**Supplemental Material S1.** Screening Test for Aphasia and Dysarthria (STAD) item difficulties.

|  |  |  |  |
| --- | --- | --- | --- |
| **STAD****Section** |  |  | **Correct frequency** |
| **Item** | **Instruction** | **n** | **%** |
| Verbalsection(16 items) | Patient name  | Please tell me your name. | 285  | 90.8  |
| Obey the command 1 | Please do what I say. Close your eyes. | 298  | 94.9  |
| Obey the command 2 | Touch your ear. | 285  | 90.8  |
| Obey the command 3 | Close and open your hand. | 276  | 87.9  |
| Word repetition 1 | Please repeat after me. *Umi* (sea)a. | 295  | 93.9  |
| Word repetition 2 | *Tamago* (egg) a. | 286  | 91.1  |
| Word repetition 3 | *Tebukuro* (globe) a. | 279  | 88.9  |
| Automatic speech | Please count to 10. | 279  | 88.9  |
| Object naming 1 | What is this? *Pen* (pen) a | 269  | 85.7  |
| Object naming 2 | *Haburashi* (tooth brush) a | 258  | 82.2  |
| Object naming 3 | *Taionkei* (thermometer) a | 248  | 79.0  |
| Name writing 1 | Please spell your name in Kanji. | 260  | 82.8  |
| Name writing 2 | Please spell your name in Kana. | 246  | 78.3  |
| Dictation 1 | Please write down what I say. *Tōmorokoshi* (corn)a | 212  | 67.5  |
| Dictation 2 | *Kurisumasutsurī* (christmas tree) a | 191  | 60.8  |
| Dictation 3 | *Inu mo arukeba bō ni ataru*b | 163  | 51.9  |
| Articulationsection(7 items) | Oral Movement 1 | Lick your upper lip. | 250  | 79.6  |
| Oral Movement 2 | Wiggle your tongue outside your mouth. | 254  | 80.9  |
| Oral Movement 3 | Move your tongue in and out. | 245  | 78.0  |
| Oral Movement 4 | Puff out your cheeks.  | 258  | 82.2  |
| Diadochokinesis 1 | Please copy me, papapa…(pʌ pʌ pʌ…) | 222  | 70.7  |
| Diadochokinesis 2 | tatata…(tʌ tʌ tʌ…) | 206  | 65.6  |
| Diadochokinesis 3 | kakaka…(kʌ kʌ kʌ…) | 174  | 55.4  |
| Non-VerbalSection(6 items) | Eye contact | Check based on the patient’s response. | 300  | 95.5  |
| Orientation | What is today's date? | 242  | 77.1  |
| Imitation 1 | Do as I do, please (make a "peace sign": I, IV V ring). | 292  | 93.0  |
| Imitation 2 | (stand index/little finger " I, III, IV ring) | 223  | 71.0  |
| Visual construction 1 | Please copy this figure. (凹) | 234  | 74.5  |
| Visual construction 2 | (cube) | 167  | 53.2  |
| Note. aThe initial capital letter represents Japanese. A lowercase letter in parentheses indicates the authors' direct translation from the original Japanese. bJapanese proverb.  |

**Supplemental Material S2.** Impact of aphasia on the effectiveness of each STAD item

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Aphasia** |  | **Evaluated value** |
|  |  | **Present (n = 92)** |  | **Absent (n = 222)** |  | **Odds****ratio** | **Effect****Size** | ***p*** |
| **STAD****Section** | **Items** | **Correct****(n)** | **Wrong****(n)** |  | **Correct****(n)** | **Wrong****(n)** |  |
| VerbalSection(16 items) | Patient name | 65 | 27 |  | 220 | 2 |  | 45.7  | 0.45  | <0.0001 |
| Obey command 1 | 80 | 12 |  | 218 | 4 |  | 8.2  | 0.23  | 0.0001  |
| Obey command 2 | 69 | 23 |  | 216 | 6 |  | 12.0  | 0.35  | <0.0001 |
| Obey command 3 | 63 | 29 |  | 213 | 9 |  | 10.9  | 0.38  | <0.0001 |
| Repetition 1 | 75 | 17 |  | 220 | 2 |  | 24.9  | 0.34  | <0.0001 |
| Repetition 2 | 66 | 26 |  | 220 | 2 |  | 43.3  | 0.44  | <0.0001 |
| Repetition 3 | 63 | 29 |  | 216 | 6 |  | 16.6  | 0.42  | <0.0001 |
| Automatic speech | 65 | 27 |  | 214 | 8 |  | 11.1  | 0.37  | <0.0001 |
| Object naming 1 | 55 | 37 |  | 214 | 8 |  | 18.0  | 0.48  | <0.0001 |
| Object naming 2 | 41 | 51 |  | 217 | 5 |  | 54.0  | 0.63  | <0.0001 |
| Object naming 3 | 38 | 54 |  | 210 | 12 |  | 24.9  | 0.60  | <0.0001 |
| Name writing 1 | 55 | 37 |  | 205 | 17 |  | 8.1  | 0.39  | <0.0001 |
| Name writing 2 | 41 | 51 |  | 205 | 17 |  | 15.0  | 0.53  | <0.0001 |
| Dictation 1 | 25 | 67 |  | 187 | 35 |  | 14.3  | 0.55  | <0.0001 |
| Dictation 2 | 15 | 77 |  | 176 | 46 |  | 19.6  | 0.59  | <0.0001 |
| Dictation 3 | 12 | 80 |  | 151 | 71 |  | 14.2  | 0.50  | <0.0001 |
| ArticulationSection(7 items) | Oral movement 1 | 67 | 25 |  | 183 | 39 |  | 1.8  | 0.11  | 0.0648  |
| Oral movement 2 | 65 | 27 |  | 189 | 33 |  | 2.4  | 0.17  | 0.0043  |
| Oral movement 3 | 68 | 24 |  | 177 | 45 |  | 1.4  | 0.06  | 0.2948  |
| Oral movement 4 | 68 | 24 |  | 190 | 32 |  | 2.1  | 0.14  | 0.0225  |
| Diadochokinesis 1 | 62 | 30 |  | 160 | 62 |  | 1.2  | 0.05  | 0.4164  |
| Diadochokinesis 2 | 56 | 36 |  | 150 | 72 |  | 1.3  | 0.06  | 0.2965  |
| Diadochokinesis 3 | 49 | 43 |  | 125 | 97 |  | 1.1  | 0.03  | 0.6207  |
| Non-VerbalSection(6 items) | Eye contact | 83 | 9 |  | 217 | 5 |  | 4.7  | 0.17  | 0.0059  |
| Orientation | 59 | 33 |  | 183 | 39 |  | 2.6  | 0.20  | 0.0007  |
| Imitation 1 | 77 | 15 |  | 215 | 7 |  | 6.0  | 0.23  | 0.0001  |
| Imitation 2 | 50 | 42 |  | 173 | 49 |  | 3.0  | 0.24  | 0.0001  |
| Construction 1 | 63 | 29 |  | 171 | 51 |  | 1.5  | 0.09  | 0.1196  |
| Construction 2 | 41 | 51 |  | 126 | 96 |  | 1.6  | 0.11  | 0.0621  |
| Note. The table represents the number of patients from binary data of item that are either correct or wrong with 2 aphasia factors of either present or absent. Effect size and *p*-value for each STAD items were calculated using *phi* coefficient and Fisher's Exact Test of Count Data. The effect size value is used in Figure 2. |

**Supplemental Material S3.** Impact of dysarthria on the effectiveness of each STAD item

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Dysarthria** |  | **Evaluated value** |
|  |  | **Present (n = 154)** |  | **Absent (n = 160)** |  | **Odds****Ratio** | **Effect****Size** | ***p*** |
| **STAD****Section** | **Items** | **Correct****(n)** | **Wrong****(n)** |  | **Correct****(n)** | **Wrong****(n)** |  |
| VerbalSection(16 items) | Patient name | 141  | 13  |  | 144  | 16  |  | 0.8  | 0.03  | 0.3896  |
| Obey command 1 | 146  | 8  |  | 152  | 8  |  | 1.0  | 0.00  | 0.9375  |
| Obey command 2 | 140  | 14  |  | 145  | 15  |  | 1.0  | 0.00  | 0.9307  |
| Obey command 3 | 137  | 17  |  | 139  | 21  |  | 0.8  | 0.03  | 0.6070  |
| Repetition 1 | 145  | 9  |  | 150  | 10  |  | 0.9  | 0.01  | 0.8801  |
| Repetition 2 | 141  | 13  |  | 145  | 15  |  | 0.9  | 0.02  | 0.8443  |
| Repetition 3 | 138  | 16  |  | 141  | 19  |  | 0.9  | 0.02  | 0.7223  |
| Automatic speech | 135  | 19  |  | 144  | 16  |  | 1.3  | 0.04  | 0.5917  |
| Object naming 1 | 135  | 19  |  | 134  | 26  |  | 0.7  | 0.06  | 0.3386  |
| Object naming 2 | 129  | 25  |  | 128  | 32  |  | 0.8  | 0.05  | 0.4643  |
| Object naming 3 | 124  | 30  |  | 124  | 36  |  | 0.8  | 0.04  | 0.5800  |
| Name writing 1 | 122  | 32  |  | 138  | 22  |  | 1.6  | 0.09  | 0.1028  |
| Name writing 2 | 119  | 35  |  | 127  | 33  |  | 1.1  | 0.03  | 0.6825  |
| Dictation 1 | 98  | 56  |  | 114  | 46  |  | 1.4  | 0.08  | 0.1848  |
| Dictation 2 | 90  | 64  |  | 101  | 59  |  | 1.2  | 0.05  | 0.4196  |
| Dictation 3 | 81  | 73  |  | 82  | 78  |  | 0.9  | 0.01  | 0.8222  |
| ArticulationSection(7 items) | Oral movement 1 | 105  | 49  |  | 145  | 15  |  | 4.5  | 0.28  | <0.0001 |
| Oral movement 2 | 107  | 47  |  | 147  | 13  |  | 5.0  | 0.28  | <0.0001 |
| Oral movement 3 | 97  | 57  |  | 148  | 12  |  | 7.2  | 0.36  | <0.0001 |
| Oral movement 4 | 114  | 40  |  | 144  | 16  |  | 3.2  | 0.21  | 0.0002  |
| Diadochokinesis 1 | 76  | 78  |  | 146  | 14  |  | 10.7  | 0.46  | <0.0001 |
| Diadochokinesis 2 | 63  | 91  |  | 143  | 17  |  | 12.2  | 0.51  | <0.0001 |
| Diadochokinesis 3 | 35  | 119  |  | 139  | 21  |  | 22.5  | 0.65  | <0.0001 |
| Non-VerbalSection(6 items) | Eye contact | 149  | 5  |  | 151  | 9  |  | 0.6  | 0.06  | 0.4144  |
| Orientation | 122  | 32  |  | 120  | 40  |  | 0.8  | 0.05  | 0.4212  |
| Imitation 1 | 144  | 10  |  | 148  | 12  |  | 0.9  | 0.02  | 0.8263  |
| Imitation 2 | 104  | 50  |  | 119  | 41  |  | 1.4  | 0.08  | 0.2136  |
| Construction 1 | 102  | 52  |  | 132  | 28  |  | 2.4  | 0.19  | 0.0011  |
| Construction 2 | 74  | 80  |  | 93  | 67  |  | 1.5  | 0.10  | 0.0897  |
| Note. The table represents the number of patients from binary data of item that either correct or wrong with 2 dysarthria factors of either present or absent. Effect size and *p*-value for each STAD items were calculated using *phi* coefficient and Fisher's Exact Test of Count Data. The effect size value is used in Figure 2. |

**Supplemental Material S4.** Impact of cognitive dysfunction on the effectiveness of each STAD item

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Cognitive dysfunction** |  | **Evaluated value** |
|  |  | **Present (n = 179)** |  | **Absent (n = 135)** |  | **Odds****Ratio** | **Effect****Size** | ***P*** |
| **STAD****Section** | **Items** | **Correct****(n)** | **Wrong****(n)** |  | **Correct****(n)** | **Wrong****(n)** |  |
| VerbalSection(16 items) | Patient name | 156  | 23  |  | 129  | 6  |  | 3.2  | 0.14  | 0.0107  |
| Obey command 1 | 163  | 16  |  | 135  | 0  |  | Infinite | 0.20  | 0.0001  |
| Obey command 2 | 154  | 25  |  | 131  | 4  |  | 5.3  | 0.19  | 0.0007  |
| Obey command 3 | 146  | 33  |  | 130  | 5  |  | 5.9  | 0.22  | <0.0001 |
| Repetition 1 | 164  | 15  |  | 131  | 4  |  | 3.0  | 0.11  | 0.0560  |
| Repetition 2 | 158  | 21  |  | 128  | 7  |  | 2.4  | 0.11  | 0.0473  |
| Repetition 3 | 156  | 23  |  | 123  | 12  |  | 1.5  | 0.06  | 0.2844  |
| Automatic speech | 148  | 31  |  | 131  | 4  |  | 6.9  | 0.23  | <0.0001 |
| Object naming 1 | 147  | 32  |  | 122  | 13  |  | 2.0  | 0.12  | 0.0502  |
| Object naming 2 | 139  | 40  |  | 119  | 16  |  | 2.1  | 0.14  | 0.0174  |
| Object naming 3 | 128  | 51  |  | 120  | 15  |  | 3.2  | 0.21  | 0.0002  |
| Name writing 1 | 132  | 47  |  | 128  | 7  |  | 6.5  | 0.28  | <0.0001 |
| Name writing 2 | 123  | 56  |  | 123  | 12  |  | 4.7  | 0.27  | <0.0001 |
| Dictation 1 | 98  | 81  |  | 114  | 21  |  | 4.5  | 0.31  | <0.0001 |
| Dictation 2 | 81  | 98  |  | 110  | 25  |  | 5.3  | 0.37  | <0.0001 |
| Dictation 3 | 66  | 113  |  | 97  | 38  |  | 4.4  | 0.35  | <0.0001 |
| ArticulationSection(7 items) | Oral movement 1 | 133  | 46  |  | 117  | 18  |  | 2.2  | 0.15  | 0.0073  |
| Oral movement 2 | 137  | 42  |  | 117  | 18  |  | 2.0  | 0.13  | 0.0293  |
| Oral movement 3 | 131  | 48  |  | 114  | 21  |  | 2.0  | 0.13  | 0.0193  |
| Oral movement 4 | 137  | 42  |  | 121  | 14  |  | 2.6  | 0.17  | 0.0025  |
| Diadochokinesis 1 | 121  | 58  |  | 101  | 34  |  | 1.4  | 0.08  | 0.1709  |
| Diadochokinesis 2 | 108  | 71  |  | 98  | 37  |  | 1.7  | 0.13  | 0.0306  |
| Diadochokinesis 3 | 86  | 93  |  | 88  | 47  |  | 2.0  | 0.17  | 0.0029  |
| Non-VerbalSection(6 items) | Eye contact | 165  | 14  |  | 135  | 0  |  | Infinite | 0.19  | 0.0004  |
| Orientation | 110  | 69  |  | 132  | 3  |  | 27.6  | 0.43  | <0.0001 |
| Imitation 1 | 157  | 22  |  | 135  | 0  |  | Infinite | 0.24  | <0.0001 |
| Imitation 2 | 94  | 85  |  | 129  | 6  |  | 19.4  | 0.47  | <0.0001 |
| Construction 1 | 104  | 75  |  | 130  | 5  |  | 18.8  | 0.43  | <0.0001 |
| Construction 2 | 54  | 125  |  | 113  | 22  |  | 11.9  | 0.53  | <0.0001 |
| Note. The table counts the number of patients from binary data of item correct or wrong with 2 factors of Cognitive dysfunction present or absent. Effect size and *p*-value for each STAD items were calculated by *phi* coefficient and Fisher's Exact Test of Count Data. The effect size value is being used in Figure 2. of the manuscript.  |

**Supplemental Material S5.** Means (and standard deviations) for reference measures.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Reference****measure** | ***n*** | **Max****possible****score** | **Male** | **Female** | **Total** | **Range** |
|  |  |  |  |  |  |  |
| WAB AQ | 57 | 100 | 56.37  | 55.86  | 57.09  | 0–99.8 |
|  |  |  | (29.74) | (31.81) | (30.33) |  |
|  |  |  |  |  |  |  |
| AMSD | 84 | 29 | 17.98  | 18.21  | 18.09  | 0–28 |
|  |  |  | (7.61) | (7.48) | (7.51) |  |
|  |  |  |  |  |  |  |
| WAB NLS | 71 | 10 | 6.57  | 5.48  | 6.19  | 0–9.75 |
|  |  |  | (2.50) | (2.70) | (2.61) |  |
|  |  |  |  |  |  |  |
| ***Note.*** WAB AQ = Western Aphasia Battery Aphasia quotient (Kertesz 1982; Sugishita 1986); AMSD = Assessment of Motor Speech for dysarthria (Nishio 2004); WAB NLS = Western Aphasia Battery Non-Linguistic Skills (Kertesz 1982; Sugishita 1986). |

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