

MONTHLY FEATURE CPG SOPR SUMMARY – Jan/Feb 2024

CPG Citation: Valente JH, Anderson JD, Paolo WF, Sarmiento K, Tomaszewski CA, Haukoos JS, Diercks DB. Clinical Policy: Critical Issues in the Management of Adult Patients Presenting to the Emergency Department with Mild Traumatic Brain Injury. *Annals Emerg Med.* 2023 May; 81(5): e63-e105. PubMed ID: 37085214.

Downloadable at: doi: 10.1016/j.annemergmed.2023.01.014.

Scope of Guideline: CPG Recs are written for ED providers (physicians, residents, assistants).

Inclusion: The guideline is intended for **adults with blunt head injury (Q1/Q2), or adults diagnosed with mild traumatic brain injury or concussion (Q3).**

Exclusion: Not intended for patients with a **history of a bleeding disorder, pregnant patients, patients with a primary presentation of a seizure disorder, pediatric patients, patients with an obvious open or penetrating head injury, or patients with unstable vital signs with multisystem trauma.**

Questions Addressed:

- Q1. In the adult emergency department (ED) patient presenting with minor head injury, are there clinical decision tools to identify patients who do not require a head CT?***
- Q2. In the adult ED patient presenting with minor head injury, a normal baseline neurologic examination, and taking an anticoagulant or antiplatelet medication, is discharge safe after a single head CT?***
- Q3. In the adult ED patient diagnosed with mild traumatic brain injury or concussion, are there clinical decision tools or factors to identify patients requiring follow-up care for post-concussive syndrome (PCS) or to identify patients with delayed sequelae after ED discharge?***

Key Recommendations: Each recommendation is accompanied by the “strength” of recommendation, and/or the level of evidence (LoE) supporting that recommendation

Recommendations	Strength, LoE
<u>FOR Clinical Action</u> Q1. Use the Canadian CT Head Rule (CCHR) to provide decision support and improve head CT utilization in adults with a minor head injury.	Level A
Q1. Use the National Emergency X-Radiography Utilization Study (NEXUS) Head CT decision tool (NEXUS Head CT) or the New Orleans Criteria (NOC) to provide decision support in adults with minor head injury; however, the lower specificity of the NEXUS Head CT and NOC compared with CCHR may lead to more unnecessary testing.	Level B

<p>NEUTRAL Clinical Action</p> <p>Q2. Provide instructions at discharge that include the symptoms of rare, delayed hemorrhage after a head injury (Consensus recommendation).</p> <p>Q2. Consider outpatient referral for assessment of both fall risk and risk/benefit of anticoagulation therapy (Consensus recommendation).</p> <p>Q3. Consider referral for patients with PCS and the following potential risk factors = female sex; previous preconcussive psychiatric history; GCS score <15; etiology of assault, acute intoxication; LOC; and preinjury psychological history such as anxiety/depression.</p>	<p>Level C</p> <p>Level C</p> <p>Level C</p>
<p>AGAINST Clinical Action</p> <p>Q1. Do not use clinical decision tools to reliably exclude the need for head CT in adult patients with a minor head injury on anticoagulation therapy or antiplatelet therapy exclusive of aspirin.</p> <p>Q2. Do not routinely perform repeat imaging in patients after a minor head injury who are taking anticoagulants or antiplatelet medication and are at their baseline neurologic examination, provided the initial head CT showed no hemorrhage.</p> <p>Q2. Do not routinely admit or observe patients after a minor head injury who are taking anticoagulants or antiplatelet medications, who have an initial head CT without hemorrhage, and who do not meet any other criteria for extended monitoring.</p>	<p>Level C</p> <p>Level B</p> <p>Level B</p>

CLINICAL COMMENTARY: For both adult (and children) with minor head injuries, there are well-validated CDRs to guide decision-making for imaging. In adults, only the Canadian CT Head rule has Level A supporting evidence.

A newly published CDR (*CMAJ 2023 December 4;195:E1614-21. doi: 10.1503/cmaj.230634*) describes a new CDR for elderly patients who have fallen and may not need a CT head, but this is still at the derivation stage, and awaits future prospective validation.

Benefits of Recommendations:

- Benefits of using CDRs = decreased radiation, costs, ED length of stay and improved patient flow. In rural/small volume settings with limited CT access, appropriate application of the CCHR can limit transfers to CT scanning centers and associated resource costs.
- After a negative CT with normal neurologic exam with patients on anticoagulants/ antiplatelets agents, only those elderly patients on warfarin are at risk of delayed ICH (Grewal 2021).
- For patients at risk of post-concussive syndrome, consider referral to concussion treatment services after ED discharge. Cognitive testing for concussion symptoms have not proven to be reliable for incidence of PCS, and need for subsequent referrals/ treatment programs.

- Implementation of a validated Level A CDR (ie. the Cdn CT Head rule) can easily be operationalized into a prospective QI performance metric, as use of head CT scans can be collected from administrative data, and application of the CCHR can be gleaned from the corresponding patient charts (electronic, manual chart review).

Harms/Adverse Effects of Recommendations:

- Misapplication leading to unnecessary CT scans/ radiation exposures, as well as missed injuries/under-triage. Unnecessary additional downstream testing, increased costs and hospitalizations for false positives.
- Post-concussive syndrome is a loosely defined condition, and not likely to be accurately diagnosed during the index ED visit. If available, out-patient referral for follow-up at an adult head injury clinic could be warranted.

Facilitators of Uptake: Digital access for common CDRs can be found at the “Links to CDRs” section below. Incorporating CDRs into computerized decision support systems (CDSS) within electronic health records (EHRs) can facilitate accessing the tool during patient care when determining if a CT head is warranted or not (ie. either passive information, or forced functioning – must complete CDR form in EHR before test can be ordered).

Barriers to Uptake: Unawareness of, or unwillingness to use validated CDRs can lead to over-scanning of low-risk patients, and harms outlined above.

Prior Guideline Recommendations/Relevant Evidence: This Policy updates prior Recs from the ACEP 2008 document.

Links to CDRs:

- 1) Canadian CT Head Rule: <https://www.mdcalc.com/canadian-ct-head-injurytrauma-rule>
- 2) New Orleans/Charity Head Trauma/Injury Rule: <https://www.mdcalc.com/new-orleans-charity-headtrauma-injury-rule>
- 3) NEXUS Head CT: <https://bit.ly/NEXUSHeadCT>

Table 1. Clinical decision tools. (Used with permission).

	Canadian CT Head Rule ⁴⁷	New Orleans Criteria ⁴⁸	NEXUS Head CT ⁴⁹
High-risk features for predicting patients with CIBI	Any one of: <ul style="list-style-type: none"> • Failure to reach GCS score of 15 within 2 hours of injury • Suspected open skull fracture • Signs of basal skull fracture • Vomiting more than once • Age greater than 64 y 	Any one of: <ul style="list-style-type: none"> • Headache • Vomiting • Age over 60 y • Drug or alcohol intoxication • Deficits in short-term memory • Physical evidence of trauma above the clavicles • Posttraumatic seizure 	Any one of: <ul style="list-style-type: none"> • Evidence of skull fracture • Scalp hematoma • Neurologic deficit • Abnormal level of alertness • Abnormal behavior • Persistent vomiting • Coagulopathy • Age 65 y or greater
Exclusion Criteria	<ul style="list-style-type: none"> • Age <16 y • Blood thinners • Seizure after injury 	<ul style="list-style-type: none"> • GCS score of <15 • Age ≤3 y 	<ul style="list-style-type: none"> • GCS score of <15

CIBI, clinically important brain injury; CT, computed tomography; GCS, Glasgow Coma Scale.

Funding: ACEP Clinical Policies Group

Conflicts of Interest: None declared.

Key Words: Adult, clinical decision rules, mild traumatic brain injury, post-concussive syndrome

****CPG Quality/ Trustworthiness Standards**

Amalgamated from AGREE-II/NEATS instruments.

1. The clinical practice guideline (CPG) discloses and states explicitly its funding source.	✓
2. Financial conflicts of interest of guideline development group (GDG) members have been disclosed and managed.	✓
3. The CPG development group includes all of the relevant multidisciplinary stakeholders, including clinicians, methodologists and patients/caregivers. Patient safety advocates present.	✓
4. The CPG objectives, health questions, scope of relevant providers and target recipients of care are clearly defined.	✓
5. Values/preferences of patients, caregivers, advocates and/or the public with experience with the clinical disease management has been sought/integrated into CPG development (reported clearly).	X
6. The search strategy for evidence is thoroughly developed and described.	✓
7. The criteria for selecting relevant studies/evidence are clearly described.	✓
8. The quality, strengths and limitations of the body of evidence are clearly described (e.g., GRADE, Cochrane, etc.). Summaries of evidence tables are provided. Evidentiary Table in Appendix	✓
9. The health benefits, side effects, and risks were considered in formulating the recommendations.	✓
10. There is an explicit approach linking the evidence to formulate the recommendations.	✓
11. The strength of recommendations is clearly reported, including confidence in underlying evidence.	✓

12. Recommendations are clear and unambiguous, and easily identified in the CPG publication.	✓
13. Different options for management for managing the health questions are clearly presented.	✓
14. Experts externally reviewed the guideline prior to its publication. Open 60d review period of drafts for feedback from ACEP members, and “other pertinent physician organizations.”	?
15. The CPG describes a procedure to update the guideline.	X
16. The CPG provides advice, tools and/or clinical pathways for easy adoption/adaptation into practice. Appendices contain CDC implementation tools.	✓
17. The CPG describes barriers and facilitators to implement recommendations.	X
18. Performance metrics for monitoring implementation of recommendations for audit/feedback have been defined appropriately.	X
19. Resource implications for implementing CPG recommendations have been discussed.	✓

Methodological Threats to Validity:

As with most historical ACEP Policies, these publications are generally lacking in robust patient/caregiver engagement for management values, priorities & preferences (although this has been improving over recent years). Similarly, there is a lack of discussion of barriers & facilitators to implement recommendations, nor any suggested performance metrics for QI measurement during implementation.

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GUIDELINES