**Supplementary Information**

Based on our data, corrected left and right hippocampal ratios less than 0.0023 have greater than 90% specificity and 40% sensitivity for low Bayley III cognitive composite scores (defined as scores <85) at age 2 years across all groups. Further, absolute left and right hippocampal volumes ≤9.0 mm3 have >88% specificity with sensitivity of 37% and 35%, respectively, for Bayley-III cognitive composite scores <85 across all groups. When subdivided into FT, VPT and BI groups, comparable results are obtained for each group using corrected hippocampal volume cutoffs of 0.0027, 0.0025 and 0.0022, respectively. This constellation of findings suggests this measure is a specific but not sensitive indicator of early cognitive outcomes.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 1. Uncorrected Hippocampal Volumes** | | | | | | | | | | | |
|  | **FT**  **n=55** | **VPT n=85** | **BI n=73** | **df** | **** | **p** | **Male n=112** | **Female**  **n=101** | **df** | **** | **p** |
| **Left raw HC vol (mm3)** | 10.97 | 10.06 | 9.12 | 211 | -.48 | <0.001\* | 9.98 | 9.96 | 211 | -.05 | 0.40 |
| **Right raw HC vol (mm3)** | 11.35 | 10.28 | 9.28 | 211 | -.52 | <0.001\* | 10.22 | 10.21 | 211 | -.05 | 0.40 |
| **Intracranial volume (mm3)** | 413.7 | 399.4 | 422.6 | 211 | F = 3.19 | 0.043\* | 425.2 | 393.4 | 211 | F = 3.81 | <0.001\* |
|  | **IVH n=33** | **PHH n=27** | **cPVL n=13** | **df** | **F** | **p** |
| **Left raw HC vol (mm3)** | 10.02 | 7.80 | 9.09 | 72 | 23.3 | <0.001\* |
| **Right raw HC vol (mm3)** | 10.34 | 8.10 | 9.03 | 72 | 21.8 | <0.001\* |
| **Intracranial volume (mm3)** | 428.6 | 432.3 | 386.9 | 72 | 2.6 | 0.081 |

-coefficients derived from stepwise linear regression models with F statistics derived from ANOVA. Uncorrected hippocampal volumes were measured as described in the Methods, using MANTiS segmentation followed by manual tracing.

\* indicates < 0.05

**Supplementary Table 2. Correlation between cHC and FOHR Across Groups**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **FT**  **(n=55)** | **VPT**  **(n=85)** | **BI**  **(n= 73)** | **IVH**  **(n =33)** | **PHH**  **(n=27)** | **cPVL**  **(n=13)** |
| **Left** | -0.15 | -0.28\* | -0.72\*\* | -0.69\*\* | -0.42^ | -0.45 |
| **Right** | -0.18 | -0.35\*\* | -0.71\*\* | -0.33 | -0.65\*\* | -0.34 |

Pearson’s r values between left and right cHC and FOHR

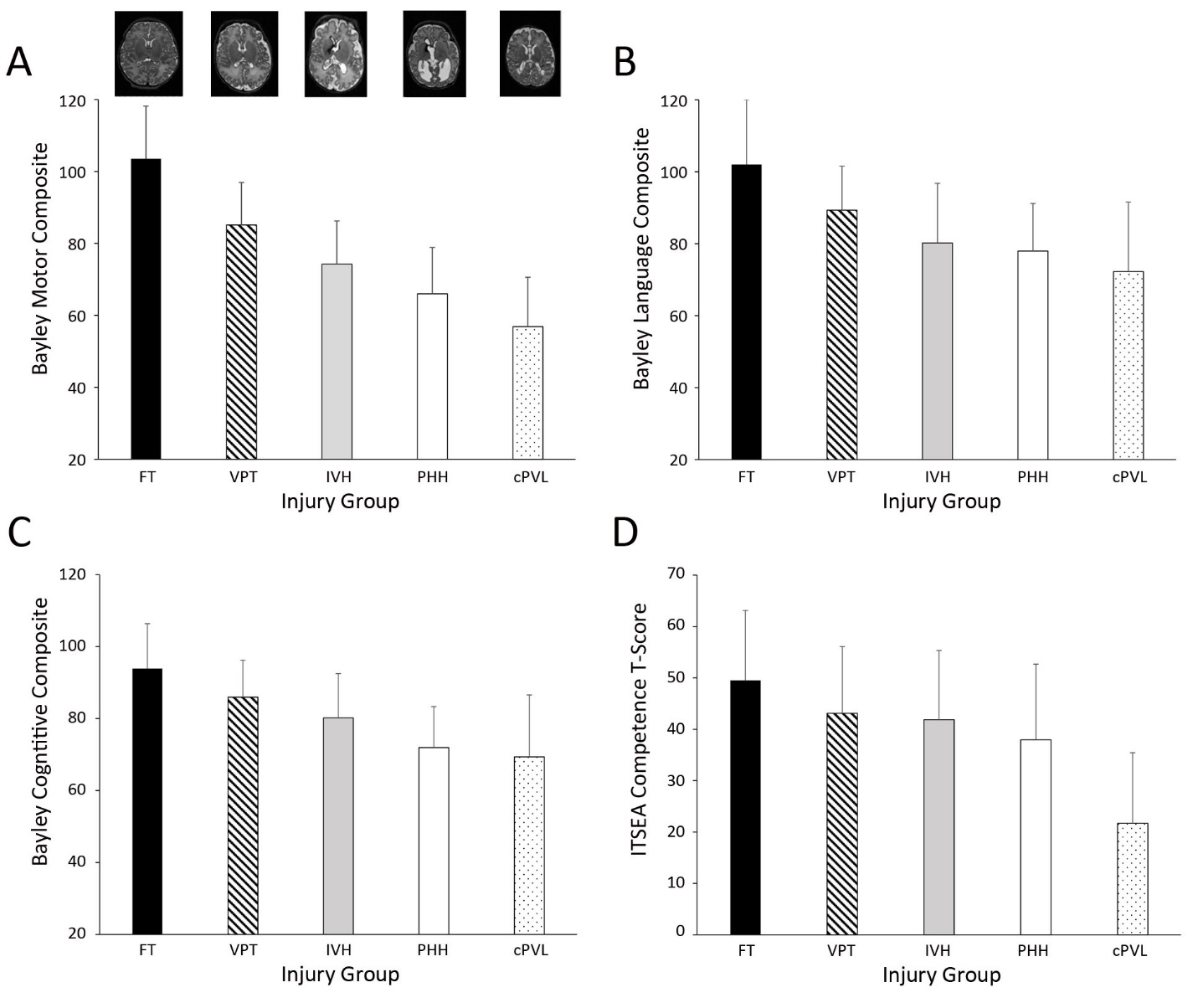
cHC = corrected hippocampal volume (ratio), calculated by dividing hippocampal volumes by the intracranial volume (ICV), as described in the Methods.

FOHR = fronto-occipital horn ratio

^= p<0.05

\*= p<0.01

\*\*= p≤0.001

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**Supplementary Figure 1. Neurodevelopmental outcomes across groups.** Plots demonstrating neurodevelopmental outcomes across domains for each infant category,including full-term infants (FT), very preterm infants without brain injury (VPT), very preterm infants with grade III/IV IVH (IVH), very preterm infants with IVH and post-hemorrhagic hydrocephalus requiring neurosurgical intervention (PHH) and very preterm infants with cystic periventricular leukomalacia (cPVL). Results for **A)** Bayley Scales of Infant Development, 3rd edition (Bayley-III) composite motor score, **B)** Bayley-III composite language score, **C)** Bayley-III composite cognitive score and **D)** ITSEA competence score included. Error bars represent one standard deviation.