**Assessment of neuropsychological function in brain tumour treatment: A comparison of traditional neuropsychological assessment with app-based cognitive screening**

**Supplementary material**

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**Figure S1.** Distribution of z-scores for individual items across patients grouped by major domains (i.e., each count represents the score of one item in one of the patients’ assessment) Values less than 0 indicate items where brain tumour patients showed lower performance than healthy controls.

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**Table S1**. Individual cognitive tests included in the OCS-Bridge assessment and the traditional neuropsychology battery

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OCS-Bridge Assessment** | |  | **Neuropsychology Battery** | |
| **Oxford Cognitive Assessment** | |  | **Domain** | **Test** |
| **Domain** | **Test** |  | Verbal Memory | AMIPB Story – Immediate Recall |
| Attention | Hearts Accuracy |  | Verbal Memory | AMIPB Story – Delayed Recall |
| Attention | Space Neglect |  | Verbal Memory | BMIPB Word List - A1-A5 |
| Attention | Space Neglect |  | Verbal Memory | BMIPB Word List - A6 |
| Attention | Object Neglect |  | Verbal Memory | BMIPB Word List - Word recognition |
| Attention | Object Neglect |  | Verbal Memory | BMIPB Word List - List recognition |
| Attention | Perseveration |  | Nonverbal Memory | BMIPB Complex Figure – Immediate Recall |
| Attention | Hearts Organization Index |  | Nonverbal Memory | BMIPB Complex Figure – Delayed Recall |
| Perception | Visual PerceptionTotal |  | Nonverbal Memory | BMIPB Design Learning - A1-A5 |
| Perception | Visual Field |  | Nonverbal Memory | BMIPB Design Learning - A6 |
| Perception | Visual Field |  | Nonverbal Memory | BMIPB Design Learning - Design Recognition |
| Perception | Visual Extinction Left |  | Nonverbal Memory | BMIPB Design Learning - Design Identification |
| Perception | Visual Extinction Right |  | Verbal Skills | Test of Premorbid Functioning |
| Memory | Memory Free Verbal |  | Verbal Skills | Letter Fluency – FAS |
| Memory | Overall Verbal Memory |  | Verbal Skills | Semantic Fluency – Animals |
| Memory | Episodic Memory |  | Verbal Skills | Graded Naming Test |
| Memory | Orientation |  | Verbal Skills | Syntactic Speech Comprehension |
| Language | Picture Naming |  | Nonverbal skills | BMIPB Complex Figure copy |
| Language | Semantics |  | Nonverbal skills | VOSP Object Decision |
| Language | Sentence Reading Words Recalled |  | Nonverbal skills | VOSP Number Location |
| Praxis | Hand Positions |  | Nonverbal skills | VOSP Cube Analysis |
| Praxis | Finger Positions |  | Attention | WAIS-IV Digit Span - Forward |
| Praxis | Overall |  | Attention | WAIS-IV Digit Span - Backward |
| Number | Calculation |  | Executive Function | Initiation - Time |
| Number | Number Writing |  | Executive Function | Inhibition - Time |
|  |  |  | Executive Function | Inhibition - Score |
| **Cambridge Assessment** |  |  | Executive Function | Brixton |
| Perception | Boat Visual Acuity |  | Mood | Beck Anxiety Inventory |
| Perception | Line bisection |  | Mood | Beck Depression Inventory |
| Perception | Line bisection |  |  |  |
| Perception | Postcards object perception |  |  |  |
| Attention | SALT sustained attention |  |  |  |
| Attention | Target detection |  |  |  |
| Attention | Consistency of Attention |  |  |  |
| Attention | Target space bias |  |  |  |
| Attention | Target space bias |  |  |  |
| Attention | Reaction time space bias |  |  |  |
| Attention | Reaction time space bias |  |  |  |
| Verbal Working Memory | Forward Digit Span |  |  |  |
| Verbal Working Memory | Backwards Digit Span |  |  |  |
| Prospective Memory | Prospective Memory |  |  |  |
| Prospective Memory | Retrospective Memory |  |  |  |

**Table S2.** Combined domains across neuropsychological testing and OCS-Bridge testing.

|  |  |  |
| --- | --- | --- |
| **Combined Domain** | **Neuropsychology** | **OCS-Bridge** |
| Attention | Attention | Attention |
| Memory | Nonverbal Memory | Memory |
|  | Verbal Memory | Prospective Memory |
|  |  | Verbal Working Memory |
| Verbal Skills | Verbal Skills | Language |
| Nonverbal Skills | Nonverbal Skills | Praxis |
|  |  | Number |
|  |  | Perception |
| Executive Function | Executive Function | - |
| Mood | Mood | - |

**Table S3.** OCS-Bridge screening and neuropsychological assessments completed by each participant.



**Table S4.** Average total number of cognitive deficits and standard deviations across patients for each domain and assessment. A positive T value indicates a larger number of deficits detected by traditional neuropsychology compared with OCS-BRIDGE.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Neuropsychology  Average (SD) | OCS-BRIDGE  Average (SD) | *T* value | *P* value |
| Attention | Preoperative | 0.765 (0.83) | 0.353 (0.79) | 1.48 | 0.15 |
| Postoperative | 0.786 (0.70) | 0.500 (1.07) | 0.76 | 0.46 |
| Memory | Preoperative | 0.941 (1.20) | 0 (0) | 3.24 | **0.003** |
| Postoperative | 1.571 (1.70) | 0.125 (0.35) | 2.36 | **0.03** |
| Non-verbal skills | Preoperative | 0 (0) | 0.471 (0.62) | -3.11 | **0.004** |
| Postoperative | 0 (0) | 1.125 (1.36) | -3.16 | **0.005** |