Grants Awarded

Bath Institute for Rheumatic Diseases
Supporting arthritis research, education and patient engagement

Project Summary

Validation of 3D ultrasonography for the analysis of spinal load in Axial Spondyloarthritis

Dr Dario Cazzola - £4136.00

Rheumatic diseases result in restricted movement, pain, and significantly impact a patient's ability to perform everyday tasks. To slow down the progression of these diseases, patient's movement and joint stresses (i.e. joint forces) must be monitored with high accuracy and reliability. However, monitoring and assessing a patient's movement is difficult to perform non-invasively, with current methods relying on subjective scales that do not provide sufficient accuracy. Additionally, individual vertebral joint forces are difficult to examine as calculation of these forces requires complex participant-specific mathematical models which are more sensitive to stresses within the spine.

Three-dimensional (3D) ultrasound provides a cost effective, portable and radiation-free solution to image spinal vertebrae. This study will therefore validate the application of 3D ultrasound for the creation of subject-specific models against the gold standard MRI in five healthy volunteers. Accurate identification of joints forces may facilitate treatments targeted to reduce these stresses before they cause irreversible bone growth and movement loss. This technique will hopefully be one day applied in clinical routine patient treatment, allowing in-depth monitoring of changes in spinal movement. If validated, this method will impact the clinical analysis of several diseases beyond AS, such as scoliosis and broader spinal movement disorders.