



Quality measures play an increasingly important role in the delivery and reimbursement of medical care. Quality assessment measures have not been well developed for pediatric neurosurgical patients. This report documents our experience in extracting information from an administrative database to establish the rate of return to system (RTS) within 30 days of pediatric neurosurgical procedures.

Demographic, socioeconomic, and clinical characteristics were prospectively collected for all patients undergoing neurosurgical procedures over one year. Manual and automated reviews of emergency department records were conducted. The primary end point was an unexpected return to the hospital system within 30 days after index surgery.

There were 1358 procedures. ED admission preceded 37.4% of surgeries. Medicare/Medicaid was the payee for 54.9% of surgeries. 37.6% of surgeries were shunt-related. There were 169 unexpected returns to the system within 30 days, and 116 were related to the index surgery (related returns).

Monthly rate of unplanned return was 8.6 +/- 2.5%. Analyzing related returns only (n=116), patients with shunt-related surgery were more likely to return to system (O.R. 1.86, p=0.008) and require surgery on readmission (O.R. 3.28, p=0.004). Because extended hospitalization shortens the window of time for readmission after surgery, extended length of stay protects against returns. Importantly, if related and unrelated returns were analyzed together (n=169), no independent risk factor for return to system was identified. Common concerns were headache, nausea, vomiting or seizure after shunt or cranial surgery (n=65) and wound concerns (n=30). 32% of returns required surgery.

The graph displays two data series: Hospital length of Stay (days) in red and ICU length of Stay (days) in blue. The x-axis represents length of stay categories from 2 to More than 14 days. The y-axis represents the length of stay in days, ranging from 0 to 600. Both series show a general downward trend until the 'More than 14 days' category, where they both increase significantly.

Length of Stay Category	Hospital length of Stay (days)	ICU length of Stay (days)
2	530	310
4	265	90
6	105	40
8	85	35
10	50	20
12	40	25
14	30	20
More than 14	255	140

Postoperatively, patients are generally discharged only a few days later, or undergo a prolonged hospital stay

Quality assessment measures must be carefully defined, and surgeons must play a role in development of measures to ensure meaningful results. Certain patients, such as those who undergo VP shunt placement, are more likely to return to the health care system after surgery, and this may relate to factors other than quality of health care.

Manual versus Automated Analysis of ED Returns

Year: 2012	Related emergency department returns – automated method	Related returns- manual review
Number	105	109
Independent risk factors	<p>Length of Stay: 0.001 (O.R. 0.932, 95% CI 0.894-0.972)</p> <p>Shunt-related procedure 0.025 (O.R. 1.676, 95% CI 1.067-2.631)</p>	<p>Length of Stay: 0.002 (O.R. 0.933, 95% CI 0.893-0.975)</p> <p>Shunt-related procedure 0.008 (O.R. 1.857, 95% CI 1.179-2.924)</p>

An automated method to query the electronic medical record reliably detected related returns to the ED

We developed an automated method to quantify patients returning to the ED with neurosurgical complaints based on keywords in the ED record or the ordering of a head CT. This method detected almost all related returns to system for neurosurgical patients.