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## *Illinois EMS for Children* **Pediatric Mild Traumatic Head Injury in the Emergency Department Survey Summary Report, 2008**

### **Abstract**

From July through October of 2008, Illinois EMS for Children (EMSC) conducted a statewide quality improvement survey regarding the management of pediatric mild traumatic head injury in the Emergency Department. The survey is part of a larger initiative that also includes retrospective medical record reviews. This report summarizes the survey results.

Responses were obtained from 110 Illinois area hospitals (91% response rate).

Areas of particular note included the following:

- Only 28% of responding facilities reported that they have a policy/guideline/clinical pathway for traumatic head injury. Less than half of these policies specifically addressed pediatrics.
- All facilities reported that they have CT scanners, with scans typically read by in-house radiologists (86%) and external radiologist consultant services (59%). External consultant services were more commonly used downstate (78%) when compared with the Chicago area (40%).
- Neurosurgical services were not easily accessible in Illinois, with only 7% of facilities reporting on-site availability of pediatric neurosurgeons, and 16% with adult neurosurgeons who had pediatric neurosurgical privileges. 60% of facilities reported that, in the past 3 months, they transferred all of their pediatric ED patients when they needed neurosurgical consultation or services.

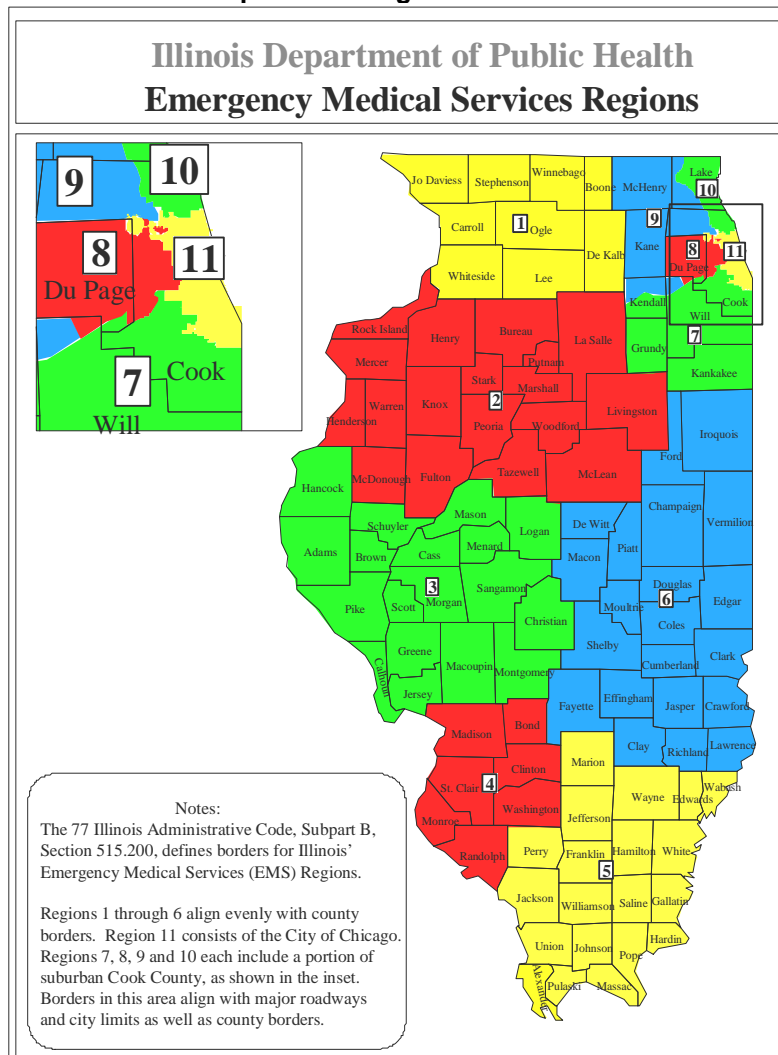
This summary report provides additional analyses. Following the report an appendix presents a line listing of all questions and total responses (beginning on page 6).

## I. Results Summary

In 2008, 121 emergency departments (EDs) actively participated in the Illinois EMSC regional CQI program. Of these, 109 are recognized as PCCC, EDAP or SEDP facilities. The 121 EDs were surveyed regarding their management of mild pediatric head trauma using a Web-based application.

Of the 121 facilities, 110 (91%) participated in the survey. After data submission, participants are provided with Web-based reports that allow comparison of their results to their region, to similar sized facilities, and to the rest of the state. For this summary, responses were aggregated for facilities in the Chicago and suburban areas (regions 7 through 11 – please see map below) and compared with those for the rest of the state (regions 1 through 6).

Map of EMS Regions in Illinois



Separately, responses were aggregated for “larger” facilities (greater than 6,000 pediatric ED visits per year) and compared with “smaller” facilities (6,000 or less visits). Significant differences found in these comparisons are noted in this summary.

### **Policies/Clinical Guidelines**

- 28% of responding facilities reported that they have a policy/guideline/clinical pathway for traumatic head injury.
- For facilities with policies, 42% reported that it specifically addressed pediatrics, and 58% reported that a process for screening for signs of child maltreatment/neglect was addressed in the policy. Also for these facilities, more than half reported that their policies identify specific criteria to determine the need for CT neuroimaging. The most commonly reported criteria included: focal neurologic findings/deficits (61%), Glasgow coma score - e.g., less than 14 (55%), positive loss of consciousness (55%), history of seizure (52%), changes in mental status/history of abnormal behavior (52%), and multi-system trauma (52%).

### **CT Scanning Practices**

- All responding facilities reported that they have CT.
- CT scans were most frequently read by in-house radiologists (86% of facilities) and external radiologist consultant services (59%). 24% of facilities reported that in-house emergency department physicians also read CT scans.
- The use of external radiologist consultant services to read CT scans was more likely downstate (78%) than in the Chicago area (40%). This was the case even for larger facilities with more than 6,000 pediatric ED visits per year that were located downstate (67% of this subgroup used external radiologist consultant services).

### **Availability of Neurosurgical Services**

- Only 7% of facilities reported that pediatric neurosurgeons were available at their facilities either 24/7 (5%) or for limited coverage (2%). Only one downstate facility reported pediatric neurosurgeon availability, and it was for limited coverage.
- 16% of facilities reported that adult neurosurgeons with pediatric neurosurgical privileges were available at their facilities with, at least, limited coverage. Downstate facilities were less likely to have such neurosurgeons available (11%) than Chicago area facilities (22%).
- 60% of facilities reported that, in the past 3 months, they transferred all of their pediatric ED patients when they needed neurosurgical consultation or services. An additional 10% of facilities reported that they transferred more than half of these patients.

## Discharge Planning

- 79% of facilities provide pediatric-specific traumatic head injury discharge instructions/patient education to their patients/families. When provided, these materials typically include: signs/symptoms that prompt a return visit to the ED for immediate care (97%); referral to primary care provider for follow up (94%); signs/symptoms of postconcussive syndrome (89%); pain management measures (83%), and an emergency phone number to call (82%).
- Nearly all facilities (99%) have a process in place to ensure the patient/caregiver understands the discharge instructions/patient education provided to them. Typically these include the patient/caregiver signing a copy of the form to be included in the medical record that demonstrates understanding (93%), as well as a clinical ED staff member (MD/RN) documenting the discussion in the medical record (72%). 28% of facilities reported that a clinical ED staff member (MD/RN) conducts a follow up phone call to the patient/caregiver within a specified length of time (e.g., within 24 hours of discharge).

## Quality Improvement

- 41% of facilities reported that they conduct chart reviews of patients with SEVERE or MODERATE traumatic head injuries (e.g., GCS  $\leq$  13) for quality improvement purposes. For those facilities that conduct chart reviews, the most common items checked were: GCS upon initial assessment (91%), vital signs (87%), patient disposition (87%), and mechanism of injury (82%).
- 27% of facilities reported that they conduct chart reviews of patients with MILD traumatic head injuries (e.g., GCS =14 or 15) for quality improvement purposes. For those facilities that conduct chart reviews, the most commonly items checked were: GCS upon initial assessment (90%), patient disposition (80%), and patient/caregiver discharge instructions/education (77%).

## **II. Conclusions**

This survey constitutes the first part of Illinois EMSC's quality improvement effort to address the care of pediatric patients with mild traumatic head injury in the ED. In addition to the survey, facilities are currently performing retrospective record reviews. Further, both the survey and record review process will be duplicated in the summer/fall period of 2009 in order to assess for improvements in care and management of this pediatric population.

As a result, the survey provides a baseline of information regarding pediatric head injury practices. Of particular interest was the finding that only about one-fourth of facilities have a policy/guideline/clinical pathway for traumatic head injury, and less than half of these specifically address pediatrics. These policies can help assure consistency and quality of treatment and so offer an opportunity for improvement in ED practice.

The survey data also confirms statewide concerns regarding pediatric neurosurgery particularly in southern Illinois. The majority of surveyed facilities indicated that they transfer all of their pediatric patients in need of neurosurgery or related consultation. This information supports the EMSC facility recognition program in its emphasis on transfer agreements and practices.

All facilities reported that they have CT scanners on-site. An important component of this quality improvement effort will consist of examining criteria for performing CT scans, particularly as it relates to the anticipated national EMSC development of a decision rule in this area. Illinois EMSC will distribute further information regarding this decision rule as it becomes available.

Finally, less than half of surveyed facilities reported currently reviewing records for quality improvement purposes for severe or moderate pediatric head trauma patients, and only about one-fourth did so for mild head trauma patients. This suggests another opportunity for improvement in practice. The forms and reports developed for this statewide indicator should allow facilities to continue to monitor pediatric mild traumatic head injury as part of their internal quality improvement program.

**Appendix 1. Totals for All Survey Questions (N=110 Responses)**  
 (Note: Questions 1 through 3 asked for demographic data and are not reported here.)

		For reference, 100%:	
<b>4. Does your ED have a documented traumatic head injury policy/guideline/clinical pathway?</b>	28%		
<b>4.a. If your ED has a traumatic head injury policy/guideline/clinical pathway, does it specifically address pediatrics?</b>	42%		
<b>4.b. If your ED has a traumatic head injury policy/guideline/clinical pathway, is there within it a process for screening for signs of child maltreatment/neglect?</b>	58%		
<b>4.c. If your ED has a traumatic head injury policy/guideline/clinical pathway, does it identify any specific criteria to use in determining the need for CT neuroimaging?</b>			
Time of injury (e.g., within the last 24 hours)	32%		
Patient's age (e.g., less than 2 years of age)	23%		
History of recent recurrent head injury	26%		
Severity of mechanism of injury	48%		
Abnormal vital signs	42%		
Abnormal pupillary reactivity	48%		
Moderate/severe pain (headache)	32%		
Glasgow coma score (e.g., less than 14)	55%		
Suspicion of child maltreatment/neglect	32%		
Positive loss of consciousness	55%		
History of emesis	42%		
History of seizure	52%		
Changes in mental status/hx of abnormal behavior	52%		
Physical/palpable signs of skull fracture	45%		
Physical/palpable signs of scalp abnormalit(ies)	32%		
Focal neurologic findings/deficits	61%		
Multi-system trauma	52%		
Need for neurosurgical consult	26%		
None	23%		
Other	6%		

<b>4.d. If your ED has a traumatic head injury policy/guideline/clinical pathway, how recently has it been updated/reviewed?</b>		
In the past 6 months	30%	
In the past 12 months	40%	
Has not been updated/reviewed in the past year	30%	

<b>5. Does your ED have access to a CT scanner in-house?</b>	100%	
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<b>5.a. Is your CT scanner available at all times (24/7)?</b>	99%	
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<b>5.b. Does your ED have access to a CT Technician at all times (24/7)?</b>	97%	
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<b>5.c. Typically, who reads the pediatric head CT scans?</b>		
Radiologist in-house	86%	
Neurologist in-house	4%	
Neurosurgeon in-house	7%	
EM/ED Physician in-house	24%	
Radiology Resident in-house	12%	
Consult with a staff Radiologist via telemedicine	28%	
Consult with a staff Neurosurgeon via telemedicine	3%	
Consult with a staff Neurologist via telemedicine	1%	
Consult with a non-staff Radiologist service	59%	
Other	5%	

<b>5.d. Does your ED have a process in place to address/resolve discrepancies between preliminary CT scan findings and final CT scan findings?</b>	99%	
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<b>6. What neurosurgical services does your hospital provide?</b>		
Pediatric Neurosurgeon - at all times (24/7)	5%	
Pediatric Neurosurgeon - limited coverage	2%	
Adult Neurosurgeon with pediatric neurosurgical privileges - at all times (24/7)	12%	
Adult Neurosurgeon with pediatric neurosurgical privileges - limited coverage	5%	
Adult Neurosurgeon (provides no/minimal pediatric consultation services) - at all times (24/7)	29%	
Adult Neurosurgeon (provides no/minimal pediatric consultation services) - limited coverage	11%	
None	44%	
Other	6%	

<b>6.a. Approximately, what percentage of pediatric neurosurgical cases has your ED transferred for neurosurgical consultation/services in the past 3 months?</b>		
None	16%	
Half or less	15%	
More than half	10%	
All	60%	

<b>7. Does your ED provide pediatric-specific traumatic head injury discharge instructions/patient education to the patients/families?</b>	79%	
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<b>7.a. If your Emergency Department provides pediatric-specific traumatic head injury discharge instructions/patient education, what elements are included ?</b>		
Signs/symptoms of Postconcussive Syndrome	89%	
Expected course of recovery	59%	
Signs/symptoms to prompt a return visit to the ED for immediate care	97%	
Emergency phone number to call	82%	
Referral to Primary Care Provider for follow up	94%	
Pain management measures	83%	
When to return to sports/gym/play	63%	
Safety information (e.g., proper helmet use, seatbelt use, etc.)	32%	
Information specifically regarding possible cognitive problems (e.g., changes in performance and/or behavior in the classroom, in organized activities, etc.)	39%	
Links to additional Traumatic Head Injury resources	10%	
Other	1%	

<b>8. Does your ED have a process in place to ensure the patient/caregiver understands the discharge instructions/patient education provided to them?</b>	99%	
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<b>8.a. If your ED has a process to ensure the patient/caregiver understands the discharge instructions/patient education provided to them, what is included in the process?</b>		
Patient/caregiver signs a copy of the form to be included in the medical record to demonstrate understanding	93%	
Clinical ED staff member (MD/RN) documents the discussion in the medical record	72%	
Clinical ED staff member (MD/RN) conducts a follow up phone call to patient/caregiver within a specified length of time (e.g., within 24 hours of discharge)	28%	

Non-medical/clerical ED staff member conducts a follow up phone call to patient/caregiver within a specified length of time (e.g., within 24 hours of discharge)	9%	
As part of a routine QI review process for patients who return within a 72-hour time frame	28%	
Other	3%	

<b>9. Does your hospital conduct chart reviews of patients with SEVERE or MODERATE traumatic head injuries (e.g., GCS = 13) for QI purposes?</b>	41%	
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<b>9.a. If chart reviews are conducted for patients with SEVERE or MODERATE traumatic head injury, what QI indicators are included?</b>		
Mechanism of injury	82%	
Appropriate use of safety equipment (when applicable)	49%	
Vital signs	87%	
Screening for child maltreatment/neglect	51%	
Pain level	76%	
GCS upon initial assessment	91%	
Pupillary assessment	76%	
History of abnormal behavior	42%	
History of emesis	44%	
History of positive loss of consciousness	64%	
Focal neurologic findings/deficits assessment	60%	
Skull fracture assessment	44%	
Scalp abnormality assessment	40%	
Other body system involvement/multi-trauma assessment	62%	
Neurologic reassessment	62%	
CT scan consent	29%	
Follow up with patient re: discrepancies between preliminary and final CT scan findings	56%	
Neurosurgical consult ordered	47%	
Patient disposition	87%	
Reason for transfer (when applicable)	82%	
Patient/caregiver discharge instructions/education	60%	
Other	9%	

<b>9.b. If chart reviews are conducted for patients with SEVERE or MODERATE traumatic head injury, is this information reviewed at some type of formal QI committee/process within your organization?</b>	86%	
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<b>10. Does your hospital conduct chart reviews of patients with MILD traumatic head injuries (e.g., GCS = 14) for QI purposes?</b>	27%	
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<b>10.a. If chart reviews are conducted for patients with MILD traumatic head injury, what QI indicators are included?</b>		
Mechanism of injury	70%	
Appropriate use of safety equipment (when applicable)	57%	
Vital signs	70%	
Screening for child maltreatment/neglect	63%	
Pain level	73%	
GCS upon initial assessment	90%	
Pupillary assessment	57%	
History of abnormal behavior	40%	
History of emesis	47%	
History of positive loss of consciousness	73%	
Focal neurologic findings/deficits assessment	53%	
Skull fracture assessment	37%	
Scalp abnormality assessment	33%	
Other body system involvement/multi-trauma assessment	53%	
Neurologic reassessment	70%	
CT scan consent	33%	
Follow up with patient re: discrepancies between preliminary and final CT scan findings	47%	
Neurosurgical consult ordered	37%	
Patient disposition	80%	
Reason for transfer (when applicable)	70%	
Patient/caregiver discharge instructions/education	77%	
Other	13%	

<b>10.b. If chart reviews are conducted for patients with MILD traumatic head injury, is this information reviewed at some type of formal QI committee/process within your organization?</b>	76%	
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