

# When a major injury occurs again in children, it's too often no accident

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Among U.S. children who survive major trauma—bodily injuries severe enough to require a hospital stay—nearly 3 percent experience another sudden injury in the same year and nearly one in five of these repeated injuries is due to violence, according to new research findings presented at the American College of Surgeons Clinical Congress 2019.

"We know that [trauma](#) is the leading cause of death in [children](#)," said Adil A. Shah, MD, the study's lead investigator and a surgical resident at Howard University Hospital in Washington, D.C. "However, among those [young patients](#) who survive, the proportion who come back to the hospital with a different traumatic [injury](#) and their [risk factors](#) were previously unquantified."

Every year 9.2 million children and teens up to age 19 receive treatment for nonfatal injuries in emergency rooms, and more than 12,000 die, the Centers for Disease Control and Prevention (CDC) reports.

Nationwide, Dr. Shah and his colleagues found that 8,309 children aged 18 years and younger returned to the hospital with another severe or moderately [severe injury](#) that same year, a 2.9 percent recurrence rate. Of those patients, 16 percent—more than 1,300 children and teenagers—had three or more trauma-related hospital admissions in a year, according to the study abstract.

This rate of repeated injury among children is too high, said senior investigator Mikael Petrosyan, MD, FACS, a pediatric surgeon at

Children's National Medical Center in Washington, D.C.

"Once a child has a major trauma, he or she shouldn't be coming back again to the hospital with similar types of injuries," he said.

To uncover their findings, the researchers analyzed 286,508 records of pediatric major trauma cases over 2010 to 2015 from the National Readmissions Database. This database includes hospital discharge records from 27 states with readmissions in the same calendar year. The investigators then separated out which admissions resulted from a different injury than the original. They also studied the risk factors for and costs of sustaining more than one major injury in a year.

### **Risks and costs of repeated injury**

Repeated trauma patients ranged in age from as young as 7 years to 17, and the most common site of severe injury was the head and neck, occurring in 11.3 percent, Dr. Shah reported. Intentional injuries affected 19 percent of repeated trauma patients versus less than 12 percent of the other trauma patients; 10 percent were reportedly due to self-injury and 9 percent, due to assault.

Compared with patients in whom trauma did not recur, repeated trauma patients:

- Were 22 percent as likely as to come from lower-income families and 30 percent as likely to have public health insurance, such as Medicaid.
- Had a 42 percent increased likelihood of drug use and a twofold increased likelihood of having depression or psychosis.
- Had an odds of more than 2 to 1 of having penetrating injuries—usually gun or stab wounds—at their first hospital admission.

- Had nearly twice the odds of having higher injury severity at their first admission.
- Had an 80 percent higher likelihood of having left the hospital against medical advice for their initial injury.

Reasons why children left the [hospital](#) against medical recommendations are unknown and likely varied, Dr. Shah noted. He speculated that finances might have been a concern because repeated trauma patients were more likely to belong to families in the lowest income quartile.

Furthermore, the researchers found that readmission cost \$8,386 more than the first [hospital stay](#), with an estimated excess cost of \$1.2 million per year. Although the reasons for the increased cost are unclear, Dr. Shah said that because many of these patients had public insurance, "the burden placed on U.S. health care expenditure is immense."

He added that their study likely underestimates the true recurrence rate of pediatric major trauma, which they called "trauma recidivism." The National Readmissions Database does not capture records of injured patients who are readmitted in a different year.

## **Recommendations**

Senior investigator Dr. Petrosyan said more research is needed: "This study opens up an opportunity to look further at this problem of why there is a high incidence of recidivism after [major trauma](#) in children."

Echoing that thought, Dr. Shah said, "We hope our findings will be a starting point for identifying children at risk for trauma recidivism, so health care providers can intervene early after the initial exposure to traumatic stimuli."

Interventions could include making appropriate referrals for follow-up

care in cases of injuries associated with mental illness or drug abuse as well as increasing efforts to prevent childhood injury and violence, he suggested.

Provided by American College of Surgeons

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