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**“Functional Outcomes After Pediatric and Adolescent Trauma Inpatient Rehabilitation:
An Updated Single-Center Cohort”**

Introduction: Traumatic injury is a leading cause of pediatric and adolescent morbidity and mortality, and survivors requiring inpatient rehabilitation (IPR) need coordinated, diagnosis-specific treatment. Building on a prior single-center study of pediatric trauma IPR outcomes prior to our institutional trauma center verification (2018-2020), we describe functional progression in a larger, more recent cohort and compare the two to assess whether functional outcomes and injury patterns have changed over time.

Methods: We performed a retrospective review of trauma patients aged ≤ 18 years admitted to the inpatient rehabilitation unit at Manning Family Children's Hospital (formerly Children's Hospital New Orleans) between January 1, 2020, and June 3, 2026, applying inclusion and exclusion criteria matching the prior study. Pediatric Functional Independence Measure (WeeFIM) scores were abstracted at IPR admission and discharge across self-care, mobility, and cognitive domains. Functional progression (discharge minus admission) was assessed within diagnosis groups by paired t-tests and across groups - traumatic brain injury (TBI), spinal cord injury (SCI), and multitrauma (MT) - by ANOVA. Differences from the prior cohort were quantified as standardized mean differences (Hedges g).

Results: One hundred thirteen patients were included (TBI $n=67$, SCI $n=38$, MT $n=8$); mean age was 11.8 years and 71.7% were male. Median hospital and IPR length of stay were 22 and 29 days, and 84.1% required durable medical equipment at discharge (SCI 94.7%). All groups made significant functional progression, but patterns differed by diagnosis. TBI patients improved across all cognitive items, whereas SCI patients presented with near-ceiling cognitive admission scores (5.9-6.3) and improved cognitively only in social interaction ($p=0.012$). Progression differed across groups for stairs, locomotion, bowel, feeding, and all cognitive items. Compared with the 2018-2020 cohort ($n=95$), core findings were reproduced and between-cohort discharge scores differed negligibly ($|Hedges\ g| < 0.5$ for all items). The injury profile shifted toward SCI (33.6% vs 19%) with prominent penetrating trauma (firearm 25.7% overall, 57.9% of SCI), and return to school was lower (82.6% vs 94.2%).

Conclusions: In a larger, more recent cohort, pediatric and adolescent trauma patients showed durable, diagnosis-specific functional gains during inpatient rehabilitation alongside an evolving injury profile - more spinal cord injury, a high burden of penetrating trauma, and lower return to school - underscoring the need for coordinated, injury-specific follow-up and school reintegration support.