Neurocognitive Therapy, MRI Compatible Robot, and Brain Activity

**Figure 1:** Example of exercises performed in the Neurocognitive therapy

**Figure 2:** Example of exercises performed in the Neurocognitive therapy

**Figure 3:** Image of the robot and illustrations of the shapes that the robot makes with the finger in the air. In order to investigate proprioception while taking brain images in the MRI scanner, we developed an MRI compatible robot, which moves the index finger of the person, while making two shapes in the air that the person needs to distinguish from each other. As such it provides exercises to improve body awareness.

**Figure 4:** Brain activation in healthy subjects when performing exercises with robot

**Figure 5:** Comparison of brain activation in healthy subjects (controls) and stroke patients

**Figure 6:** Examples of exercises from the MESUPES. In order to evaluate recovery of function and quality of movement, we will ask you to do several movements with the arm and hand and score them. One of these lists of exercises is called the "Motor Evaluation Scale for Upper Extremity in Stroke Patients (MESUPES) and over 400 patients have been evaluated with this scale (2,7). This scale scores arm and hand movements, in a way that takes into account how much you move but also how well you move. If you cannot move the arm by yourself, this scale also takes into account how much you participate when the therapist helps you make the movement, or how your arm feels when the therapist moves your arm for you. We will also use sensors on the arm and hand with a machine called the "Motion Monitor" to adequately capture both range of movement as well as quality of movement.