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

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Thesis


Article/Letter to the editor


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.


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 extend 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 cardial stress for the purpose of patients with amputation, chronic pain, cardiac failure and the elderly.
4. The study of physical, social and psychological impairment and disability in adolescents and adults with (congenital) disorders in childhood

**Key Figures**

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**Thesis**


**Article/Letter to the editor**


Part of book - abstract


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 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

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Thesis


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


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 relief 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.

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