NQF #IEP-007-10
Appropriate Head CT Imaging in Adults with Mild Traumatic Brain Injury

Measure Description

Rationale: Head computed tomography (CT) imaging is frequently performed in adult patients with mild traumatic injury. Clinical decision rules to identify adults with mild traumatic injury at very low risk of intracranial injury have been validated and incorporated into consensus evidence-based guidelines.[1]

Goal: To reduce the unnecessary use of head CT in extremely low-risk trauma patients.

Measure: Percent of adult patients who presented within 24 hours of a non-penetrating head injury with a Glasgow coma score (GCS) >13 and underwent head CT for trauma in the ED who have a documented indication consistent with guidelines[1] prior to imaging.

Level of Analysis: Facility

Organization: Partners HealthCare

[1] Jagoda AS, Bazarian JJ, Bruns JJ Jr, Cantrill SV, Gean AD, Howard PK, Ghajar J, Riggio S, Wright DW, Wears RL, Bakshy A, Burgess P, Wald MM, Whitson RR; American College of Emergency Physicians; Centers for Disease Control and Prevention. Clinical policy: neuroimaging and decision-making in adult mild traumatic brain injury in the acute setting. Ann Emerg Med. 2008 Dec;52(6):714-48. PubMed PMID: 19027497.

<table>
<tr><td>Measure Title</td><td>Appropriate Head CT Imaging in Adults with Mild Traumatic Brain Injury</td></tr>
<tr><td>Brief description of measure</td><td>Percent of adult patients who presented within 24 hours of a non-penetrating head injury with a Glasgow coma score (GCS) >13 and underwent head CT for trauma in the ED who have a documented indication consistent with guidelines[1] prior to imaging.</td></tr>
<tr><td>Numbers</td><td>ED-Rad-1</td></tr>
<tr><td>Numerator Statement</td><td>Number of denominator patients who have a documented indication consistent with the ACEP clinical policy for mild traumatic brain injury prior to imaging</td></tr>
<tr><td>Numerator Details</td><td>Indications for Head CT in patients presenting to the ED for mild traumatic brain injury:
<table>
<tr><td>Patients with loss of consciousness or posttraumatic amnesia AND
Headache OR
Vomiting OR
Age>60 OR
Drug/alcohol intoxication OR
Short-term memory deficits OR
Evidence of trauma above the clavicles OR
Posttraumatic seizure OR
GCS<15 OR
Focal neurological deficit OR
Coagulopathy*</td><td>Patients without loss of consciousness or posttraumatic amnesia AND
Severe headache OR
Vomiting OR
Age>65 OR
GCS<15 OR
Physical signs of a basilar skull fracture OR
Focal neurological deficit OR
Coagulopathy* OR
Dangerous Mechanism**</td></tr>
</table>
*Patient taking anticoagulation (warfarin, fractionated or unfractionated heparin) or has a documented coagulation disorder
**Dangerous mechanism of injury includes: ejection from a motor vehicle, a pedestrian struck, and a fall from a height of more than 3 feet or 5 stairs.</td></tr>
<tr><td>Denominator Statement</td><td>Number of adult patients undergoing head (brain) CT for trauma who presented within 24 hours of a non-penetrating head injury with a Glasgow Coma Scale (GCS) ≥14</td></tr>
<tr><td>Denominator Inclusion</td><td>● Head CT performed in ED (with or without contrast)
● Age ≥16 years
● Non-penetrating head trauma
● ED presentation within 24 hours of injury
● GCS 14 or 15 on initial ED evaluation</td></tr>
</table>

Denominator Exclusions	Incorrect population for guideline - Age <16 years - GCS <14 on initial ED evaluation - obvious penetrating skull injury or obvious depressed skull fracture - patients with multisystem trauma - returned for reassessment of the same injury - pregnant
Data Source	Initial sampling will be based upon patients receiving a non-contrast head CT (based on appropriate CPT or HCPCS procedure code) in the ED. Chart review, electronic medical record (EMR) or clinically enriched administrative data (e.g. CPT-2 codes).It is not possible to collect this measure from standard administrative data.
Intended Use	Internal quality improvement and public reporting
Specification Notes	
References	ACEP Clinical Policy is largely based on the Canadian Head CT Criteria and the New Orleans Head CT Criteria 1: Jagoda AS, Bazarian JJ, Bruns JJ Jr, Cantrill SV, Gean AD, Howard PK, Ghajar J, Riggio S, Wright DW, Wears RL, Bakshy A, Burgess P, Wald MM, Whitson RR; American College of Emergency Physicians; Centers for Disease Control and Prevention. Clinical policy: neuroimaging and decision-making in adult mild traumatic brain injury in the acute setting. Ann Emerg Med. 2008 Dec;52(6):714-48. PubMed PMID: 19027497. 2: Stiell IG, Clement CM, Rowe BH, Schull MJ, Brison R, Cass D, Eisenhauer MA, McKnight RD, Bandiera G, Holroyd B, Lee JS, Dreyer J, Worthington JR, Reardon M, Greenberg G, Lesiuk H, MacPhail I, Wells GA. Comparison of the Canadian CT Head Rule and the New Orleans Criteria in patients with minor head injury. JAMA. 2005 Sep 28;294(12):1511-8. PubMed PMID: 16189364. 3: Haydel MJ, Preston CA, Mills TJ, Luber S, Blaudeau E, DeBlieux PM. Indications for computed tomography in patients with minor head injury. N Engl J Med. 2000 Jul 13;343(2):100-5. PubMed PMID: 10891517.

Sample Data Collection Form for NQF #IEP-007-10
Appropriate Head CT Imaging in Adults with Mild Traumatic Brain Injury

Name: _____

MRN: _____

Date: _____

Study ( ) CT Head

( ) Contrast / ( ) No Contrast

Indication – circle one

Patients *with* loss of consciousness or posttraumatic amnesia AND	Patients *without* loss of consciousness or posttraumatic amnesia AND
• Headache OR • Vomiting OR • Age>60 OR • Drug/alcohol intoxication OR • Short-term memory deficits OR • Evidence of trauma above the clavicles OR • Posttraumatic seizure OR • GCS<15 OR • Focal neurological deficit OR • Coagulopathy*	• Severe headache OR • Vomiting OR • Age>65 OR • GCS<15 OR • Physical signs of a basilar skull fracture OR • Focal neurological deficit OR • Coagulopathy* OR • Dangerous Mechanism**

*Patient taking anticoagulation (warfarin, fractionated or unfractionated heparin) or has a documented coagulation disorder

**Dangerous mechanism of injury includes:

- ejection from a motor vehicle
- a pedestrian struck
- fall from a height of more than 3 feet or 5 stairs.