

## Study Protocol August 31, 2018

### Pathophysiological Mechanism Behind Prolonged Whiplash Associated Disorders

#### Data analysis and statistics

For the RCT described elsewhere (ClinicalTrials.gov Protocol ID: NCT03022812).

Power calculation cannot be made for the pathophysiology data as the effect sizes are unknown after rehabilitation. Our earlier studies have shown that 30 individuals is enough for comparisons between individuals with health problems and healthy controls.

Ultrasound speckle tracking analyses (deformation and deformation rate) and inflammatory and stress biomarkers will be analysed with multivariate methods such as principal component analysis (PCA) and orthogonal partial least squares (OPLS). Additionally ultrasound data will be analyzed with mathematical mechanistic modeling that allows for a description of the different functions or mechanisms underlying the behavior of the muscles. Each mechanism is described by a mathematical equation and simulated over time. This allows us to compare the output of the model to the measured data and test if a specific hypothesis can explain the behavior of the data, as well as make predictions that can be used for diagnosis or planning experimental setup. MRI/fMRI data will be analyzed using parametric or non-parametric statistics depending on the type of data and whether the analysis is between groups or over time. Group comparisons from fMRI will be analyzed using SPM 8.