MD+CALC

PECARN Pediatric Head Injury/Trauma Algorithm

Predicts need for brain imaging after pediatric head injury.

Why?

- There are over **600,000** annual emergency department visits in the US for pediatric head trauma.
- Unlike in adults, head CT imaging in pediatric patients is believed to be associated with a higher lifetime **risk of lethal malignancy**.
- Applying the PECARN Pediatric Head Injury Prediction Rule allows providers to identify which pediatric patients can be safely discharged without a head CT.

When?

- Use to safely rule out the presence of clinically important traumatic brain injuries in the pediatric population.

How?

Access clinical tool here!

Pearls

- Most widely-validated prediction rule for pediatric head trauma:
  - >99% sensitivity for ciTBI
- Only applies to children with **GCS ≥14!**
- Although the largest trial of its kind, the PECARN study had low rates of TBI on Head CT (5.2%) and even lower rates of ciTBI (0.9%) – this suggests overall TBI in children is rare!
- Definition of **clinically-important traumatic brain injury (ciTBI)**:
  - Death from traumatic brain injury (TBI)
  - Neurosurgical intervention for TBI
  - Intubation of more than 24 hours for TBI
  - Hospital admission of 2 nights or more for the TBI

Pitfalls

- PECARN is not a substitute for physician judgment. Subtle neurological changes, age <3-4 months, parental concern, or non-accidental trauma may still warrant imaging or observation despite a "low-risk" score.

Primary Resource

Kuppermann N, Holmes JF, Dayan PS, Hoyle JD Jr, Atabaki SM, Holubkov R, Nadel FM, Monroe D, Stanley RM, Borgialli DA, Badawy MK, Schunk JE, Quayle KS, Mahajan P, Lichenstein R, Lillis KA, Tunik MG, Jacobs ES, Callahan JM, Gorelick MH, Glass TF, Lee LK, Bachman MC, Cooper A, Powell EC, Gerardi MJ, Melville KA, Muizelaar JP, Wisner DH, Zuspan SJ, Dean JM, Wootton-Gorges SL; 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. doi: 10.1016/S0140-6736(09)61558-0. Epub