CLINICAL DECISION RULE I

Pediatric Mild Head Injury and Need for Head CT

Objectives:

To learn to locate and assess the clinical usefulness of a published clinical prediction or decision rules and to appropriately apply them to the care of individual patients as well as to the development of clinical policies.

This includes:

1. Determining the proper ranking in an ascending hierarchy of evidence for a particularclinical prediction or decision rule.
2. Assessing the rule's applicability to and likely impact on your clinical practice.

Assignment:

1. Read the attached scenario.
2. Devise a PICO question and electronic search engine strategy to locate applicable clinical evidence.
3. Read the attached guidelines for reading articles pertaining to clinical prediction or decision rules.
4. Use the attached worksheet as a guide to your assessment.

In approaching this exercise, it will be useful to keep in mind that the development of a prediction or decision instrument generally involves multiple studies. Study designs pertaining to issues of diagnosis, prognosis and therapy are commonly encountered, depending on the nature of the instrument, the phase of development and the inclinations of the investigators. The learner will find knowledge of the therapy, diagnosis and prognosis modules useful and prerequisite to comfortable completion of this exercise. We suggest that, after reading the scenario, you read the Users' Guides chapter and then examine the design of the Critical Review Form in relationship to the chapter before proceeding to the critical appraisal of the studies.

Clinical Scenario:

An ambulance from Northeast County EMS arrives to the pediatric trauma bay. They had arrived on the scene of an 8 year old girl who had fallen off her bicycle in the driveway unwitnessed and not wearing a helmet. Per EMT, she was awake but drowsy upon their arrival with no signs of neurological deficit. Her mother came outside of the house after hearing her brothers calling for help. The EMT assess her vital signs and they are normal. They find her GCS to be 14.

On arrival into the trauma bay, she is awake, intermittent alert but drifts off to close her eyes. She complains that her tummy hurts and vomits. Her pupils are equal and reactive, she will follow simple commands, and she will answer to her name. She remembers arriving at the hospital in an ambulance but not how she fell. There are no focal neurological deficits. There is a small abrasion under the hair on the back part of her head. *Is a CT scan indicated and what is the likelihood of finding a clinically relevant intracranial injury?*

PICO Question
Population: Pediatric patient with mild head trauma
Intervention: Referral to head computed tomography scan
Comparison: Routine observation
Outcome: Admission to pediatric neurosurgery service for management of intracranial injury

You are now so intrigued by all aspects of pediatric head trauma care that you forego the usual after-shift beers so you can go directly to the library for an exciting literature search.

You conduct PubMed search combining the key words "head CT", "pediatric head trauma", and "clinical prediction rule" yields 23 responses from which five significant articles are selected.

Enclosed Materials:

1. Guyatt G, Rennie D, Meade MO, Cook DJ Editors, The Users' Guides to the Medical Literature, A Manual for Evidence-Based Clinical Practice. 3rd Edition. McGraw-Hill 2015, Chapter 19.4.

2. Kuppermann N, Holmes JF, Dayan PS, et al.; Pediatric Emergency Care Applied Research Network (PECARN). Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study. Lancet. 2009 Oct 3;374(9696):1160-70. (Derivation and Validation)

3. Osmond MH, Klassen TP, Wells GA, et al.; Pediatric Emergency Research Canada (PERC) Head Injury Study Group. CATCH: a clinical decision rule for the use of computed tomography in children with minor head injury. CMAJ. 2010 Mar 9;182(4):341-8. (Derivation)

4. Dunning J, Daly JP, Lomas JP, Lecky F, Batchelor J, Mackway-Jones K; Children's head injury algorithm for the prediction of important clinical events study group CHALICE. Derivation of the children's head injury algorithm for the prediction of important clinical events decision rule for head injury in children. Arch Dis Child. 2006 Nov;91(11):885-91. (Derivation)

5. Schonfeld D, Bressan S, Da Dalt L, Henien MN, Winnett JA, Nigrovic LE. Pediatric Emergency Care Applied Research Network head injury clinical prediction rules are reliable in practice. Arch Dis Child. 2014 May;99(5):427-31. (Validation)

6. Bressan S, Romanato S, Mion T, et. al.; Implementation of adapted PECARN decision rule for children with minor head injury in the pediatric emergency department. Acad Emerg Med. 2012 Jul;19(7):801-7 (Validation)

7. Worksheet for evaluating an article on Clinical Prediction Rules