**Stroke MRI Project**

**Experimental protocol**

**Participants:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Participant Group** | **Pre-intervention** | **Post-intervention** | **Follow-up** |
| Subcortical stroke   * Age > ? * MoCA > ? * … | 81  (64 for Gianna) | 81  (27+27+27) | 81  (27+27+27) |
| Cortical stroke   * Age > ? * MoCA > ? * … | As many as possible? | ? | ? |
| Matched healthy controls   * Age > ? * MoCA > ? * … | ? | ? | ? |
| Additional healthy young adults (for Bolton’s project)   * Age = 18-40 | ~30 |  |  |

**Scans:**

|  |  |  |
| --- | --- | --- |
| **Scans** | **Duration** | **Notes** |
| T1 | ~7 minutes |  |
| Field map | ~2 minutes |  |
| Resting-state | ~7 minutes |  |
| N back task | Trial duration:   * 2.5s instructions (0 back or 2 back) before each block * 2 runs of 8 task blocks (25s) and 4 fixation blocks (15s) * 10 trials per block   + 2s stimulus (and response)   + 0.5s ITI   Total duration:  [(2.5+25)\*8 + (15)\*4 ]\*2 =  ~9.5 minutes | “The category specific representation task and the working memory task are combined into a single task paradigm. Participants were presented with blocks of trials that consisted of pictures of places, tools, faces and body parts (non-mutilated parts of bodies with no “nudity”). Within each run, the 4 different stimulus types were presented in separate blocks. Also, within each run, ½ of the blocks use a 2-back working memory task and ½ use a 0-back working memory task (as a working memory comparison). A 2.5 second cue indicates the task type (and target for 0-back) at the start of the block. Each of the two runs contains 8 task blocks (10 trials of 2.5 seconds each, for 25 seconds) and 4 fixation blocks (15 seconds). On each trial, the stimulus is presented for 2 seconds, followed by a 500 ms inter-task interval (ITI).”  Task = 2 back  Control = 0 back |
| Stroop test | Trial duration:   * Total 80 trials (2 conditions with 2 levels)   + 5s stimulus (and response)   + 2s - 4s ITI (jitter)   Sum of jitter time: 238.6s  Total duration:  5s\*80 + 238.6s = ~10.7 minutes | Participants are presented with stimuli that consists of a color name on top and a color name at the bottom. They are asked whether the color of the word on top matches the meaning of the word at the bottom. In each trial, participants have 5 seconds to respond as soon as the stimulus is shown, followed by an inter-trial interval of 2 to 4 seconds. There are 2 conditions within this task. The first condition, congruency, describes whether the color and meaning of the word on top match. The second condition, match, describes whether the color of the word on top matches the meaning of the word at the bottom. There are 20 trials per level and condition. |
| Decision making | Each trial will consist of  (1) an inter-trial-interval (ranged from 1.3s to 1.9s);  (2) a fixation (ranged from 2s to 4s);  (3) a stimulus onset (<=4s);  (4) a response indication (ranged from 1.3s to 2.3s);  (5) a random drawing phase (ranged from 1.3s to 1.8s); and  (6) a reward delivery (ranged from 1.5s to 2s).  As a result, each trial will take approximately 10s. The complex choice task will involve 70 trials in total and it will take approximately 12 minutes to finish. | The complex choice task is a binary decision making task that requires the participants to choose between complex options or simple options. A simple option will be associated with a probabilistic reward. While a complex option will be a collection of twenty probabilistic rewards. |
| Clock test | ? | ? |
| Motor task |  |  |
| Dual task (N back task) |  |  |
| Dual task (Stroop test) |  |  |
| Dual task (Decision making) |  |  |
| Dual task (Clock test) |  |  |

**Total Duration:**? min

**Assessments outside scanner:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Duration** | **Purpose/Inclusion or Exclusion Criteria** | **Participant Group** |
| The Mini-Balance Evaluation Systems Test | Healthy:  5-10 min  Stroke:  10-15 min | * Balance; Mobility; Fall risk | Both |
| HK Version of Montreal Cognitive Assessment | 5-10 min | * Global cognitive | Both |
| Activities-specific Balance Confidence Scale | ~5 min | * Balance confidence | Both |
| Geriatric Depression Scales | ~5 min | * Depression | Both |
| Trail Making Test | 5-10 min | * Attention & Executive functions | Both |
| 10-meter walking test | 1-5 min | * Mobility | Both |
| Time Up and Go Test (\*missing from PDF) | ~5 min | * Balance; Mobility; Fall risk | Both |
| Fugl-Meyer Assessment (Lower Extremities) | 5-10 min | * Impairment index | Stroke |
| Functional Ambulance Classification | 1-3 min | * Ambulation ability | Stroke |
| Modified Rankin Scale | 1-3 min | * The degree of disability or dependence in the daily activities | Stroke |

**Total Duration:**Healthy: ~40 min  
Stroke: ~60 min

Ethics and research safety

* Stroke and matched healthy controls => Marco’s ethics, safety, UBSN project
* Additional healthy young adults => Bolton’s ethics, safety, UBSN project

**APPENDIX**

N back task instructions

