Detecting cognitive impairment in pediatric neurology patients using the CNS Vital Signs computerized neuropsychological battery

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### RESULTS

Demographic information is presented in Table 1. There were significant differences between the healthy control and neurology groups for age \(t(445)=0.82, p= .41\), sex \(\chi^2(1) = 2.54, p = .11\) or race \(\chi^2(1) = 3.59, p = .058\); when dichotomized as Caucasian versus other. There was a significant difference in handedness \(\chi^2(1) = 5.94, p = .015\).

Performance on the CNS Vital Signs domain (index) scores is presented in Table 2. The neurology group had worse overall cognition on the summary score (i.e., Neurocognition Index), with a Cohen’s \(d\) effect size of \(d=1.08\).

On the domain scores, the pediatric neurology group had significantly worse performance with verbal memory, visual memory, psychomotor speed, reaction time, complex attention, and cognitive flexibility.

The base rates of low scores, are presented in Table 3. Two or more scores \(5^{th}\) percentile is found in 3.4% of healthy control children and in 36.6% of neurology patients.

### METHODS

Participants included 166 children and adolescents (ages 7-19 years) who were consecutive referrals for neuropsychological assessments. The 281 healthy children and adolescents (7-19 years) included in this study were derived from the CNS Vital Signs normative database.

CNS Vital Signs is composed of seven neuropsychological measures:
- Verbal Memory
- Visual Memory
- Finger Tapping
- Symbol Digit Coding
- Stroop Test
- Shifting Attention Test
- Continuous Performance Test

These measures yield an overall score, the Neurocognition Index, and five primary domain scores:
- Memory (verbal and visual)
- Psychomotor Speed
- Reaction Time
- Cognitive Flexibility
- Complex Attention

### DISCUSSION

To our knowledge, this is the first study to demonstrate the utility of the CNS Vital Signs in a large sample of pediatric neurology patients.

In this heterogeneous pediatric neurology sample, significantly worse performance was found for all domain scores and for the majority of subtest scores. The information on the base rates of low scores (Table 3) provides a preliminary method for quickly identifying whether a patient’s cognitive profile is uncommon in healthy children and adolescents.

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