

Return to Health Care System for Pediatric Neurosurgery Patients: Establishing a Baseline for Quality Measurement



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Introduction

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.

Methods

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.

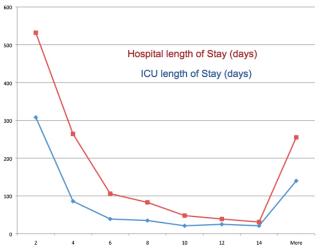
Results

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).

Patient Characteristics			
4,278 surgeries (2010-12)			
Admission through ER	1,618 (37.8%)		
Medicaid	2,232 (52.2%)		
Average length of stay	11.9 days (median: 3 days)		
Age	7.0 +/- 6.3 years (median: 6 years)		
Length of Surgery	87.9 +/- 101.1 minutes (median: 50 min)		
ICU stay	1,959 (45.8%)		
Shunt	381 (36%)		
Craniotomy	256 (24%)		
Demographics of all patients included in study			

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.





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

Neurosurgical Reasons for ED Return

Chief Complaint	Number
Headache/nausea/vomiting/seizure	62 (57%)
Fever	6 (6%)
Wound concerns	30 (28%)
Other	11 (10%)

Conclusions

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.

Multivariate Analysis of Risk Factors for Return to System

	Dependent Variable		
	All returns	Related returns	Re-operation
Number	148	109	37
Independent risk factors	None	Length of Stay: 0.002 (O.R. 0.933, 95% CI 0.893-0.975)	Length of Stay: 0.030 (O.R. 0.905, 95% CI 0.826-0.990)
		Shunt-related procedure 0.008 (O.R. 1.857, 95% CI 1.179-2.924)	Shunt-related procedure 0.004 (O.R. 3.276, 95% CI 1.450-7.398)

Prolonged length of stay reduced the chance of RTS within 30 days of surgery and shunt surgery increased the chance of RTS

Manual versus Automated Analysis of ED Returns

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

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

We developed an automated method to quantify patients returning to the ED with neuorsurgical 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.