Behavior After TBI in Children Who Require Brief Hospitalization
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INTRODUCTION
- Estimated annual incidence of TBI in children under 15 years of age in the United States is 180 per 100,000
- Studies have demonstrated that children have significant unmet healthcare needs following TBI, particularly those with less severe TBIs
- Research suggests that cognitive/mental health needs are frequently unmet after pediatric TBI
- Children who are briefly hospitalized after TBI are often discharged without routine neuropsychological follow-up
- Studies have shown that executive function skills, most notably working memory, are negatively impacted by TBI
- Pre-injury mood and behavioral diagnoses have been associated with increased risk of psychiatric difficulties following TBI

METHODS
- Information regarding Glasgow Coma Scale ratings (GCS), loss of consciousness (LOC), and neuroimaging findings obtained from review of available medical records
- Pre-injury diagnoses (LD, ADHD, mood, and behavioral diagnoses) obtained from parent report
- Behavior Rating Inventory of Executive Function (BRIEF) parent ratings used to assess pre- and post-injury executive functioning
- Behavior Assessment Scale for Children – 2nd Edition (BASC-2) parent ratings used to assess pre- and post-injury emotional/behavioral functioning

Participants
- 100 children and adolescents requiring overnight hospitalization following injury to the head
- Mean age = 10.6 years
- 70% male
- Mean days post-injury = 37

Medical Factors
- Inpatient days range 1-16, mode = 2
- 37 participants with available GCS ratings
  - Range 3-15
    - TBI Classification: 25 Mild, 1 Moderate, 11 Severe
  - 63% experienced LOC
  - 61% positive findings on neuroimaging

Pre-Injury Diagnoses
- 14% learning disabilities
- 15% ADHD
- 31% behavioral problems
- 21% mood problems

RESULTS
- GCS, LOC, or imaging (CT or MRI) findings were not significantly associated with post-injury parent BRIEF or BASC-2 ratings
- BRIEF
  - 28% of participants had elevated BRIEF scores post-injury
  - Working Memory scale most commonly elevated (31%)
  - Parent ratings suggested a significant increase in executive dysfunction from pre- to post-injury based on the BRIEF (See Figure 1)

- BASC-2
  - Only 4% were rated as having clinically significant behavioral problems on the BASC-2 post-injury but parent ratings suggested a significant increase in symptoms from pre- to post-injury (See Figure 2)

CONCLUSIONS
- This study supports the need for more consistent neuropsychological follow-up after pediatric TBI, even for those who are discharged home after short acute care stays.
- This research suggests that even children with short acute care stays have significant changes in emotional, behavioral, and executive functioning following TBI.
- Pre-injury factors are particularly important when considering outcome in this group of children.
- Future research is needed to further delineate the risk factors associated with neuropsychological outcomes following TBI in children and adolescents with short acute care stays.