AMS research program 'Musculoskeletal Health'

As part of Amsterdam Movement Sciences (AMS), the research program Musculoskeletal Health (AMS-MSH ('P2')) conducts high-quality scientific research in the musculoskeletal system (muscles, bones, and tendons throughout the body), its relation with bio-psycho-social factors and its role in the onset or development of specific disorders. AMS-MSH research is primarily related to musculoskeletal disorders (for example within the field of orthopaedics, rheumatology, and physiotherapy). Still, also other disorders (for example within the field of neurology and oncology) that secondarily influence the musculoskeletal system fit within the scope of AMS-MSH.

AMS-MSH research is characterized by its translational character, as it links fundamental and applied research. By taking all relevant factors from the biological, psychological and social domain that possibly play a role in musculoskeletal health into account, AMS-MSH has a truly comprehensive bio-psycho-social perspective. AMS-MSH research covers the entire course of the disorder: from prevention to primary, secondary and even tertiary care, which includes conservative (e.g., physiotherapy, lifestyle), pharmaceutical, and surgical interventions. Innovations such as new diagnostic tests (e.g., inflammatory and epigenetic markers), new treatment approaches (e.g., e-Health, virtual reality) and new analysis techniques (e.g., machine or deep learning) are topics of interest. Finally, AMS-MSH strives for close collaboration with clinical partners, patients and private partners. For example, the Dutch Back Pain Consortium has been initiated to facilitate collaboration across knowledge institutes, patients, professionals and private companies in the field of back pain research.

AMS-MSH research themes

AMS-MSH research has been subdivided into the following five research themes. The selection of these themes has been made during a process of multiple board meetings and feedback from researchers of the AMS MSH program. An overview of current AMS-MSH projects within each research theme can be found here.

1. **Uncovering the pathophysiology of musculoskeletal disorders**
   What causes musculoskeletal disorders? What factors play a role in this? Within this theme, we do translational research in which we attempt to uncover the underlying pathophysiological mechanisms for the development or worsening of musculoskeletal disorders. These mechanisms can be generic or specific to one or a few conditions. Studies can be both fundamental (in laboratory) and applied/epidemiological.

2. **Predicting and understanding the course of musculoskeletal disorders**
   Why do musculoskeletal disorders lead to lasting disability in one person, while the other person is free of symptoms within weeks? Within this theme, studies focus on measuring the course of musculoskeletal disorders and resulting disabilities, and the mechanisms behind that. Valid, reliable and feasible measurement instruments to understand and, if possible, predict the course of musculoskeletal disorders are also investigated in this theme. Research within this theme contributes to a better understanding of the prognosis of musculoskeletal disorders.

3. **Developing and improving therapies for musculoskeletal disorders**
   What can be done to reduce symptoms and disabilities due to musculoskeletal disorders? Which treatments are effective in this regard, and how can they be applied in daily clinical practice?

Research in this theme focuses on the working mechanisms of therapies, developing, evaluating and/or implementing new or existing therapies for musculoskeletal disorders, based on established mechanisms and prognostic factors. These therapies can be given in first-, second- or third-line care, and can involve pharmaceutical, other conservative (such as physiotherapy), or surgical interventions. We also study if timely, effective care within primary care can prevent expensive, risky medical interventions to make care more efficient and save costs.

4. **Reducing societal impact of musculoskeletal disorders**
How can we ensure that someone with musculoskeletal disorders can continue to work and pursue activities of daily life that are important to them? Within this theme, we investigate the impact of musculoskeletal disorders on the patient's life (for example on work, sports, hobbies, and quality of life), based on established mechanisms and prognostic factors. In addition, we study the consequences that conditions have on society (such as medical costs and costs due to reduced work participation).

5. **Preventing musculoskeletal disorders**
Prevention is better than cure. In this theme, we assess whether musculoskeletal(-related) disorders can be prevented (i.e., primary prevention) or whether their impact can be mitigated (i.e., secondary prevention). We assess what mechanisms can be applied in prevention, with a central role for lifestyle and self-management.