- is a Council member of The Danish Society of Biomechanics.
- is a member of the Steering Committee in the project “Clinical quality database in physiotherapy practice” for the Association of Danish Physiotherapists.
- has served as member of the ad hoc committee to define criteria for the project “Establishment of development clinics in physiotherapy practice” for the Association of Danish Physiotherapists.
- is a consultant to Munksgaard Denmark to provide advice on the publication of textbooks for physiotherapists.

Hans Lund

- has been appointed an expert by the Swedish National Board for Welfare 2007-2010 to establish guidelines for the treatment of musculoskeletal disorders (osteoarthritis).
- is a member of the Editorial Board for Advances in Physiotherapy.
- is a grant panel member for the Association of Danish Physiotherapists.
- is a consultant to Munksgaard Denmark to provide advice on the publication of textbooks for physiotherapists.

Birgit Juul-Kristensen

- is a member of the Editorial Board for the journal International Musculoskeletal Medicine.

Robin Christiansen

- is statistical editor in the Cochrane Musculoskeletal Group, and the Cochrane Public Health Group.
 - is a member of the Editorial Board for Arthritis Care & Research.
 - is a statistician in the OMERACT initiative; part of the steering group "Defining flare in rheumatoid arthritis": an OMERACT initiative.
 - is a statistical member of the GRADE Working Group.
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