

# Risk factors for unplanned hospital readmission following pediatric neurosurgery

May 17 2016

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More than 10 factors were identified as increasing risk for patient readmission in this population. Credit: UAB

Researchers at The University of Alabama at Birmingham have determined specific risk factors associated with hospital readmission following pediatric neurosurgery. Some of these are related to the specific surgical procedure performed (for example, cerebral spinal fluid

[CSF] shunt placement or CSF shunt revision), others to postoperative complications (such as surgical site infection), and still others to patient demographics (Native American race). The risk factors that were identified are discussed in the article "Risk factors for unplanned readmission within 30 days after pediatric neurosurgery: a nationwide analysis of 9799 procedures from the American College of Surgeons National Surgical Quality Improvement Program, by Brandon A. Sherrod, BS, James M. Johnston, MD, and Brandon G. Rocque, MD, MS, published today online, ahead of print, in the *Journal of Neurosurgery: Pediatrics*.

Hospital readmission rates are often used to determine the quality of treatment received by patients. The authors undertook this study to identify baseline readmission rates for a variety of pediatric neurosurgical procedures and to determine what [risk factors](#) lead to patient readmission in this population.

As the title suggests, the authors pulled data from the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) Pediatric database. This database contains prospectively collected patient data from 50 participating hospitals; previous studies of readmission focused on data from single institutions. Eligible for the study were 9,799 neurosurgical procedures performed in patients younger than 18 years old. Of these procedures, 1,098 (11.2%) were followed by an unplanned [hospital readmission](#) within 30 days.

The authors examined relationships between unplanned readmissions and patient demographics, patient comorbidities, preoperative lab values, types of primary surgery undergone during the hospital stay, postoperative complications, and operation and hospital variables (such as need for transfusion, length of hospital stay, or whether the patient was admitted via the emergency department). Both univariate and multivariate analyses were performed.

The overall hospital readmission rate was 11.2%, and the time between the primary surgical procedure and readmission was  $14.04 \pm 7.74$  days (mean  $\pm$  standard deviation).

The four surgical procedures associated with the highest rates of readmission included the following: CSF shunt revision (17.3%), repair of a myelomeningocele larger than 5 cm in diameter (15.4%), CSF shunt placement (14.1%), and craniectomy to remove an infratentorial tumor (13.9%).

The strongest predictor of hospital readmission was postoperative infections, with surgical site infection leading the group.

Other independent risk factors for hospital readmission that were identified include postoperative pneumonia, urinary tract infection, sepsis, Native American race, long-term steroid use, need for oxygen supplementation or nutritional support, seizure disorders, and long operative times.

Some of the risk factors, such as infection, can be modified by health professionals. Others, such as the need for oxygen supplementation or nutritional support, cannot be modified, but their presence can identify patients "who could benefit from discharge planning or direct efforts to facilitate safe hospital discharge without readmission."

When asked, the corresponding author, Dr. Brandon Rocque said, "The importance of this study is the realization that most of the factors that increase the risk of readmission cannot be controlled by physicians or hospitals. We must be careful using readmission as a way to measure quality of care. Counting a [readmission](#) as evidence of lower quality care has the potential to unfairly judge a health system."

**More information:** Sherrod BA, Johnston JM, Rocque BG: Risk

factors for unplanned readmission within 30 days after pediatric neurosurgery: a nationwide analysis of 9799 procedures from the American College of Surgeons National Surgical Quality Improvement Program. *Journal of Neurosurgery: Pediatrics*, published online, ahead of print, May 17, 2016; [DOI: 10.3171/2016.2.PEDS15604](https://doi.org/10.3171/2016.2.PEDS15604).

Provided by Journal of Neurosurgery Publishing Group

Citation: Risk factors for unplanned hospital readmission following pediatric neurosurgery (2016, May 17) retrieved 27 April 2024 from <https://medicalxpress.com/news/2016-05-factors-unplanned-hospital-readmission-pediatric.html>

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