



Research Annual Report 2011



Musculoskeletal Science Center (MUSC)

Immunological mechanisms and clinical epidemiology of early inflammatory arthritis and osteoarthritis

Measurement (of the results of intervention) in rehabilitation medicine

Efficiency and efficacy of trauma care

Efficiency and Efficacy of Emergency medicine and Trauma Care

EMC MUSC-01-31-01 - Immunological mechanisms and clinical epidemiology of early inflammatory arthritis and osteoarthritis

Programme (brief description)

The programme investigates immunological mechanisms and the clinical epidemiology regarding onset, course and outcomes of early (rheumatoid) arthritis and inflammatory osteoarthritis (OA). It aims to find determinants for disease onset and severity and subsequently to develop predictive algorithms for diagnosis and prognosis. In the scope of the disease course the effect of various medical and non-medical interventions are studied.

The molecular immunopathobiological mechanisms of onset, severity and modulation of chronic inflammatory destructive arthritis are studied with focus on the role of the IL-23/Th17 immune pathway, aging, osteoimmunology and hormones

Key Figures

<i>Department</i>	<i>Sp1</i>	<i>Sp2</i>	<i>Sp3</i>	<i>Sp4</i>	<i>SpTot</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>Ttot</i>	<i>IS</i>	<i>FS</i>	<i>OP</i>	<i>Ptot</i>
rheumatology	3,3	0,8	2,92	3,12	10,14								
Total	3,3	0,8	2,92	3,12	10,14	1	0	0	1	10	2	0	13

Thesis

Cornelissen, F.H.J. (2011, december 21). *The IL-23/IL-17 immune pathway in arthritis*. EUR (156 pag.). Prom./coprom.: Prof. Dr. J.M.W. Hazes & Dr. E. Lubberts.

Article/Letter to the editor

Alves, C., Luime, J.J., Zeven, D van, Huisman, A.M., Weel, A.E.A.M., Barendregt, P.J. & Hazes, J.M.W. (2011). Diagnostic performance of the ACR/EULAR 2010 criteria for rheumatoid arthritis and two diagnostic algorithms in an early arthritis clinic (REACH). *Annals of the Rheumatic Diseases*, 70(9), 1645-1647.

Boross, P, Arandhara, VL, Martin-Ramirez, J, Santiago-Raber, ML, Carlucci, F, Flierman, R, Kaa, J van der, Breukel, C., Claassens, JWC, Camps, M, Lubberts, E., Salvatori, D, Rastaldi, MP, Ossendorp, F, Daha, M.R., Cook, HT, Izui, S, Botto, M & Verbeek, JS (2011). The Inhibiting Fc Receptor for IgG, Fc gamma RIIB, Is a Modifier of Autoimmune Susceptibility. *Journal of Immunology*, 187(3), 1304-1313.

Emonts, M., Hazes, J.M.W., Houwing-Duistermaat, J.J., Jongh, C.E. de, Vogel, L.L. de, Han, HKH, Wouters, J.M.G.W., Laman, J.D. & Dolhain, R.J.E.M. (2011). Polymorphisms in genes controlling inflammation and tissue repair in rheumatoid arthritis: a case control study. *BMC Medical Genetics*, 12.

Geijn, F.E. van de, Man, Y.A. de, Wuhler, M, Willemsen, S.P., Deelder, A.M., Hazes, J.M.W. & Dolhain, R.J.E.M. (2011). Mannose-binding lectin does not explain the course and outcome of pregnancy in rheumatoid arthritis. *Arthritis Research & Therapy*, 13(1).

Geuskens, G.A., Burdorf, A., Barendregt, P.J. & Hazes, J.M.W. (2011). A high physical workload and high job demands hamper the good prognosis in physical functioning in persons with early inflammatory joint conditions. *Rheumatology*, 50(4), 789-798.

Hamburg, J.P. van, Asmawidjaja, P.S., Davelaar, N., Mus, A.M.C., Colin, E.M., Hazes, J.M.W., Dolhain, R.J.E.M. & Lubberts, E. (2011). Th17 Cells, but Not Th1 Cells, From Patients With Early Rheumatoid Arthritis Are Potent Inducers of Matrix Metalloproteinases and Proinflammatory Cytokines Upon Synovial Fibroblast Interaction, Including Autocrine Interleukin-17A Production. *Arthritis & Rheumatism*, 63(1), 73-83.

Hazes, J.M.W., Coulie, PG, Geenen, V, Vermeire, S, Carbonnel, F, Louis, E., Masson, P & Keyser, F De (2011). Rheumatoid arthritis and pregnancy: evolution of disease activity and pathophysiological considerations for drug use. *Rheumatology*, 50(11), 1955-1968.

Hazes, J.M.W. & Luime, J.J. (2011). The epidemiology of early inflammatory arthritis. *Nature reviews rheumatology*, 7(7), 381-390.

Koenders, MI, Marijnissen, RJ, Devesa, I, Lubberts, E., Joosten, LAB, Roth, J., Lent, PLEM van, Loo, FA van de & Berg, W.B. van den (2011). Tumor Necrosis Factor-Interleukin-17 Interplay Induces S100A8, Interleukin-1 beta, and Matrix Metalloproteinases, and Drives Irreversible Cartilage Destruction In Murine Arthritis Rationale for Combination Treatment During Arthritis. *Arthritis & Rheumatism*, 63(8), 2329-2339.

Man, Y.A. de, Dolhain, R.J.E.M., Steegers, E.A.P. & Hazes, J.M.W. (2011). Reumatische ziekten bij kinderwens en zwangerschap. *Nederlands Tijdschrift voor Geneeskunde*, 155.

Ostensen, M, Brucato, A, Carp, H, Chambers, C, Dolhain, R.J.E.M., Doria, A, Forger, F, Gordon, C, Hahn, S., Khamashta, M, Lockshin, MD, Matucci-Cerinic, M, Meroni, P, Nelson, JL, Parke, A, Petri, M, Raio, L, Ruiz-Irastorza, G, Silva, C.A., Tincani, A, Villiger, PM, Wunder, D & Cutolo, M (2011). Pregnancy and reproduction in autoimmune rheumatic diseases. *Rheumatology*, 50(4), 657-664.

Piscaer, T.M., Muller, C., Mindt, TL, Lubberts, E., Verhaar, J.A.N., Krenning, E.P., Schibli, R, Jong, M. de & Weinans, H.H. (2011). Imaging of Activated Macrophages in Experimental Osteoarthritis Using Folate-Targeted Animal Single-Photon-Emission Computed Tomography/Computed Tomography. *Arthritis & Rheumatism*, 63(7), 1898-1907.

EMC MUSC-01-46-01 - Measurement (of the results of intervention) in rehabilitation medicine

Programme (brief description)

Rehabilitation medicine is the medical specialism which concerns the diagnostic procedures and treatment of permanent, imminent and complex consequences of diseases, trauma and congenital deformities.

Research and development in rehabilitation medicine is to a large extent interdisciplinary and aims at research questions in the field of medicine, technology, psychology, physiotherapy, occupational therapy, sociology, etc. As a result the objective, reliable and valid measurement of impairment, disability and handicap has been developed insufficiently and existing methods are not appropriate for implementation in patient related research. The main points of the programme are:

1. The development, validation and application of new diagnostic instruments for the purpose of low back and pelvic complaints and for the purpose of pathology of the hand and wrist area.
2. The development, validation and application of long term ambulant registration of posture, movement, activity and cardiac stress for the purpose of patients with amputation, chronic pain, cardiac failure and the elderly.
3. The study of functional prognosis and outcome in patients with traumatic brain and spinal cord injury.
4. The study of physical, social and psychological impairment and disability in adolescents and adults with (congenital) disorders in childhood

Key Figures

<i>Department</i>	<i>Sp1</i>	<i>Sp2</i>	<i>Sp3</i>	<i>Sp4</i>	<i>SpTot</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>Ttot</i>	<i>IS</i>	<i>FS</i>	<i>OP</i>	<i>Ptot</i>
plastic and reconstructive surgery	0,1				0,1								
rehabilitation	1,98	2,15	2,45	2,8	9,38								
Total	2,08	2,15	2,45	2,8	9,48	3	0	0	3	23	2	2	30

Thesis

Korstanje, J.W.H. (2011, november 16). *Sound findings on hand dynamics*. EUR. Prom./coprom.: Prof. Dr. S.E.R. Hovius & Prof. Dr. H.J. Stam.

Nieuwenhuijsen, C. (2011, november 30). *Adults with cerebral palsy*. EUR. Prom./coprom.: Prof. Dr. H.J. Stam.

Wichers, M.J. (2011, oktober 19). *Epidemiology of cerebral palsy in the Netherlands*. EUR. Prom./coprom.: O. van Nieuwenhuizen & Prof. Dr. H.J. Stam.

Article/Letter to the editor

Bartels, B., Pangalila, R.F., Bergen, M.P., Cobben, N.A.M., Stam, H.J. & Roebroek, M.E. (2011). UPPER LIMB FUNCTION IN ADULTS WITH DUCHENNE MUSCULAR DYSTROPHY. *Journal of Rehabilitation Medicine*, 43(9), 770-775.

Beek, N.A.M.E. van der, Capelle, C.I. van, Etten, K.I. van, Hop, W.C.J., Berg, B. van den, Reuser, A.J.J., Doorn, P.A. van, Ploeg, A.T. van der & Stam, H. (2011). Rate of progression and predictive factors for pulmonary outcome in children and adults with Pompe disease. *Molecular Genetics and Metabolism*, 104, 129-136.

Berg-Emons, H.J.G. van den, L'Ortye, A.A.M.H.J., Buffart, L.M., Nieuwenhuijsen, C., Nooijen, C.F., Bergen, M.P., Stam, H.J. & Bussmann, J.B.J. (2011). Validation of the Physical Activity Scale for Individuals With Physical Disabilities. *Archives of Physical Medicine and Rehabilitation*, 92(6), 923-928.

Bussmann, J.B.J., Berg-Emons, H.J.G. van den & Stam, H.J. (2011). Beweggedrag van patiënten met chronische fysieke condities. *Nederlands Tijdschrift voor Revalidatie*, 33(1), 5-12.

Dijk, JW, Manders, RJF, Hartgens, F, Stehouwer, CD, Praet, S.F.E. & Loon, LJC van (2011). Postprandial hyperglycemia is highly prevalent throughout the day in type 2 diabetes patients. *Diabetes Research & Clinical Practice*, 93(1), 31-37.

Eckhardt, M.M.E.M., Borgerhoff Mulder, M.C., Horemans, H.L.D., Woude, LH van der & Ribbers, G.M. (2011). The effects of high custom made shoes on gait characteristics and patient satisfaction in hemiplegic gait. *Gait & Posture*, 34(4), 543-547.

Favejee, M.M., Huisstede, B.M.A. & Koes, B.W. (2011). Frozen shoulder: the effectiveness of conservative and surgical interventions-systematic review. *British Journal of Sports Medicine*, 45(1), 49-56.

Gebremariam, L., Hay, EM, Koes, B.W. & Huisstede, B.M.A. (2011). Effectiveness of Surgical and Postsurgical Interventions for the Subacromial Impingement Syndrome: A Systematic Review. *Archives of Physical Medicine and Rehabilitation*, 92(11), 1900-1913.

Groot, S. de, Post, MWM, Bussmann, J.B.J., Janssen, TWJ, Adriaansen, JJE, Kooijmans, H., Scheer, JW van der, Bakkum, AJT & Woude, LH van der (2011). Onderzoeksproject: Active Lifestyle Rehabilitation Intervention in aging persons with Spinal Cord injury (ALLRISC). *Nederlands Tijdschrift voor Revalidatie*, 3, 8-13.

Hovius, S.E.R., Kan, H.J., Smit, X., Selles, R.W., Cardoso, E & Khouri, R.K. (2011). Extensive Percutaneous Aponeurotomy and Lipografting: A New Treatment for Dupuytren Disease. *Plastic and Reconstructive Surgery*, 128(1), 221-228.

Huisstede, B.M.A., Hoogvliet, P., Paulis, W.D., Middelkoop, M. van, Hausman, M, Coert, J.H. & Koes, B.W. (2011). Effectiveness of Interventions for Secondary Raynaud's Phenomenon: A Systematic Review. *Archives of Physical Medicine and Rehabilitation*, 92(7), 1166-1180.

Huisstede, B.M.A., Gebremariam, L., Sande, R. van der, Hay, EM & Koes, B.W. (2011). Evidence for effectiveness of Extracorporeal Shock-Wave Therapy (ESWT) to treat calcific and non-calcific rotator cuff tendinosis - A systematic review. *Manual Therapy*, 16(5), 419-433.

Hurkmans, H.L.P., Ribbers, G.M., Streur-Kranenburg, MF, Stam, H.J. & Berg-Emons, H.J.G. van den (2011). Energy expenditure in chronic stroke patients playing Wii Sports: a pilot study. *Journal of Neuroengineering and Rehabilitation*, 8.

Kwakkel, G., Veerbeek, JM, Wel, B.C. van der, Wegen, E van & Kollen, BJ (2011). Diagnostic Accuracy of the Barthel Index for Measuring Activities of Daily Living Outcome After Ischemic Hemispheric Stroke Does Early Poststroke Timing of Assessment Matter? *Stroke*, 42(2), 342-346.

Langeveld, SA van, Post, MW, Asbeck, FW Van, Gregory, M, Halvorsen, A, Rijken, H., Leenders, J, Postma, K. & Lindeman, E (2011). Comparing Content of Therapy for People With a Spinal Cord Injury in Postacute Inpatient Rehabilitation in Australia, Norway, and the Netherlands. *Physical Therapy*, 91(2), 210-224.

Michielsen, M.E., Selles, R.W., Geest, J.N. van der, Eckhardt, M., Yavuzer, M.G., Stam, H.J., Smits, M., Ribbers, G.M. & Bussmann, J.B.J. (2011). Motor Recovery and Cortical Reorganization After Mirror Therapy in Chronic Stroke Patients: A Phase II Randomized Controlled Trial. *Neurorehabilitation and Neural Repair*, 25(3), 223-233.

Michielsen, M.E., Smits, M., Ribbers, G.M., Stam, H.J., Geest, J.N. van der, Bussmann, J.B.J. & Selles, R.W. (2011). The neuronal correlates of mirror therapy: an fMRI study on mirror induced visual illusions in patients with stroke. *Journal of Neurology Neurosurgery and Psychiatry*, 82(4), 393-398.

Molenaar, H.M., Selles, R.W., Willemsen, S.P., Hovius, S.E.R. & Stam, H.J. (2011). Growth Diagrams for Individual Finger Strength in Children Measured with the RIHM. *Clinical Orthopaedics & Related Research*, 469(3), 868-876.

Nieuwenhuijsen, C., Slot, W.M.A. van der, Dallmeijer, AJ, Janssens, PJ, Stam, H.J., Roebroek, M.E. & Berg-Emons, H.J.G. van den (2011). Physical fitness, everyday physical activity, and fatigue in ambulatory adults with bilateral spastic cerebral palsy. *Scandinavian Journal of Medicine & Science in Sports*, 21(4), 535-542.

Paulis, W.D., Horemans, H.L.D., Brouwer, BS & Stam, H.J. (2011). Excellent test-retest and inter-rater reliability for Tardieu Scale measurements with inertial sensors in elbow flexors of stroke patients. *Gait & Posture*, 33(2), 185-189.

Putter, C.E. de, Beeck, E.F. van, Looman, C.W.N., Toet, H., Hovius, S.E.R. & Selles, R.W. (2011). Trends in Wrist Fractures in Children and Adolescents, 1997-2009. *Journal of Hand Surgery-American Volume*, 36A(11), 1810-1815.

Verschuren, O, Ketelaar, M, Keefer, D, Wright, V, Butler, J, Ada, L, Maher, C, Reid, S, Wright, M., Dalziel, B, Wiart, L, Fowler, E, Unnithan, V, Maltais, DB, Berg-Emons, H.J.G. van den & Takken, T. (2011). Identification of a core set of exercise tests for children and adolescents with cerebral palsy: a Delphi survey of researchers and clinicians. *Developmental Medicine & Child Neurology*, 53(5), 449-456.

Vissers, M.M., Bussmann, J.B.J., Verhaar, J.A.N., Arends, L.R., Furlan, AD & Reijman, M. (2011). Recovery of Physical Functioning After Total Hip Arthroplasty: Systematic Review and Meta-Analysis of the Literature. *Physical Therapy*, 91(5), 615-629.

Vissers, M.M., Bussmann, J.B.J., Groot, I.B. de, Verhaar, J.A.N. & Reijman, M. (2011). Walking and chair rising performed in the daily life situation before and after total hip arthroplasty. *Osteoarthritis and Cartilage*, 19(9), 1102-1107.

Wiegerink, D.J.H.G., Roebroek, M.E., Bender, J, Stam, H.J. & Cohen-Kettenis, P (2011). Sexuality of Young Adults with Cerebral Palsy: Experienced Limitations and Needs. *Sexuality and Disability*, 29(2), 119-128.

Part of book - abstract

Bussmann, J.B.J. & Ebner-Priemer, UW (2011). Ambulatory Assessment of Movement Behavior: Methodology, Measurement, and Application. In *Handbook of Research Methods for Studying Daily Life*. --.

Praet, S.F.E., Rozenberg, R. & Loon, LJC van (2011). Exercise therapy for Type 2 Diabetes. In J.M. Saxton (Ed.), *Exercise and Chronic Disease: an evidence-based approach* (pp. 265-296). U.K.: Routledge.

EMC MUSC-01-47-01 - Efficiency and efficacy of trauma care

Programme (brief description)

The main objective of this programme is to investigate the efficiency and efficacy of management and treatment approaches for trauma patients.

The basic research projects aim at getting insight into fracture healing.

Fractures that do not heal uncomplicated often require bone grafting. Literature data of bone substitute materials available in the Netherlands will be collected. The biomechanical and biological characteristics in vivo will be determined to support a clinical guideline. New titanium MESH material will be evaluated in a biomechanical and in vivo setting.

Advanced trauma life support (ATLS) propagates the use of pelvic circumferential compression devices (PCCDs) for reducing and stabilizing pelvic fractures, however their clinical benefits and risks are largely unknown. The mechanical effects, the quality of pelvic reduction and the decubitus risk of PCCDs will be determined.

The aim of the clinical research projects is to compare management approaches for several fracture and injury types using prospective multi-centre randomized and cohort studies.

Multicenter RCTs: (1) Clinical- and cost-effectiveness of internal fixation (cancellous screws versus sliding hip screw) of femoral neck fractures; (2) Clinical- and cost-effectiveness of hemi-arthroplasty (HA) versus total hip arthroplasty of femoral neck fractures; (3) Clinical- and cost-effectiveness of HA versus conservative treatment of comminuted proximal humeral fractures; (4) Functional after-treatment versus cast-immobilization of simple elbow dislocations; (5) Outcome after open reduction and internal fixation versus percutaneous surgery versus conservative treatment of displaced intra-articular calcaneal fractures.

Multicenter cohort study: outcome of treatment of persistently unstable complex elbow dislocations after fracture fixation using a hinged elbow fixator will be studied.

Three projects aim at identifying patients at risk for complications:

-Patients with low single nucleotide polymorphisms in immune response genes are at risk of developing serious infectious complication after transplantation or ICU admission. This association will be investigated in polytraumatized patients.

-The second project deals with elderly patients reporting to the ED after they fell. The effects of withdrawal of fall-inducing drugs on recurrent falls will be investigated.

-Topic of the third study is to evaluate biomarkers for timely indication of abdominal hypertension, which is a frequently missed syndrome that can lead to multiorgan failure if left untreated.

An international research collaboration and exchange program with the RuiJin Hospital (Shanghai, China, Emergency Department (ED) and Burn Center) has been established.

In preclinical research projects the added value of assistance by Helicopter Emergency Medical Services (HEMS) on outcome and quality of life will be studied in polytraumatized patients. Effects, costs and benefits will be investigated and the dispatch and cancel protocols will be evaluated.

Key Figures

<i>Department</i>	<i>Sp1</i>	<i>Sp2</i>	<i>Sp3</i>	<i>Sp4</i>	<i>SpTot</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>Ttot</i>	<i>IS</i>	<i>FS</i>	<i>OP</i>	<i>Ptot</i>
internal medicine		0,5			0,5								
surgery	1,95	0,6	1,2	1,4	5,15								
Total	1,95	1,1	1,2	1,4	5,65	1	1	0	2	28	13	6	49

Thesis

Haan, J de (2011, november 16). *Traumatic dislocation of the elbow joint*. EUR (194 pag.).

Prom./coprom.: Prof. Dr. P. Patka & Dr. D. den Hartog.

Hartholt, K.A. (2011, september 21). *Falls and drugs in the older population: medical and societal consequences*. EUR. Prom./coprom.: Dr. T.J.M. van der Cammen & Prof. Dr. P. Patka.

Article/Letter to the editor

- Blommers, E., Klimek, M., Hartholt, K.A., Cammen, T.J.M. van der, Klein, J. & Noordzij, P.G. (2011). Perioperative care of the older patient. *Zeitschrift für Gerontologie und Geriatrie*, 44(3), 187-191.
- Burgers, P.T.P.W., Riel, M.P.J.M. van, Vogels, L.M.M., Stam, R., Patka, P. & Lieshout, E.M.M. van (2011). Rigidity of unilateral external fixators-A biomechanical study. *Injury-International Journal of the Care of the Injured*, 42(12), 1449-1454.
- Burgers, P.T.P.W. & Gijn, J. van (2011). Sir John Charnley en de totale heuparthroplastiek. *Nederlands Tijdschrift voor Geneeskunde*, 155(38).
- Cakir, H., Vliet-Koppert, ST Van, Lieshout, E.M.M. van, Vries, M.R. de, Elst, M. van der & Schepers, T. (2011). Demographics and outcome of metatarsal fractures. *Archives of Orthopaedic and Trauma Surgery*, 131(2), 241-245.
- Folmer, W.H., Lammers, W.J., Mulligan, T., Lieshout, E.M.M. van, Patka, P., Xu, Z. & Lu, Y. (2011). Patient demographics in acute care surgery at the Ruijin Hospital, Shanghai. *ISRN Surgery*.
- Ginhoven, T.M. van, Morks, AN, Schepers, T., Graaf, P.W. de & Smit, PC (2011). Surgeon-Performed Ultrasound as Preoperative Localization Study in Patients with Primary Hyperparathyroidism. *European Surgical Research*, 47(2), 70-74.
- Haan, J de, Schep, N.W.L., Tuinebreijer, W.E., Patka, P. & Hartog, D. den (2011). Rasch analysis of the Dutch version of the Oxford elbow score. *Patient Related Outcome Measures*, 2, 145-149.
- Haan, J de, Schep, N.W.L., Eygendaal, D., Kleinrensink, G.J., Tuinebreijer, W.E. & Hartog, D. den (2011). Stability of the elbow joint: relevant anatomy and clinical implications of in vitro biomechanical studies. *Open Orthopaedics Journal*, 5, 168-176.
- Haan, J de, Goei, H., Schep, N.W.L., Tuinebreijer, W.E., Patka, P. & Hartog, D. den (2011). The reliability, validity and responsiveness of the Dutch version of the Oxford elbow score. *Journal of Orthopaedic Surgery and Research*, 6(1).
- Hartholt, K.A., Val, J.J., Looman, C.W.N., Petrovic, M, Schakel, A & Cammen, T.J.M. van der (2011). BETTER DRUG KNOWLEDGE WITH FEWER DRUGS, BOTH IN THE YOUNG AND THE OLD. *Acta Clinica Belgica*, 66(5), 367-370.
- Hartholt, K.A., Velde, N. van der, Lieshout, E.M.M. van, Polinder, S., Vries, O.J. de, Boye, N.D.A., Kerver, A.J.H., Zieme, G., Buijninx, MMM, Vries, M.R. de, Mattace Raso, F.U.S., Uitterlinden, A.G., Beeck, E.F. van, Lips, P., Patka, P. & Cammen, T.J.M. van der (2011). [Cost]effectiveness of withdrawal of fall-risk increasing drugs versus conservative treatment in older fallers: design of a multicenter randomized controlled trial (IMPROVeFALL-study). *BMC Geriatrics*, 11(1), 48.
- Hartholt, K.A., Stevens, JA, Polinder, S., Cammen, T.J.M. van der & Patka, P. (2011). Increase in Fall-Related Hospitalizations in the United States, 2001-2008. *Journal of Trauma-Injury Infection and Critical Care*, 71(1), 255-258.
- Hartholt, K.A., Lieshout, E.M.M. van, Polinder, S., Panneman, MJM, Cammen, T.J.M. van der & Patka, P. (2011). Rapid Increase in Hospitalizations Resulting from Fall-Related Traumatic Head Injury in Older Adults in the Netherlands 1986-2008. *Journal of Neurotrauma*, 28(5), 739-744.
- Hartholt, K.A., Beeck, E.F. van, Polinder, S., Velde, N. van der, Lieshout, E.M.M. van, Panneman, MJM, Cammen, T.J.M. van der & Patka, P. (2011). Societal Consequences of Falls in the Older Population: Injuries, Healthcare Costs, and Long-Term Reduced Quality of Life. *Journal of Trauma-Injury Infection and Critical Care*, 71(3), 748-753.

Hartholt, K.A., Oudshoorn, C., Zielinski, S.M., Burgers, P.T.P.W., Panneman, MJM, Beeck, E.F. van, Patka, P. & Cammen, T.J.M. van der (2011). The Epidemic of Hip Fractures: Are We on the Right Track? *PLoS One*, 6(7).

Hartholt, K.A., Lieshout, E.M.M. van, Thies, W.C., Patka, P. & Schipper, I.B. (2011). Intraosseous devices: a randomized controlled trial comparing three intraosseous devices. *Nederlands Tijdschrift voor Traumatologie*, 19(1), 22.

Hartog, D. den, Tuinebreijer, W.E., Oprel, P. & Patka, P. (2011). Acute traumatic abdominal wall hernia. *Hernia*, 15(4), 443-445.

Hartog, D. den & Patka, P. (2011). Behandeling van proximale humerusfracturen bij volwassenen. *Nederlands Tijdschrift voor Heelkunde*, 20(4), 144-145.

Knops, S.P., Schep, N.W.L., Spoor, C.W., Riel, M.P.J.M. van, Spanjersberg, W.R., Kleinrensink, G.J., Lieshout, E.M.M. van, Patka, P. & Schipper, I.B. (2011). Comparison of Three Different Pelvic Circumferential Compression Devices: A Biomechanical Cadaver Study. *Journal of Bone and Joint Surgery-American Volume*, 93A(3), 230-240.

Knops, S.P., Lieshout, E.M.M. van, Spanjersberg, W.R., Patka, P. & Schipper, I.B. (2011). Randomised clinical trial comparing pressure characteristics of pelvic circumferential compression devices in healthy volunteers. *Injury-International Journal of the Care of the Injured*, 42(10), 1020-1026.

Knops, S.P., Patka, P., Schepers, T. & Lieshout, E.M.M. van (2011). Bekkenbanden voor acute stabilisatie van instabiele bekkenfracturen. *Nederlands Tijdschrift voor Traumatologie*, 19(5), 126-131.

Kreis, BE, Castano, NJY, Tuinebreijer, W.E., Hoogenboom, LCA, Meylaerts, SAG & Rhemrev, SJ (2011). Characteristics of polytrauma patients with posttraumatic stress disorder in a level 1 trauma center. *European Journal of Trauma and Emergency Surgery*, 37(3), 269-275.

Lammers, W.J., Folmer, W.H., Lieshout, E.M.M. van, Christiaanse, J.C., Hartog, D. den, Tong, J., Lu, Y. & Patka, P. (2011). Demographic analysis of emergency department patients at the Ruijin hospital Shanghai. *Emergency Medicine International*.

Lieshout, E.M.M. van, Kralingen, G.H. van, El-Massoudi, Y., Weinans, H.H. & Patka, P. (2011). Microstructure and biomechanical characteristics of bone substitutes for trauma and orthopaedic surgery. *BMC Musculoskeletal Disorders*, 12.

Mulder, I.M. & Vermeulen, J. (2011). Treatment Options for Perforated Colonic Diverticular Disease. *CML - Gastroenterology*, 30(3), 77-84.

Ramshorst, G.H. van, Salih, M., Hop, W.C.J., Waes, O.J.F. van, Kleinrensink, G.J., Goossens, R.H.M. & Lange, J.F. (2011). Noninvasive Assessment of Intra-Abdominal Pressure by Measurement of Abdominal Wall Tension. *Journal of Surgical Research*, 171(1), 240-244.

Ringburg, A.N., Polinder, S., Ierland, M.C.P. van, Steyerberg, E.W., Lieshout, E.M.M. van, Patka, P., Beeck, E.F. van & Schipper, I.B. (2011). Prevalence and Prognostic Factors of Disability After Major Trauma. *Journal of Trauma-Injury Infection and Critical Care*, 70(4), 916-922.

Ringburg, A.N., Polinder, S., Steyerberg, E.W., Lieshout, E.M.M. van, Patka, P., Beeck, E.F. van & Schipper, I.B. (2011). Voorspellende factoren van functionele beperkingen na ernstig letsel. *Nederlands Tijdschrift voor Geneeskunde*, 155(18).

Ringburg, A.N., Polinder, S., Steyerberg, E.W., Lieshout, E.M.M. van, Patka, P., Beeck, E.F. van & Schipper, I.B. (2011). Voorspellende factoren van functionele beperkingen na ernstig letsel. *Nederlands Tijdschrift voor Geneeskunde*, 155(18).

Schep, N.W.L., Haan, J de, Iordens, G.I.T., Tuinebreijer, W.E., Bronkhorst, M.W.G.A., Vries, M.R. de, Goslings, JC, Ham, SJ, Rhemrev, S, Roukema, GR, Schipper, I.B., Sintenie, JB, Meulen, HGWM Van der, Thiel, TPH Van, Vugt, A.B. van, Verleisdonk, EJMM, Vroemen, JPAM, Wittich, P, Patka, P., Lieshout, E.M.M. van & Hartog, D. den (2011). A hinged external fixator for complex elbow dislocations: A multicenter prospective cohort study. *BMC Musculoskeletal Disorders*, 12.

Schepers, T., Lieshout, E.M.M. van, Vries, M.R. de & Elst, M.P.M. (2011). Complications of Syndesmotic Screw Removal. *Foot & Ankle International*, 32(11), 1040-1044.

Schepers, T. (2011). Dr. Schepers' invited commentary. *Journal of Foot & Ankle Surgery*, 50(1), 1.

Schepers, T., Schie-van der Weert, E.M. van, Vries, M.R. de & Elst, M van der (2011). Foot and ankle fractures at the supination line. *The Foot*, 21, 124-128.

Schepers, T., Vogels, L.M.M. & Lieshout, E.M.M. van (2011). Hemi-Castaing ligamentoplasty for the treatment of chronic lateral ankle instability: a retrospective assessment of outcome. *International Orthopaedics*, 35(12), 1805-1812.

Schepers, T., Lieshout, E.M.M. van, Vries, M.R. de & Elst, M van der (2011). Increased rates of wound complications with locking plates in distal fibular fractures. *Injury-International Journal of the Care of the Injured*, 42(10), 1125-1129.

Schepers, T., Rooij, P.P. de, Lieshout, E.M.M. van & Patka, P. (2011). Reinsertion of an Inverted Osteochondral Lesion of the Talus: A Case Report. *Journal of Foot & Ankle Surgery*, 50(4), 486-489.

Schepers, T. (2011). The sinus tarsi approach in displaced intra-articular calcaneal fractures: a systematic review. *International Orthopaedics*, 35(5), 697-703.

Schepers, T. (2011). To retain or remove the syndesmotic screw: a review of literature. *Archives of Orthopaedic and Trauma Surgery*, 131(7), 879-883.

Schepers, T. & Koning, J. (2011). Het klieven van de buigpees bij ulcera van de tenen. *WCS Nieuws*, 27(3), 50-52.

Spanjersberg, W.R., Knops, S.P., Schep, N.W.L., Lieshout, E.M.M. van, Patka, P. & Schipper, I.B. (2011). Effectiveness and complications of pelvic circumferential compression devices in patients with unstable pelvic fractures: a systematic review of literature. *Nederlands Tijdschrift voor Traumatologie*, 19(4), 116.

Stegeman, SA, Jong, M. de, Sier, CFM, Krijnen, PAJ, Duijff, JW, Thiel, TPH Van, Rijcke, P.A.R. de, Soesman, NMR, Hagenaars, T., Boekhoudt, FD, Vries, M.R. de, Roukema, GR, Tanka, AFK, Bremer, J van den, Meulen, HGWM Van der, Bronkhorst, M.W.G.A., Dijkman, BA van, Zutphen, SWAM van, Vos, DI, Schep, N.W.L., Eversdijk, M.G., Olden, GDJ van, Brand, JGH Van den, Hillen, RJ, Frolke, JPM & Schipper, I.B. (2011). Displaced midshaft fractures of the clavicle: non-operative treatment versus plate fixation (Sleutel-TRIAL). A multicentre randomised controlled trial. *BMC Musculoskeletal Disorders*, 12.

Stok, J. van der, Lieshout, E.M.M. van, El-Massoudi, Y., Kralingen, G.H. van & Patka, P. (2011). Bone substitutes in the Netherlands - A systematic literature review. *Acta Biomaterialia*, 7(2), 739-750.

Vermeulen, J., Gosselink, M.P., Hop, W.C.J., Harst, E. van der, Hansen, B.E., Mannaerts, G.H.H., Coene, P.PLO, Weidema, W.F. & Lange, J.F. (2011). Long-term survival after perforated diverticulitis. *Colorectal Disease*, 13(2), 203-209.

Vliet-Koppert, ST Van, Cakir, H, Lieshout, E.M.M. van, Vries, M.R. de, Elst, M van der & Schepers, T. (2011). Demographics and Functional Outcome of Toe Fractures. *Journal of Foot & Ankle Surgery*, 50(3), 307-310.

Vochteloo, AJH, Moerman, S, Borger van der Burg, A.E., Boo, M. de, Vries, M.R. de, Niesten, D.D., Tuinebreijer, W.E., Nelissen, RGHH & Pilot, P (2011). Delirium risk screening and haloperidol prophylaxis program in hip fracture patients is a helpful tool in identifying high-risk patients, but does not reduce the incidence of delirium. *BMC Geriatrics*, 11.

Vochteloo, AJH, Burg, BLSB van der, Mertens, BJA, Niggebrugge, AHP, Vries, M.R. de, Tuinebreijer, W.E., Bloem, RM, Nelissen, RGHH & Pilot, P (2011). Outcome of hip fracture patients related to anemia at admission and allogeneic blood transfusion: an analysis of 1262 surgically treated patients. *BMC Musculoskeletal Disorders*, 12(1), 262.

Waes, O.J.F. van & Morak, M.J.M. (2011). Afgaans "Wild Life". *Nederlands Tijdschrift voor Heelkunde*, 20(5), 191-192.

EMC MUSC-01-48-01 - Efficiency and Efficacy of Emergency medicine and Trauma Care

Programme (brief description)

The **basic research** projects aim at gaining insight into wound healing and accident victim management.

Written data on both subjects available in the Netherlands will be collected. The social and biological characteristics will be determined to support [create clinical guidelines]. According to the Advanced trauma life support (ATLS) guidelines the immobilisation of accident victims on spinal board results in improvement of vital parameters and reduction of complications and pain. However these clinical benefits and associated risks are largely unknown. The mechanical effects, the decubitus risk and the influence on pain relieve of spinal transport boards will be determined.

The **clinical research** projects compare management approaches for several acute disorders and injury types using prospective multi-centre randomized and cohort studies.

Multicenter RCTs: (1) Barriers and facilitators for early treatment of pain in trauma patients; (2) Clinical- and cost-effectiveness of frequent users versus regular ED population; (3) Sterile versus clean traumatic wound treatment.

Four projects aim at identifying patients at risk of complications:

- Early recognition and treatment of pneumonia and sepsis in the ED is an important factor in saving lives and preventing serious acute complications. This association will be investigated in infectious ED patients where also screening protocols will be validated for the situation in the Netherlands.
- The second project deals with elderly patients reporting to the emergency department for medical assessment after they have experienced a fall. As these patients may be at risk of falling again, the effects of withdrawal of fall-inducing drugs will be investigated.
- Alcohol and drug intoxication among ED trauma and accident patients. This is a serious problem in young but also in older- and aging populations. Focus on intoxication in relation to accidents and injuries will result in more specific prevention programmes.
- Prevalence and characteristics of patients who frequently visit the ED. This study aims at detecting predictors for high healthcare costs relating to frequent ED visits.

In **preclinical research** projects the added value of intervention on outcome and quality of life will be studied in aging patients and in patients with a high utilisation rate of ED services (multi user population). Effects, costs and benefits will be investigated and the prevention and treatment protocols will be evaluated.

Key Figures

<i>Department</i>	<i>Sp1</i>	<i>Sp2</i>	<i>Sp3</i>	<i>Sp4</i>	<i>SpTot</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>Ttot</i>	<i>IS</i>	<i>FS</i>	<i>OP</i>	<i>Ptot</i>
Accident and Emergency	0,55	0,6		0,9	2,05								
internal medicine		0,5			0,5								
surgery				0,1	0,1								
Total	0,55	1,1		1	2,65	1	1	0	2	12	8	4	26

Thesis

Haan, J de (2011, november 16). *Traumatic dislocation of the elbow joint*. EUR (194 pag.). Prom./coprom.: Prof. Dr. P. Patka & Dr. D. den Hartog.

Hartholt, K.A. (2011, september 21). *Falls and drugs in the older population: medical and societal consequences*. EUR. Prom./coprom.: Dr. T.J.M. van der Cammen & Prof. Dr. P. Patka.

Article/Letter to the editor

Burgers, P.T.P.W., Riel, M.P.J.M. van, Vogels, L.M.M., Stam, R., Patka, P. & Lieshout, E.M.M. van (2011). Rigidity of unilateral external fixators-A biomechanical study. *Injury-International Journal of the Care of the Injured*, 42(12), 1449-1454.

Folmer, W.H., Lammers, W.J., Mulligan, T., Lieshout, E.M.M. van, Patka, P., Xu, Z. & Lu, Y. (2011). Patient demographics in acute care surgery at the Ruijin Hospital, Shanghai. *ISRN Surgery*.

Haan, J de, Schep, N.W.L., Tuinebreijer, W.E., Patka, P. & Hartog, D. den (2011). Rasch analysis of the Dutch version of the Oxford elbow score. *Patient Related Outcome Measures*, 2, 145-149.

Haan, J de, Goei, H., Schep, N.W.L., Tuinebreijer, W.E., Patka, P. & Hartog, D. den (2011). The reliability, validity and responsiveness of the Dutch version of the Oxford elbow score. *Journal of Orthopaedic Surgery and Research*, 6(1).

Hartholt, K.A., Velde, N. van der, Lieshout, E.M.M. van, Polinder, S., Vries, O.J. de, Boye, N.D.A., Kerver, A.J.H., Ziere, G., Buijninckx, M.M., Vries, M.R. de, Mattace Raso, F.U.S., Uitterlinden, A.G., Beeck, E.F. van, Lips, P., Patka, P. & Cammen, T.J.M. van der (2011). [Cost]effectiveness of withdrawal of fall-risk increasing drugs versus conservative treatment in older fallers: design of a multicenter randomized controlled trial (IMPROVeFALL-study). *BMC Geriatrics*, 11(1), 48.

Hartholt, K.A., Stevens, J.A., Polinder, S., Cammen, T.J.M. van der & Patka, P. (2011). Increase in Fall-Related Hospitalizations in the United States, 2001-2008. *Journal of Trauma-Injury Infection and Critical Care*, 71(1), 255-258.

Hartholt, K.A., Lieshout, E.M.M. van, Polinder, S., Panneman, M.J.M., Cammen, T.J.M. van der & Patka, P. (2011). Rapid Increase in Hospitalizations Resulting from Fall-Related Traumatic Head Injury in Older Adults in the Netherlands 1986-2008. *Journal of Neurotrauma*, 28(5), 739-744.

Hartholt, K.A., Beeck, E.F. van, Polinder, S., Velde, N. van der, Lieshout, E.M.M. van, Panneman, M.J.M., Cammen, T.J.M. van der & Patka, P. (2011). Societal Consequences of Falls in the Older Population: Injuries, Healthcare Costs, and Long-Term Reduced Quality of Life. *Journal of Trauma-Injury Infection and Critical Care*, 71(3), 748-753.

Hartholt, K.A., Oudshoorn, C., Zielinski, S.M., Burgers, P.T.P.W., Panneman, M.J.M., Beeck, E.F. van, Patka, P. & Cammen, T.J.M. van der (2011). The Epidemic of Hip Fractures: Are We on the Right Track? *PLoS One*, 6(7).

Hartholt, K.A., Lieshout, E.M.M. van, Thies, W.C., Patka, P. & Schipper, I.B. (2011). Intraosseous devices: a randomized controlled trial comparing three intraosseous devices. *Nederlands Tijdschrift voor Traumatologie*, 19(1), 22.

Hartog, D. den, Tuinebreijer, W.E., Oprel, P. & Patka, P. (2011). Acute traumatic abdominal wall hernia. *Hernia*, 15(4), 443-445.

Hartog, D. den & Patka, P. (2011). Behandeling van proximale humerusfracturen bij volwassenen. *Nederlands Tijdschrift voor Heelkunde*, 20(4), 144-145.

Knops, S.P., Schep, N.W.L., Spoor, C.W., Riel, M.P.J.M. van, Spanjersberg, W.R., Kleinrensink, G.J., Lieshout, E.M.M. van, Patka, P. & Schipper, I.B. (2011). Comparison of Three Different Pelvic Circumferential Compression Devices: A Biomechanical Cadaver Study. *Journal of Bone and Joint Surgery-American Volume*, 93A(3), 230-240.

Knops, S.P., Lieshout, E.M.M. van, Spanjersberg, W.R., Patka, P. & Schipper, I.B. (2011). Randomised clinical trial comparing pressure characteristics of pelvic circumferential compression devices in healthy volunteers. *Injury-International Journal of the Care of the Injured*, 42(10), 1020-1026.

Knops, S.P., Patka, P., Schepers, T. & Lieshout, E.M.M. van (2011). Bekkenbanden voor acute stabilisatie van instabiele bekkenfracturen. *Nederlands Tijdschrift voor Traumatologie*, 19(5), 126-131.

Lammers, W.J., Folmer, W.H., Lieshout, E.M.M. van, Christiaanse, J.C., Hartog, D. den, Tong, J., Lu, Y. & Patka, P. (2011). Demographic analysis of emergency department patients at the Ruijin hospital Shanghai. *Emergency Medicine International*.

Lieshout, E.M.M. van, Kralingen, G.H. van, El-Massoudi, Y., Weinans, H.H. & Patka, P. (2011). Microstructure and biomechanical characteristics of bone substitutes for trauma and orthopaedic surgery. *BMC Musculoskeletal Disorders*, 12.

Ringburg, A.N., Polinder, S., Ierland, M.C.P. van, Steyerberg, E.W., Lieshout, E.M.M. van, Patka, P., Beeck, E.F. van & Schipper, I.B. (2011). Prevalence and Prognostic Factors of Disability After Major Trauma. *Journal of Trauma-Injury Infection and Critical Care*, 70(4), 916-922.

Ringburg, A.N., Polinder, S., Steyerberg, E.W., Lieshout, E.M.M. van, Patka, P., Beeck, E.F. van & Schipper, I.B. (2011). Voorspellende factoren van functionele beperkingen na ernstig letsel. *Nederlands Tijdschrift voor Geneeskunde*, 155(18).

Ringburg, A.N., Polinder, S., Steyerberg, E.W., Lieshout, E.M.M. van, Patka, P., Beeck, E.F. van & Schipper, I.B. (2011). Voorspellende factoren van functionele beperkingen na ernstig letsel. *Nederlands Tijdschrift voor Geneeskunde*, 155(18).

Schep, N.W.L., Haan, J de, Iordens, G.I.T., Tuinebreijer, W.E., Bronkhorst, M.W.G.A., Vries, M.R. de, Goslings, JC, Ham, SJ, Rhemrev, S, Roukema, GR, Schipper, I.B., Sintenie, JB, Meulen, HGWM Van der, Thiel, TPH Van, Vugt, A.B. van, Verleisdonk, EJMM, Vroemen, JPAM, Wittich, P, Patka, P., Lieshout, E.M.M. van & Hartog, D. den (2011). A hinged external fixator for complex elbow dislocations: A multicenter prospective cohort study. *BMC Musculoskeletal Disorders*, 12.

Schepers, T., Rooij, P.P. de, Lieshout, E.M.M. van & Patka, P. (2011). Reinsertion of an Inverted Osteochondral Lesion of the Talus: A Case Report. *Journal of Foot & Ankle Surgery*, 50(4), 486-489.

Spanjersberg, W.R., Knops, S.P., Schep, N.W.L., Lieshout, E.M.M. van, Patka, P. & Schipper, I.B. (2011). Effectiveness and complications of pelvic circumferential compression devices in patients with unstable pelvic fractures: a systematic review of literature. *Nederlands Tijdschrift voor Traumatologie*, 19(4), 116.

Stok, J. van der, Lieshout, E.M.M. van, El-Massoudi, Y., Kralingen, G.H. van & Patka, P. (2011). Bone substitutes in the Netherlands - A systematic literature review. *Acta Biomaterialia*, 7(2), 739-750.