**Supplemental Table S1**

Psychometric information about the Zurich Neuromotor Assessment

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ZNA Components** | **Description** | **Intrarater Reliability** | **Interrater Reliability** | **Test-retest Reliability** |
| Pure motor function | - repetitive foot: 20 taps of the forefoot while the heel remains on the floor.  - repetitive hand: 20 pattings of one hand with the wrist resting on the thighs.  - repetitive finger: 20 taps between thumb and index finger while arms are held up sideways.  - alternating foot: 10 pairs of heel–toe alternations, with one part of the foot being always on the floor.  - alternating hand: 10 pairs of alternating supination–pronation movements of one hand with the wrist resting on the thigh.  - sequential finger: five sequences of finger-thumb opposition per hand | 0.94 | 0.92 | 0.91 |
| Adaptive fine motor | 14 plastic pegs are placed in holes one at a time, first with the dominant then with the non-dominant hand. | 0.99 | 0.97 | 0.77 |
| Adaptive gross motor | The first trial consists of 10 jumps back and forth over the cord sideways while keeping the feet together and the second trial was forward jumping: to jump sideways over the cord six times while moving forward to the one pole and then returning with six jumps to the first pole. | 1.00 | 0.90 | 0.86 |
| Static balance | Involves standing on one foot for as long as possible holding a stick over the head. | 1.00 | 0.98 | 0.57 |
| Associated movements | Duration and degree of contralateral associated movements is scored. | 0.82 | 0.75 | 0.66 |

Note: Apart from dynamic balance each task is performed with both the dominant and the non-dominant side. ZNA, Zurich Neuromotor Assessment

**Supplemental Table S2**

Correlations between the motor, visuomotor and behavioral outcomes in children with complex CHD

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Z-1 | Z-2 | Z-3 | Z-4 | CAMs | Beery Visuo-  Motor-  Integration | Beery  Visual  Perception | Beery  Motor  Coordination | | SDQ  Total Score | SDQ Internalizing Subscales | SDQ Externalizing Subscales |
| Z-1 | 1 |  |  |  |  |  |  | |  |  |  |  |
| Z-2 | **0.46\*\*\*** | 1 |  |  |  |  |  | |  |  |  |  |
| Z-3 | **0.32\*\*\*** | **0.41\*\*\*** | 1 |  |  |  |  | |  |  |  |  |
| Z-4 | **0.33\*\*\*** | **0.53\*\*\*** | **0.38\*\*\*** | 1 |  |  |  | |  |  |  |  |
| CAMs | **0.34\*** | **0.33\*\*\*** | 0.10 | 0.11 | 1 |  |  | |  |  |  |  |
| Beery Visuo-  Motor-Integration | **0.43\*\*\*** | **0.33\*\*\*** | **0.24\*\*** | **0.43\*\*\*** | 0.10 | 1 |  | |  |  |  |  |
| Beery Visual Perception | **0.39\*\*\*** | **0.30\*\*\*** | **0.22\*** | **0.39\*\*\*** | 0.12 | **0.59\*\*\*** | 1 | |  |  |  |  |
| Beery Motor Coordination | **0.47\*\*\*** | **0.46\*\*\*** | **0.33\*\*\*** | **0.45\*\*\*** | 0.11 | **0.59\*\*\*** | **0.35\*\*\*** | | 1 |  |  |  |
| SDQ Total Score | **-0.21\*** | **-0.28\*\*** | **-0.23\*** | **-0.37\*\*\*** | -0.15 | **-0.39\*\*\*** | **-0.37\*\*\*** | | **-0.29\*\*** | 1 |  |  |
| SDQ Internalizing Subscales | **-0.20\*** | **-0.26\*\*** | **-0.28\*\*** | **-0.29\*\*\*** | **-0.22\*** | **-0.33\*\*\*** | **-0.32\*\*\*** | | **-0.24\*** | **0.84\*\*\*** | 1 |  |
| SDQ Externalizing Subscales | -0.16 | -0.23 | -0.13 | **-0.32\*\*\*** | -0.06 | **-0.33\*\*\*** | **-0.32\*\*\*** | | **-0.29\*\*** | **0.89\*\*\*** | **0.52\*\*\*** | 1 |

*Note*: Figures in **bold** are statistically significant correlations, **\*** *p* ≤ 0.05, **\*\*** *p* ≤ 0.01, **\*\*\*** *p* ≤ 0.001

Z-1, pure motor; Z-2, adaptive fine motor; Z-3, adaptive gross motor; Z-4, static balance; CAMs, contralateral associated movements; SDQ, Strengths and Difficulties Questionnaire

**Supplemental Table S3**

Risk factor analysis for motor outcome in children with complex CHD

|  |  |  |  |
| --- | --- | --- | --- |
| **Dependent variable** | **Independent variable** | **β** | ***p*-value** |
| Pure motor \* | Socioeconomic status  Gestational age  Birth weight (z-score)  Univentricular CHD  Mean preoperative saturation  Age at first CPB surgery  Lowest intraoperative temperature  ECC time during the first surgery Length of hospitalization | 0.07  0.15  0.20  -0.04  0.10  -0.03  -0.14  -0.18  -0.22 | 0.428  0.119  **0.038**  0.642  0.301  0.718  0.195  0.083  **0.038** |
| Adaptive fine motor \*\* | Socioeconomic status  Gestational age  Birth weight (z-score)  Univentricular CHD  Mean preoperative saturation  Age at first CPB surgery  Lowest intraoperative temperature  ECC time during the first surgery Length of hospitalization | 0.03  0.19  0.07  0.04  0.11  0.00  -0.08  -0.23  -0.10 | 0.712  **0.046**  0.508  0.663  0.275  0.978  0.455  **0.035**  0.353 |
| Adaptive gross motor \*\*\* | Socioeconomic status  Gestational age  Birth weight (z-score)  Univentricular CHD  Mean preoperative saturation  Age at first CPB surgery  Lowest intraoperative temperature  ECC time during the first surgery Length of hospitalization | 0.02  0.18  -0.13  -0.10  0.10  -0.05  -0.02  0.04  -0.11 | 0.823  0.077  0.230  0.340  0.345  0.660  0.883  0.760  0.353 |
| Static balance\*\*\*\* | Socioeconomic status  Gestational age  Birth weight (z-score)  Univentricular CHD  Mean preoperative saturation  Age at first CPB surgery  Lowest intraoperative temperature  ECC time during the first surgery Length of hospitalization | 0.18  0.10  -0.02  0.06  -0.04  -0.10  -0.04  0.02  -0.31 | 0.055  0.301  0.838  0.533  0.672  0.336  0.729  0.881  **0.004** |
| Contralateral Associated movements\*\*\*\*\* | Socioeconomic status  Gestational age  Birth weight (z-score)  Univentricular CHD  Mean preoperative saturation  Age at first CPB surgery  Lowest intraoperative temperature  ECC time during the first surgery Length of hospitalization | 0.05  0.10  0.17  -0.01  0.04  0.07  -0.02  -0.29  0.19 | 0.675  0.392  0.196  0.963  0.735  0.540  0.911  **0.025**  0.160 |

CPB, cardiopulmonary bypass surgery. \* Adjusted R2: 0.15, ANOVA sig. *p* = **0.002**, \*\* Adjusted R2: 0.08, ANOVA sig. *p* = **0.040**, \*\*\* Adjusted R2: 0.01, ANOVA sig. *p* = 0.324, \*\*\*\* Adjusted R2: 0.06, ANOVA sig. *p* = 0.079 \*\*\*\*\* Adjusted R2: 0.03, ANOVA sig. *p* = 0.265