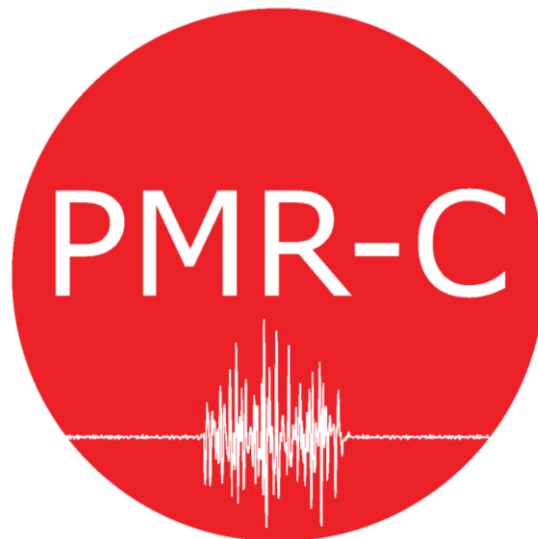


# Annual report 2019

## Physical Medicine & Rehabilitation Research – Copenhagen (PMR-C)

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## 1. ABOUT

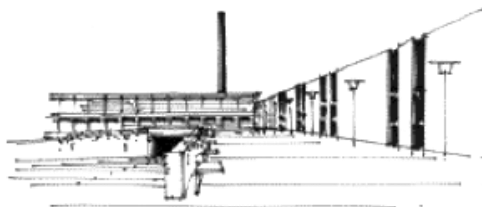
Physical Medicine & Rehabilitation Research – Copenhagen (PMR-C) is a multidisciplinary research program in physical medicine and rehabilitation, based in Copenhagen, Denmark. PMR-C is the research division of the Department of Physical- and Occupational Therapy at Copenhagen University Hospital, Amager and Hvidovre, Denmark. The core of PMR-C is an extensive collaboration between three departments at the hospital: Department of Physical- and Occupational Therapy, Department of Orthopaedic Surgery, and Department of Clinical Research. The hospital is well known for a broad clinical research within enhanced recovery after surgery, and the research focus of PMR-C is inspired by this research tradition.

**The main research focus of PMR-C is the use of physical medicine to enhance the recovery in patients and to prevent injury or disease. Our approach is clinical, but we also conduct basic research to investigate mechanisms and research to develop new outcome measures.**

PMR-C was initiated by Professor Thomas Bandholm, Associate Professor Morten Tange Kristensen and Professor Kristian Thorborg, and was formally established in 2013 in collaboration with Jette Christensen, Head of the Department of Physical- and Occupational Therapy, Peter Gebuhr, Head of the Department of Orthopaedic Surgery, and Ove Andersen, Head of the Department of Clinical Research, Copenhagen University Hospital, Amager and Hvidovre, Denmark. These six people form the PMR-C steering committee. Finally, four highly esteemed researchers form an advisory board that advises the steering committee in the management of PMR-C.

## 2. MAIN ACHIEVEMENTS IN 2019

In 2019, Associate Professor Kristian Thorborg was appointed Professor of Orthopaedic and Sports Physiotherapy and President of the International Federation of Sports Physical Therapy (IFSPT). Senior Researcher Mette Merete Pedersen as well as Senior Researcher Morten Tange Kristensen were appointed Associate Professors – both at the Department of Clinical Medicine, University of Copenhagen.



### 3. PEOPLE

Curriculum and list of publications of PMR-C people can be found at <https://www.hvidovrehospital.dk/pmr-c/about>

#### **PMR-C steering committee**

**Thomas Bandholm:** Dr. Bandholm is a senior researcher and head of research at PMR-C. He is a Professor of Clinical Exercise Physiology and Rehabilitation at the Department of Clinical Medicine, University of Copenhagen. He is responsible for research in enhanced recovery programs following total hip and knee arthroplasties and acute hospitalization for medical illnesses in older patients at PMR-C. Dr. Bandholm has published more than 100 international peer-reviewed papers since 2006.

**Morten Tange Kristensen:** Dr. Kristensen is a senior researcher at PMR-C and Associate Professor at the Department of Clinical Medicine, University of Copenhagen. He is responsible for research in enhanced recovery programs in patients with hip fracture and lower limb amputations at PMR-C. Dr. Kristensen has published more than 70 international peer-reviewed papers since 2005.

**Kristian Thorborg:** Dr. Thorborg is a senior researcher at PMR-C and Professor at the Department of Clinical Medicine, University of Copenhagen. He is responsible for sports medicine research at PMR-C. Dr. Thorborg has published more than 160 international peer-reviewed papers since 2004.

**Jette Christensen:** Ms. Christensen is head of the Department of Physical- and Occupational Therapy, Copenhagen University Hospital, Amager and Hvidovre.

**Thue Ørsnes:** Dr. Ørsnes is head of the Department of Orthopaedic Surgery, Copenhagen University Hospital, Amager and Hvidovre.

**Ove Andersen:** Professor Andersen is head of the Department of Clinical Research, Copenhagen University Hospital, Amager and Hvidovre and research director at Copenhagen University Hospital, Amager and Hvidovre.

#### **Senior researchers**

**Mette Merete Pedersen:** Dr Pedersen is a senior researcher at PMR-C and an Associate Professor at the Department of Clinical Medicine, University of Copenhagen. She is responsible for research on how to optimize treatment and care for older patients with medical illness with a focus on physical activity and exercise.

## **PhD-students supervised by people from PMR-C**

**Helle Gybel Juul-Larsen:** Ms. Juul-Larsen is a PhD-student at the University of Copenhagen. Her PhD deals with multimorbidity-grouping based on disease patterns to optimize disease management programs for older patients with several chronic diseases (Thomas Bandholm, co-supervisor).

**Martin Wollin:** Mr. Wollin was a PhD-student at La Trobe University, Melbourne, Victoria, Australia. His PhD dealt with athlete monitoring - including hamstring and hip strength profiles, injury and training load in elite youth football (Kristian Thorborg, co-supervisor).

**Rasmus Skov Husted:** Mr. Husted is a PhD-student at the University of Copenhagen. His project deals with coordinated non-surgical and surgical care of patients with severe knee osteoarthritis (Thomas Bandholm, main supervisor).

**Tobias Wörner:** Mr. Wörner is a PhD-student at Lund University. His PhD deals with current rehabilitation practice in Scandinavia and outcomes after hip arthroscopy (Kristian Thorborg, co-supervisor).

**Neil Light:** Mr. Light is a PhD-student at Chichester University, England. His PhD deals with groin injury in English elite youth football (Kristian Thorborg, co-supervisor).

**Filip Gertz Lysdal:** Mr. Lysdal is a PhD-student at Aalborg University. His PhD deals with prevention of ankle sprains (Kristian Thorborg, co-supervisor).

**Erneste Esteve:** Mr. Esteve is a PhD-student at Girona University, Spain. His PhD deals with groin injury in Spanish male footballers: Incidence, prevalence, risk factors and prevention (Kristian Thorborg, main supervisor).

**Jordi Vicens:** Mr. Vicens is a part-time PhD-student at Girona University, Spain. His PhD deals with eccentric biased training for physiological adaptation, performance and injury prevention (Kristian Thorborg, co-supervisor).

**Signe Hulsbæk:** Ms. Hulsbæk is a PhD-student at the University of Copenhagen. Her PhD deals with early cross-continuum rehabilitation following hip fracture surgery and the use of muscle building medicine in rehabilitation (Morten Tange Kristensen, main supervisor).

**Maria Swennergren Hansen:** Mrs. Swennergren Hansen is a PhD-student at the University of Copenhagen. Her PhD deals with elongation of the Achilles tendon the first year after rupture and is focused on optimizing the treatment following Achilles tendon rupture (Morten Tange Kristensen, co-supervisor).

**Simon Majormoen Bruhn:** Mr. Bruhn is a PhD-student at the University of Copenhagen. His PhD deals with the individualized treatment of knee osteoarthritis (Thomas Bandholm, co-supervisor).

**Linette Marie Kofod:** Ms. Kofod is a PhD-student at Örebro University, Sweden. Her PhD deals with dyspnea management in patients with COPD (Morten Tange Kristensen, co-supervisor).

**Aino Leegaard Andersen:** Ms. Andersen is a PhD-student at the University of Copenhagen. Her PhD deals with optimizing nutrition and medication in acutely admitted older medical patients (Mette Merete Pedersen, co-supervisor)

### **MSc-students supervised by people from PMR-C**

**Britt Stævnbo Pedersen:** Ms. Pedersen was an MSc-student (thesis defended) enrolled at the University of Copenhagen. Her MSc dealt with the mobility of older medical patients during hospitalization (Thomas Bandholm, main supervisor).

**Line Rokkedal Jønsson:** Ms. Rokkedal Jønsson was an MSc-student (thesis defended) enrolled at the University of Southern Denmark. Her MSc dealt with early and intensive mobilization to patients following Acute High-risk Abdominal surgery (AHA) (Morten Tange Kristensen, co-supervisor).

**Jack Dawkins:** Mr. Dawkins was an MSc-student (thesis defended) enrolled at Bath University, England. His MSc dealt with adductor strength after Copenhagen adduction exercise in footballers (Kristian Thorborg, main supervisor).

**Mads Thorup Langelund:** Mr. Langelund was an MSc-student (thesis defended) enrolled at the University of Copenhagen. His MSc dealt with the effect and safety of blood-flow restriction exercise in patients with knee injuries (Kristian Thorborg, main supervisor).

### **Research Assistants**

**Jonas Bak:** Mr. Bak is a research assistant at PMR-C in collaboration with Copenhagen Center for Health Technology (CACHET). His project deals with health technology (InjuryMap) to enhance recovery from acute ankle sprains.

**Birk Mygind Grønfeldt:** Mr. Grønfeldt is a research assistant at PMR-C. His project deals with coordinated non-surgical and surgical care of patients with end-stage knee osteoarthritis.

**Christian Ohrhammer Josefsen:** Mr. Josefsen is a research assistant with PMR-C. He assisted in preparing and completing a study validating activity monitors in older hospitalized patients.

## **Developmental and project therapists**

**Mette Røn Kristensen:** Ms. Røn Kristensen is the regional coordinator for CPOP in the Capital Region of Denmark and collaborates with PMR-C. She works with CPOP as a national clinical database and follow up program for children with cerebral palsy. She also takes part in research projects within the field of children with cerebral palsy.

**Louise Laursen:** Ms. Laursen is the regional coordinator for CPOP in the Capital Region of Denmark and collaborates with PMR-C. She works with CPOP as a national clinical database and follow up program for children with cerebral palsy. She also takes part in research projects within the field of children with cerebral palsy and developmental projects within the field of occupational therapy.

**Line Rokkedal Jønsson.** Ms. Rokkedal Jønsson is a development management physiotherapist with PMR-C. She works with medical/geriatric, respiratory, and acute high-risk abdominal surgery patients, where she also takes part in research projects.

**Linette Marie Kofod:** Ms. Kofod is a respiratory physiotherapist specialist with PMR-C. She works with pulmonary rehabilitation and research within the field of respiratory physiotherapy.

## **PMR-C affiliates**

**Jan Arnholtz Overgaard.** Mr. Overgaard is a research physiotherapist at the Department of Rehabilitation in the Municipality of Lolland, Denmark. His area of expertise is patients with hip fracture.

#### **4. ADVISORY BOARD**

PMR-C is proud to have an advisory board of highly esteemed researchers to advise the management of PMR-C. The members of the PMR-C advisory board are listed below. Their biographies can be found at <https://www.hvidovrehospital.dk/pmr-c/about/Pages/People.aspx>

**Per Hölmich, Professor, Dr Med Sci**

Professor Hölmich is Head of Sports Orthopaedic Research Center – Copenhagen (SORC-C), Amager and Hvidovre Hospital, University of Copenhagen, Denmark.

**Henrik Kehlet, Professor, Dr Med Sci**

Professor Kehlet is Head of The Lundbeck Foundation Centre for Fast-Track Hip and Knee Arthroplasty and Section of Surgical Pathophysiology, Rigshospitalet, Copenhagen, Denmark.

**Michael Kjær, Professor, Dr Med Sci**

Professor Kjær is Head of Institute of Sports Medicine – Copenhagen, Bispebjerg Hospital, Copenhagen, Denmark.

**Jens Bo Nielsen, Professor, Dr Med Sci**

Professor Nielsen is Head of Neural Control of Movement Laboratory, University of Copenhagen, Denmark.

## 5. PUBLICATIONS

### Published papers

Husted RS. Diagnosis, prevention and treatment of acute lateral ankle sprains. *Ugeskr Laeger*. 2019 Feb 18;181(8):V09180654.

Pedersen MM, Kjær-Sørensen P, Midtgaard J, Brown CJ, Bodilsen AC. A Danish version of the life-space assessment (LSA-DK) - translation, content validity and cultural adaptation using cognitive interviewing in older mobility limited adults. *BMC Geriatr*. 2019 Nov 15;19(1):312.

Quach LT, Ward RE, Pedersen MM, Leveille SG, Grande L, Gagnon DR, Bean JF. The Association Between Social Engagement, Mild Cognitive Impairment, and Falls Among Older Primary Care Patients. *Arch Phys Med Rehabil*. 2019 Aug;100(8):1499-1505.

Rycroft SS, Quach LT, Ward RE, Pedersen MM, Grande L, Bean JF. The Relationship Between Cognitive Impairment and Upper Extremity Function in Older Primary Care Patients. *J Gerontol A Biol Sci Med Sci*. 2019 Mar 14;74(4):568-574.

Wörner T, Clarsen B, Thorborg K, Eek F. Elite Ice Hockey Goalkeepers Have a High Prevalence of Hip and Groin Problems Associated With Decreased Sporting Function: A Single-Season Prospective Cohort Study. *Orthop J Sports Med*. 2019 Dec 18;7(12):2325967119892586.

Hulsbæk S, Ban I, Aasvang TK, Jensen JB, Kehlet H, Foss NB, Bandholm T, Kristensen MT. Preliminary effect and feasibility of physiotherapy with strength training and protein-rich nutritional supplement in combination with anabolic steroids in cross-continuum rehabilitation of patients with hip fracture: protocol for a blinded randomized controlled pilot trial (HIP-SAP1 trial). *Trials*. 2019 Dec 23;20(1):763.

Mosler AB, Kemp J, King M, Lawrenson PR, Semciw A, Freke M, Jones DM, Casartelli NC, Wörner T, Ishøi L, Ageberg E, Diamond LE, Hunt MA, Di Stasi S, Reiman MP, Drew M, Friedman D, Thorborg K, Leunig M, Bizzini M, Khan KM, Crossley KM, Agricola R, Bloom N, Dijkstra HP, Griffin D, Gojanovic B, Harris-Hayes M, Heerey JJ, Hölmich P, Impellizzeri FM, Kassarian A, Warholm KM, Mayes S, Moksnes H, Risberg MA, Scholes MJ, Serner A, van Klij P, Lewis CL. Standardised measurement of physical capacity in young and middle-aged active adults with hip-related pain: recommendations from the first International Hip-related Pain Research Network (IHIPRN) meeting, Zurich, 2018. *Br J Sports Med*. 2019 Dec 19;bjsports-2019-101457. [Epub ahead of print].

Esteve E, Clausen MB, Rathleff MS, Vicens-Bordas J, Casals M, Palahí-Alcàcer A, Hölmich P, Thorborg K. Prevalence and severity of groin problems in Spanish football: A prospective study beyond the time-loss approach. *Scand J Med Sci Sports*. 2019 Dec 17;10.1111/sms.13615. [Epub ahead of print].

Pedersen MM, Petersen J, Beyer N, Larsen HG, Jensen PS, Andersen O, Bandholm T; STAND-Cph collaborative group. A randomized controlled trial of the effect of supervised progressive cross-continuum strength training and protein supplementation in older medical patients: the STAND-Cph trial. *Trials*. 2019 Nov 28;20(1):655.

Wörner T, Thorborg K, Eek F. High prevalence of hip and groin problems in professional ice hockey players, regardless of playing position. *Knee Surg Sports Traumatol Arthrosc*. 2019 Nov 16;10.1007/s00167-019-05787-7. [Epub ahead of print].



Ishøi L, Thorborg K, Kraemer O, Hölmich P. The association between specific sports activities and sport performance following hip arthroscopy for femoroacetabular impingement syndrome: A secondary analysis of a cross-sectional cohort study including 184 athletes. *J Hip Preserv Surg.* 2019 Jun 5;6(2):124-133.

Kemp JL, Risberg MA, Mosler A, Harris-Hayes M, Serner A, Moksnes H, Bloom N, Crossley KM, Gojanovic B, Hunt MA, Ishøi L, Mathieu N, Mayes S, Scholes MJ, Gimpel M, Friedman D, Ageberg E, Agricola R, Casartelli NC, Diamond LE, Dijkstra HP, Di Stasi S, Drew M, Freke M, Griffin D, Heerey J, Hölmich P, Impellizzeri FM, Jones DM, Kassarian A, Khan KM, King MG, Lawrenson PR, Leunig M, Lewis CL, Warholm KM, Reiman MP, Semciw A, Thorborg K, van Klij P, Wörner T, Bizzini M. Physiotherapist-led treatment for young to middle-aged active adults with hip-related pain: consensus recommendations from the International Hip-related Pain Research Network, Zurich 2018. *Br J Sports Med.* 2019 Nov 15;bjsports-2019-101458. [Epub ahead of print].

Mikkelsen LR, Madsen MN, Rathleff MS, Thorborg K, Rossen CB, Kallemose T, Bandholm T. Pragmatic Home-Based Exercise after Total Hip Arthroplasty - Silkeborg: Protocol for a prospective cohort study (PHETHAS-1). Version 2. *F1000Res.* 2019 Jun 25;8:965.

Wollin M, Thorborg K, Drew M, Pizzari T. A novel hamstring strain injury prevention system: post-match strength testing for secondary prevention in football. *Br J Sports Med.* 2019 Oct 19;bjsports-2019-100707. [Epub ahead of print].

Ishøi L, Hölmich P, Thorborg K. Measures of hip muscle strength and rate of force development using a fixated handheld dynamometer: Intra-tester intra-day reliability of a clinical set-up. *Int J Sports Phys Ther.* 2019 Sep;14(5):715-723.

Barfod KW, Hansen MS, Hölmich P, Kristensen MT, Troelsen A. Efficacy of early controlled motion of the ankle compared with immobilisation in non-operative treatment of patients with an acute Achilles tendon rupture: an assessor-blinded, randomised controlled trial. *Br J Sports Med.* 2019 Oct 9;bjsports-2019-100709. [Epub ahead of print].

Ishøi L, Thorborg K, Kraemer O, Lund B, Mygind-Klavsen B, Hölmich P. Demographic and Radiographic Factors Associated With Intra-articular Hip Cartilage Injury: A Cross-sectional Study of 1511 Hip Arthroscopy Procedures. *Am J Sports Med.* 2019 Sep;47(11):2617-2625.

Andersen CW, Kristensen MT. Performance Stability and Interrater Reliability of Culturally Adapted 10-Meter Walking Test for Danes with Neurological Disorders. *J Stroke Cerebrovasc Dis.* 2019 Sep;28(9):2459-2467.

Jakobsen TL, Jakobsen MD, Andersen LL, Husted H, Kehlet H, Bandholm T. Quadriceps muscle activity during commonly used strength training exercises shortly after total knee arthroplasty: implications for home-based exercise-selection. *J Exp Orthop.* 2019 Jul 2;6(1):29.

Wörner T, Nilsson J, Thorborg K, Granlund V, Stålmán A, Eek F. Hip Function 6 to 10 Months After Arthroscopic Surgery: A Cross-sectional Comparison of Subjective and Objective Hip Function, Including Performance-Based Measures, in Patients Versus Controls. *Orthop J Sports Med.* 2019 Jun 12;7(6):2325967119844821.

Rathleff MS, Graven-Nielsen T, Hölmich P, Winiarski L, Krommes K, Holden S, Thorborg K. Activity Modification and Load Management of Adolescents With Patellofemoral Pain: A Prospective Intervention Study Including 151 Adolescents. *Am J Sports Med.* 2019 Jun;47(7):1629-1637.

Gravare Silbernagel K, Vicenzino BT, Rathleff MS, Thorborg K. Isometric exercise for acute pain relief: is it relevant in tendinopathy management? *Br J Sports Med.* 2019 Nov;53(21):1330-1331.

Witten A, Barfod KW, Thorborg K, Foverskov M, Clausen MB. [Subacromial impingement syndrome]. *Ugeskr Laeger.* 2019 Apr 1;181(14):V03180215.

Ariza-Vega P, Mora-Traverso M, Ortiz-Piña M, Ashe MC, Kristensen MT. Translation, inter-rater reliability, agreement, and internal consistency of the Spanish version of the cumulated ambulation score in patients after hip fracture. *Disabil Rehabil.* 2019 Mar 24;1-6.

Thorborg K, Hölmich P. [Examination and treatment of groin pain in athletes]. *Ugeskr Laeger.* 2019 Feb 18;181(8):V10180667.

Wörner T, Thorborg K, Eek F. Five-Second Squeeze Testing in 333 Professional and Semiprofessional Male Ice Hockey Players: How Are Hip and Groin Symptoms, Strength, and Sporting Function Related? *Orthop J Sports Med.* 2019 Feb 20;7(2):2325967119825858.

Jacobsen JS, Søballe K, Thorborg K, Bolvig L, Storgaard Jakobsen S, Hölmich P, Mechlenburg I. Patient-reported outcome and muscle-tendon pain after periacetabular osteotomy are related: 1-year follow-up in 82 patients with hip dysplasia. *Acta Orthop.* 2019 Feb;90(1):40-45.

Kristensen MT, Bloch ML, Jønsson LR, Jakobsen TL. Interrater reliability of the standardized Timed Up and Go Test when used in hospitalized and community-dwelling older individuals. *Physiother Res Int.* 2019 Apr;24(2):e1769.

Kemp JL, King MG, Barton C, Schache AG, Thorborg K, Roos EM, Scholes M, Grimaldi A, Semciw AI, Freke M, Risberg MA, Reiman MP, Mayes S, Pizzari T, Heerey JJ, Lawrenson PR, Ingelsrud LHH, Crossley KM. Is exercise therapy for femoroacetabular impingement in or out of FASHIoN? We need to talk about current best practice for the non-surgical management of FAI syndrome. *Br J Sports Med.* 2019 Oct;53(19):1204-1205.

Kristensen MT, Öztürk B, Röck ND, Ingeman A, Palm H, Pedersen AB. Regaining pre-fracture basic mobility status after hip fracture and association with post-discharge mortality and readmission-a nationwide register study in Denmark. *Age Ageing.* 2019 Mar 1;48(2):278-284.

Ussing A, Dahn I, Due U, Sørensen M, Petersen J, Bandholm T. Efficacy of Supervised Pelvic Floor Muscle Training and Biofeedback vs Attention-Control Treatment in Adults With Fecal Incontinence. *Clin Gastroenterol Hepatol.* 2019 Oct;17(11):2253-2261.e4.

Christensen KB, Thorborg K, Hölmich P, Clausen MB. Rasch validation of the Danish version of the shoulder pain and disability index (SPADI) in patients with rotator cuff-related disorders. *Qual Life Res.* 2019 Mar;28(3):795-800.

Ishøi L, Aagaard P, Nielsen MF, Thornton KB, Krommes KK, Hölmich P, Thorborg K. The Influence of Hamstring Muscle Peak Torque and Rate of Torque Development for Sprinting Performance in Football Players: A Cross-Sectional Study. *Int J Sports Physiol Perform.* 2019 May 1;14(5):665-673.

Bandholm T, Husted RS, Jakobsen TL. Letter to the editor regarding 'Is it necessary to perform prehabilitation exercise for patients undergoing total knee arthroplasty: meta-analysis of randomized controlled trials'. *Phys Sportsmed.* 2019 Feb;47(1):1.

Harøy J, Pope D, Clarsen B, Wiger EG, Øyen MG, Serner A, Thorborg K, Hölmich P, Andersen TE, Bahr R. Infographic. The Adductor Strengthening Programme prevents groin problems among male football players. *Br J Sports Med*. 2019 Jan;53(1):45-46.

O'Neill S, Radia J, Bird K, Rathleff MS, Bandholm T, Jorgensen M, Thorborg K. Acute sensory and motor response to 45-s heavy isometric holds for the plantar flexors in patients with Achilles tendinopathy. *Knee Surg Sports Traumatol Arthrosc*. 2019 Sep;27(9):2765-2773.

Harøy J, Clarsen B, Wiger EG, Øyen MG, Serner A, Thorborg K, Hölmich P, Andersen TE, Bahr R. The Adductor Strengthening Programme prevents groin problems among male football players: a cluster-randomised controlled trial. *Br J Sports Med*. 2019 Feb;53(3):150-157.

Hulsbæk S, Larsen RF, Rosthøj S, Kristensen MT. The Barthel Index and the Cumulated Ambulation Score are superior to the de Morton Mobility Index for the early assessment of outcome in patients with a hip fracture admitted to an acute geriatric ward. *Disabil Rehabil*. 2019 Jun;41(11):1351-1359.

Ariza-Vega P, Ortiz-Piña M, Kristensen MT, Castellote-Caballero Y, Jiménez-Moleón JJ. High perceived caregiver burden for relatives of patients following hip fracture surgery. *Disabil Rehabil*. 2019 Feb;41(3):311-318.

Kofod LM, Hage T, Christiansen LH, Skalkam K, Martinez G, Godtfredsen NS, Molsted S. Inspiratory muscle strength and walking capacity in patients with COPD. *Eur Clin Respir J* 2019 Dec 9;7.

Cramer A, Hansen MS, Sandholdt H, Jones PK, Christensen M, Jensen SML, Hölmich P, Barfod KW. Completeness and data validity in the Danish Achilles tendon Database. *Dan Med J*. 2019;66(6).

Kirk JW, Bodilsen AC, Sivertsen DM, Husted RS and Thørnhøj-Thomsen T. Disentangling the complexity of mobilization of older medical patients in routine practice: An ethnographic study in Denmark. 2019. *PLoS One*. 2019 Apr 16;14(4):e0214271.

## **Defended theses - supervised by people from PMR-C**

**Martin Wollin:** PhD-thesis, La Trobe University, Melbourne, Victoria, Australia. Thesis title: Athlete monitoring: a complementary prevention strategy for groin and hamstring injuries in elite football (Kristian Thorborg, co-supervisor).

**Britt Stævnso Pedersen:** MSc-thesis, University of Copenhagen. Thesis title: A mobility intervention: The mobility of older medical patients during hospitalization – a feasibility study (Thomas Bandholm, main supervisor).

**Jack Dawkins:** MSc-thesis, Bath University, England. Thesis title: Low dose Copenhagen adduction exercise and hip adduction strength in footballers (Kristian Thorborg, main supervisor).

**Mads Thorup Langelund:** MSc-thesis, University of Copenhagen. Thesis title: Rehabilitation with low load blood flow restriction training following knee surgery. (Kristian Thorborg, main supervisor).

**Line Rokkedal Jønsson:** MSc-thesis, University of Southern Denmark. Thesis title: Early intensive mobilization following Acute High-risk Abdominal surgery – a feasibility study (Morten Tange Kristensen, co-supervisor).

## 6. RESEARCH GRANTS

With people from PMR-C acting as main applicant, co-applicant, or named collaborator, we attracted a total of 4,764,973 DKK (639,593 Euro) in 2019 from a variety of funding bodies. Thank you very much for the support. The funding bodies included:

The International Olympic Committee (IOC) Grant Program: Grant to support the IOC Research Center Copenhagen: Centre for Injury Prevention and Athlete Protection as member of the IOC Medical Research Network 2019-2022. Main applicants: Professor Michael Kjær and Professor Per Hölmich. Co-applicants: Kristian Thorborg and Thomas Bandholm (2,756,640 DKK).

The Research Foundation (strategic funds), Amager and Hvidovre Hospital: TREATright study - The right treatment for the right patient at the right time. A prospective cohort study of 5,000 patients with knee osteoarthritis. Main applicant: Anders Troelsen, Clinical Orthopaedic Research Hvidovre (CORH), Department of Orthopaedic Surgery, named co-applicant from PMR-C, Thomas Bandholm (800,000 DKK).

The Capital Region of Denmark, cross-continuum funds: Coordinated conservative and surgical care of patients with end-stage knee osteoarthritis: a pragmatic approach. Main applicant: Thomas Bandholm, enclosed CV from PMR-C: Rasmus Skov Husted and Kristian Thorborg (500,000 DKK).

Næstved-Slagelse-Ringsted Hospitals Research fund: TREATright study - The right treatment for the right patient at the right time. A prospective cohort study of 5,000 patients with knee osteoarthritis. Main applicant: Henrik Schrøder, Department of Orthopaedic Surgery, Næstved Hospital, named co-applicant from PMR-C, Thomas Bandholm (250,000 DKK).

The Research Foundation (strategic funds), Amager and Hvidovre Hospital: Dyspnea Management during Activity in Patients with COPD. Main applicant: Linette Marie Kofod (200.000 DKK).

The Research Foundation (MVU funds), Amager and Hvidovre Hospital: Does rehabilitation after total knee replacements work? Main applicant: Birk Grønfeldt (121,000 DKK).

The Research Foundation (MVU funds), Amager and Hvidovre Hospital: Reduced elongation of the Achilles tendon after rupture is considered the key to optimized treatment. Main applicant: Maria Swennergren Hansen (150,000 DKK).

The Association of Danish Physiotherapists' Fund for Research, Education and Practice Development: The Pragmatic Home-Based Exercise after Total Hip Arthroplasty Silkeborg 1 trial (PHETHAS-1) Main applicant: Merete Nørgaard Madsen, Elective Surgery Centre, Silkeborg Regional Hospital, enclosed CV from PMR-C, Thomas Bandholm (75,000 DKK).

The Research Foundation (strategic funds), Amager and Hvidovre Hospital: Early cross continuum rehabilitation following surgery for hip fracture – current knowledge and exploration of a new multi-modal intervention. Main applicant: Signe Hulsbæk (69.000 DKK).

The Association of Danish Physiotherapists' Fund for Research, Education and Practice Development: Pelvic floor exercise in patients with fecal incontinence: Yes, it works - but for how long? Main applicant: Anja Ussing, The Parker Institute, Bispebjerg-Frederiksberg Hospital, enclosed CV from PMR-C, Thomas Bandholm (43,333 DKK).

## **7. INVITED TALKS**

Nutricia Symposium for Clinical Dietitians: ARoS, Aarhus, Denmark. Title: Physical Activity and older adults (Mette Merete Pedersen and Line Rokkedal Jønsson).

7<sup>th</sup> Enhanced Recovery after Surgery (ERAS) World Congress, Liverpool, UK. Title: Rehabilitation strategies and functional recovery after total hip and knee replacements. (Thomas Bandholm).

Research OsteoArthritis Denmark (ROAD) CAG symposium: State-of-the-art treatment of knee osteoarthritis, Copenhagen, Denmark. Title: Does rehabilitation after total knee replacements work? (Thomas Bandholm).

Research OsteoArthritis Denmark (ROAD) CAG symposium and workshop: Knee osteoarthritis: exercise and postoperative rehabilitation. Title: Rehabilitation after total knee replacements (Thomas Bandholm).

Musculoskeletal rehabilitation symposium, University College North (UCN). Title: Exercise to enhance recovery from total hip and knee replacements (Thomas Bandholm).

"Science for Lunch" arranged by the group of young researchers (GUF) at Amager and Hvidovre Hospital. Title: How to respond to peer review? (Thomas Bandholm, Kristian Thorborg and Mette Merete Pedersen).

"Science for Lunch" arranged by the group of young researchers (GUF) at Amager and Hvidovre Hospital. Title: How to plan clinical research? The PREPARE trial guide (Thomas Bandholm).

Southern Region of Denmark, Physical therapy meeting. Title: The orthopedic hip – Hip fractures (Morten Tange Kristensen).

Oslo Metropolitan University (OsloMET), Scientific day, Oslo, Norway. Title: Development and Validation of the Basic Amputee Mobility Score (BAMS) (Morten Tange Kristensen).

2<sup>nd</sup> National Norwegian Fragility Fracture Network meeting, Oslo, Norway. Title: Physical Therapists in a multidisciplinary team (Morten Tange Kristensen).

2<sup>nd</sup> National Norwegian Fragility Fracture Network meeting, Oslo, Norway. Title: Physical therapy after hip fracture - why, when and how - overview of the evidence (Morten Tange Kristensen).

2<sup>nd</sup> National Norwegian Fragility Fracture Network meeting, Oslo, Norway. Title: Use of standardized outcome measures for the assessment of function after hip Fracture (Morten Tange Kristensen).

2<sup>nd</sup> National Norwegian Fragility Fracture Network meeting, Oslo, Norway. Title: Exercise after surgery - (when) does strength training matter, recommended program for strength training after hip fracture. (Morten Tange Kristensen).

8<sup>th</sup> Fragility Fracture Network Global Congress, Oxford, UK (Pre-day physio SIG Workshop). Title: Progressive resistance exercise after hip fracture surgery - Why and how to do it to maximize outcome in clinical practice (Morten Tange Kristensen).

8<sup>th</sup> Fragility Fracture Network Global Congress, Oxford, UK (Full congress, Symposium). Title: Using physiotherapy measures for short-term follow-up (Morten Tange Kristensen).

8<sup>th</sup> Fragility Fracture Network Global Congress, Oxford, UK (Full congress, Workshop). Title: 3. Outcome measures recommended for clinical and research use by the American Physical Therapy Association, Clinical Practice Guidelines, PT Management of Older Adults with Hip Fracture. (Morten Tange Kristensen).

Third World Congress 2019 in Sports Physical Therapy in Vancouver. Symposium talk: Lower limb rehabilitation (Kristian Thorborg).

3<sup>rd</sup> GISPT (Italian Sports Physical Therapy Group) International Conference: Advances in Sports and Rehabilitation. Welcome lecture. (Kristian Thorborg).

3<sup>rd</sup> GISPT (Italian Sports Physical Therapy Group) International Conference: Advances in Sports and Rehabilitation. Symposium talk: Diagnosis and management of hamstring injuries (Kristian Thorborg).

3<sup>rd</sup> GISPT (Italian Sports Physical Therapy Group) International Conference: Advances in Sports and Rehabilitation. Symposium talk: Update on diagnosis, classification and management of groin injuries. What does published research tell us? (Kristian Thorborg).

Scandinavian Congress in Sports Medicine. Symposium talk: Screening for groin pain as part of secondary prevention strategy (Kristian Thorborg).

Research OsteoArthritis Denmark (ROAD) CAG symposium: State-of-the-art treatment of knee osteoarthritis, Copenhagen, Denmark. Title: Prevention of knee injuries (Kristian Thorborg).

8<sup>th</sup> Fragility Fracture Network Global Congress, Oxford, UK.  
Pre-day physio SIG workshop, Title: Progressive resistance exercise after hip fracture surgery - Why and how to do it to maximize outcome in clinical practice (Jan Arnholtz Overgaard).

Week of Health and Innovation (WHINN) 2019, Odense, Denmark. Home based healthcare - Digital prevention and rehabilitation services. Title: Deployment of tele rehabilitation services to the citizens in Lolland Municipality (Jan Arnholtz Overgaard).

Combined Sections Meeting (CSM) American Physical Therapy Association (APTA) 2019, Washington D.C., USA. Title: Physical therapy management of older adults with hip fracture - Clinical Practice Guideline (Morten Tange Kristensen and Jan Arnholtz Overgaard).

## **8. MAIN TEACHING AND COURSE ACTIVITIES**

6 weeks of course leading, tutoring, and lecturing. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen (Kristian Thorborg).

6 weeks of course leading. MSc course: Rehabilitation of muscle injuries. University of Southern Denmark, Odense, Denmark (Kristian Thorborg).

6 weeks of tutoring and lecturing. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen (Thomas Bandholm).

4-day Workshop in RedBull Salzburg Academy. Hip, groin and hamstring assessment and rehabilitation (Kristian Thorborg).

4-day course leading, tutoring and lecturing. Respiratory physiotherapy. Organizers: Danish Physiotherapists and Danish Society for Cardiac and Respiratory Physiotherapy (Linette Marie Kofod).

4-day course leading, tutoring and lecturing. Physical exercise and COPD. Organizers: Danish Physiotherapists and Danish Society for Cardiac and Respiratory Physiotherapy (Linette Marie Kofod).

3-day General Practitioners Organization (PLO) Education courses. Repeated course lecturing. COPD treatment in medical practice. (Linette Marie Kofod).

Single lecture: Seminar for medical nurses in the Capital Region of Denmark: Secretion clearance and dyspnea in patients with lung deceases (Linette Marie Kofod).

Single lecture: Update in Respiratory physiotherapy. Bornholms Hospital (Linette Marie Kofod).

Single lecture: Update in Respiratory physiotherapy. Sønderjyllands Hospital (Linette Marie Kofod).

Single lecture (held twice). MSc-course: Geriatrics. Cand.Med., University of Copenhagen. Topic: Physical activity and older adults (Mette Merete Pedersen).

Single lecture. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen. Topic: Basic exercise physiology (Thomas Bandholm).

Single lecture. Theme day: the clinical use of exercise. Municipality of Brøndby. Topic: Adaptations to strength training (Thomas Bandholm).

Single lecture: Danish Medical Association's course on sports medicine and sports orthopedics. Topic: Diagnostics, prophylactics and treatment of acute lateral ankle injuries in sports (Rasmus Skov Husted).

Single lecture. Theme day: the clinical use of exercise. Municipality of Brøndby. Topic: Adaptations to cardiovascular exercise (Thomas Bandholm).

Single lecture. Theme day: the clinical use of exercise. Municipality of Brøndby. Topic: Exercise before or after total hip and knee replacements (Thomas Bandholm).

Single lecture. Theme day: the clinical use of exercise. Municipality of Brøndby. Topic: Clinical applications of exercise therapy (Thomas Bandholm).

Single lecture. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen. Topic: What is problem-based learning? (Kristian Thorborg).

Single lecture. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen. Topic: Levels of evidence (Kristian Thorborg).

Single lecture. Theme day: the clinical use of exercise. Municipality of Brøndby. Topic: Exercise after hip fracture (Morten Tange Kristensen).

Single lecture. Course: Outcome measures for occupational and physical therapist. The Capital Region of Denmark, Copenhagen, Denmark. Topic: Reliability of outcome measures (Morten Tange Kristensen).

Single lecture. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen. Topic: Outcome measures – Theory and Practice (Morten Tange Kristensen).

Single lecture. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen. Topic: Age related loss of function in older people (Morten Tange Kristensen).



Single lecture. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen. Topic: The concept of rehabilitation (Morten Tange Kristensen).

Single lecture. MSc-course: Physical activity. Cand.Scient.San., University of Copenhagen. Topic: fall related problems in older people (Morten Tange Kristensen).

Single lecture. PhD-Course: University of Copenhagen. Topic: Pilot and feasibility studies. (Morten Tange Kristensen).

Single lecture. MSc-course: Cand. Scient. Fys., University of Southern Denmark, Odense. Topic: Quality development, assurance and implementation (Jan Arnholtz Overgaard).

Single lecture. MSc-course: Cand. Scient. Fys., University of Southern Denmark, Odense. Topic: Epidemiology of muscle injuries (Kristian Thorborg).

## **9. SYMPOSIA, COMPETITIONS, AND WORKSHOPS**

People from PMR-C organized, helped organize or hold the following in 2019:

### **Symposium: Annual Snekkersten Symposium**

The 2-day symposium marked the end of the year for the PhD graduate program Basic and Clinical Research in Musculoskeletal Sciences (MUSKOS), University of Copenhagen. Speakers included Professor Karyn Hamilton and Professor Chris Bell (Thomas Bandholm).

### **Oral presentation competition: Snekkersten PhD Cup**

The oral presentation competition was part of the annual 2-day symposium for the PhD graduate program: Basic and Clinical Research in Musculoskeletal Sciences (MUSKOS), University of Copenhagen, held in Snekkersten, Denmark. The 5 best rated abstracts were presented using a "how simple can you go-format" with 3 minutes to present and without any audiovisuals. Invited judges were: Associate Professor and Rhetorian Thea Sejr Hansen, Professor Ylva Hellsten, Professor Charlotte Suetta, Professor Per Hölmich and Rhetorian Mads Højlyng (Kristian Thorborg and Thomas Bandholm).

### **Oral presentation competition: Scandinavian Sports Medicine Congress**

The oral presentation competition was part of the Scandinavian Sports Medicine (#sportskongres) 2019 in Copenhagen, Denmark. The 6 best rated international conference abstracts were presented and formed a competition symposium. Invited judges were: Professor Ylva Hellsten (Translational Sports Medicine), Professor Taija Finni (Scand J Med Sci Sports), Dr. Clare Ardern (J Orthop Sports Phys Ther), Professor Karim Khan (Br J Sports Med), Professor Jon Karlsson (Knee Surg Sports Traumatol Arthrosc), Professor Michael Voight (Int J Sports Phys Ther), and Professor Daniel Wascher (Am J Sports Med) (Thomas Bandholm and Kristian Thorborg).

### **Symposium: How to present scientific results**

The symposium was part of the annual 2-day symposium for the PhD graduate program: Basic and Clinical Research in Musculoskeletal Sciences (MUSKOS), University of Copenhagen, held in Snekkersten, Denmark. Invited speakers were: Associate Professor and Rhetorian Thea Sejr Hansen and Rhetorian Mads Højlyng (Thomas Bandholm).

### **Session: Free oral presentations**

The session was part of the annual 2-day symposium for the PhD graduate program: Basic and Clinical Research in Musculoskeletal Sciences (MUSKOS), University of Copenhagen, held in Snekkersten, Denmark. Eight PhD-students presented their research, including Maria Swennergren Hansen and Rasmus Skov Husted (PMR-C) (Thomas Bandholm and Kristian Thorborg).

### **Symposium: Research and innovation in clinical practice**

The symposium was part of the annual research day at Copenhagen University Hospital, Amager and Hvidovre. Invited speakers were Professor Thomas Bandholm Postdoc Jeanette Wassar Kirk, Postdoc Mette Merete Pedersen and Departmental Head Nurse Kathrine Olesen (Mette Merete Pedersen and Thomas Bandholm).

### **Workshop: One-day physiotherapy Special Interest Group workshop**

The workshop was part of the 8<sup>th</sup> Fragility Fracture Network Global Congress, Oxford, UK. 13 researchers presented their work (Morten Tange Kristensen).

### **Symposium: Forum with Physiotherapy Societies**

The symposium was part of the 8<sup>th</sup> Fragility Fracture Network Global Congress, Oxford, UK. Speakers included Professor Sallie Lamb, Senior Researcher Morten Tange Kristensen, Head of Research and Development CSP Ruth Ten Hove and Senior Physiotherapist Michelle Fitzgerald (Morten Tange Kristensen).

### **Workshop: Measuring Recovery following Hip Fracture in Post-Acute Settings: What are the best Measures?**

The symposium was part of the 8<sup>th</sup> Fragility Fracture Network Global Congress, Oxford, UK. Speakers included Professor Lauren Beaupre, Senior Researcher Morten Tange Kristensen, Lecturer Lise Kronborg, Consultant Matthew Costa (Morten Tange Kristensen).

**Symposium: Clinical assessment of hip and groin pain- what does the evidence say?** The symposium was part of Scandinavian Congress in Sports Medicine 2019 (Kristian Thorborg)

### **Workshop: Novel approaches in ankle injury prevention**

The symposium was part of Scandinavian Congress in Sports Medicine 2019 (Kristian Thorborg).

## **10. CONGRESSES**

PMR-C helped organize the following congresses in 2019:

Scandinavian Sports Medicine Congress (#sportskongres) 2019, Copenhagen, Denmark. Scientific board members (Kristian Thorborg and Thomas Bandholm).

Third World Congress 2019 in Sports Physical Therapy in Vancouver (IFSPT and Kristian Thorborg co-organiser).

3<sup>rd</sup> GISPT (Italian Sports Physical Therapy Group) International Conference: Advances in Sports and Rehabilitation (Kristian Thorborg, Conference President).

4<sup>th</sup> World Congress of Sports Physiotherapy 2021, Nyborg, Denmark (Ongoing work: Kristian Thorborg and Thomas Bandholm).

## **11. ACADEMIC EVALUATION**

### **Positions**

Hiring committee member, Research Director (Danish university hospital) (Thomas Bandholm).

Assessment committee chair, Associate Professorships (22) in Health Sciences. University of Copenhagen, Copenhagen, Denmark (Thomas Bandholm).

Assessment committee chair, Clinical Professorship in Rheumatology, University of Copenhagen, Copenhagen, Denmark (Thomas Bandholm).

Search committee member, Clinical Professorship in Paediatrics, University of Copenhagen, Copenhagen, Denmark (Thomas Bandholm).

### **Theses**

Assessment committee member, PhD Thesis. University of Otago, Dunedin, New Zealand (Thomas Bandholm).

PhD progress evaluation, external assessor. University of Copenhagen, Denmark (Thomas Bandholm).

### **Editorial board work**

British Journal of Sports Medicine, International Journal of Sports Physical Therapy, and PLOS ONE (Kristian Thorborg, and Thomas Bandholm).

## **Ad-hoc peer-review work**

BMJ, Br J Sports Med, Int J Sports Med, Age and Ageing, [Journal of Cachexia, Sarcopenia and Muscle](#), Prosthetics & Orthotics International (Mette Merete Pedersen, Morten Tange Kristensen, and Thomas Bandholm).

## **12. ADVISORY OR OTHER BOARD-WORK**

Board member, Board for the PhD-graduate program: Basic and Clinical Research in Musculoskeletal Sciences (MUSKOS), University of Copenhagen (Thomas Bandholm).

Steering committee member, the National Database of Geriatrics (Mette Merete Pedersen).

Board member, Board of research, Amager and Hvidovre Hospital (Thomas Bandholm).

Executive committee member, Board of research, Amager and Hvidovre Hospital (Thomas Bandholm).

Executive board member and president, The International Federation of Sports Physical Therapy (Kristian Thorborg).

Advisory board member, IOC Diploma in Sports Physical Therapies (Kristian Thorborg).

Steering committee member, IOC Sports Medicine Copenhagen: Center for Injury Prevention and Protection of Athlete Health (Thomas Bandholm and Kristian Thorborg).

Steering committee member, Clinical Academic Group: Research OsteoArthritis Denmark (ROAD), Greater Copenhagen Health Science Partners (Thomas Bandholm).

Steering committee member, Clinical evidence and guidance in sports physiotherapy-catalogues. Danish Society for Sports Physiotherapists (Thomas Bandholm, Kristian Thorborg, and Rasmus Skov Husted).

Board member, Board for education and courses offered under the Danish Society for Sports Physiotherapists. Responsible for implementation of new educational structure for Danish Sports Physiotherapists from 2013 (40 ECTS) (Kristian Thorborg).

Board member, Board of education, University College Metropol, Copenhagen (Kristian Thorborg).

Working group member, working group for the development of Clinical Practice Guidelines for the physical therapy-management of persons with fragility fracture of the hip. A collaboration between the Academy of Geriatric Physical Therapy and the Orthopaedic Section of the American Physical Therapy Association, US (Morten Tange Kristensen and Jan Arnholtz Overgaard).

Steering committee member, The Nationwide Danish Multidisciplinary Hip Fracture Database (Morten Tange Kristensen).

Co-lead of the Fragility Fracture Network – special interest group for physiotherapists (Physio SIG) (Morten Tange Kristensen).

Expert group member, National expert group for improving quality of hip fracture treatment in Denmark (Morten Tange Kristensen and Jan Arnholtz Overgaard).

Advisory board member, National clinical guidelines, the Danish Health Authorities (Morten Tange Kristensen).

Steering committee member, networking group for development Physio – and Occupational Therapists in the eastern municipalities in Denmark (Jan Arnholtz Overgaard).

Board member of the Danish Society for Heart and Lung Physiotherapy (Linette Marie Kofod).

Steering committee member, Danish database for COPD (DrKOL) (Linette Marie Kofod).

Group member in the National Board of Health's Clinical Guidelines (NKR) for COPD rehabilitation (Linette Marie Kofod)

Committee member, Sports Medicine group in Danish Football Association (Kristian Thorborg).

### **13. THANK YOU**

**Henriette Møller and Mette Merete Pedersen**, Department of Clinical Research, Amager and Hvidovre Hospital for the proofread of the report.