

This study uses functional magnetic resonance imaging (fMRI) to assess differences in brain activation patterns between individuals with and without low back pain. Participants in this study are performing a series of exercises common in low back pain rehabilitation programs while undergoing an fMRI. We are measuring the greatest activation in five sensorimotor regions of the brain (motor cortex, supplemental motor area, sensory cortex, secondary sensory cortex and the parietal operculum) and seeing how well these regions correlate to each other. We hypothesize that in the presence of pain, the correlation of activation between these regions will be decreased, whereas in asymptomatic individuals the correlation will be strong.

Additionally, this study seeks to assess the impact of spinal manipulation to the lumbar spine on the degree of correlation. Spinal manipulation is commonly utilized in the physical therapy clinic to address low back pain, yet the direct mechanisms behind its effectiveness remains largely unknown. We hypothesize that one of the mechanisms behind which spinal manipulation improves pain is through the restoration of the correlated activity within the difference sensorimotor regions. If this is true, then individuals who receive a manipulation will demonstrate greater correlated activity during exercise following the manipulation.

This study seeks to enroll a total of forty participants. These participants will be divided into four equal groups: 1) individuals with chronic low back pain (cLBP) who will receive a manipulation, 2) individuals with cLBP who will lay in sidelying for 5 minutes, 3) asymptomatic individuals who receive a manipulation, and 4) asymptomatic individuals who will lay in sidelying for five minutes. The participants will receive the first scan series, followed by their respective intervention (manipulation or sidelying), followed by a final scan series.