

Evaluating PECARN-based appropriateness for head CT for leveled traumas in pediatric emergency medical care: a multi-disciplinary quality improvement project

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BACKGROUND

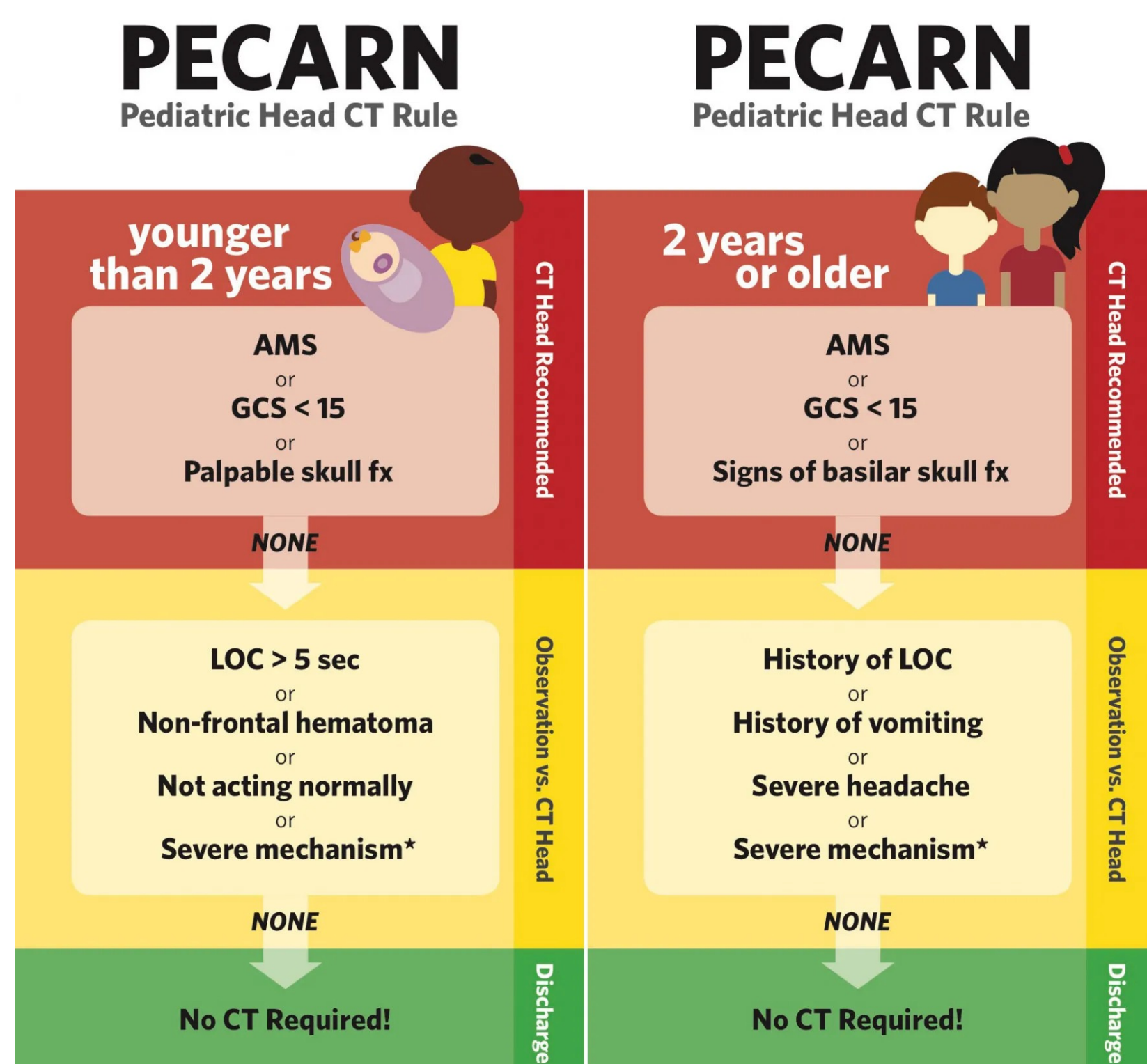
- Results from computed tomography (CT) in leveled pediatric trauma patients can provide data critical for clinical decision-making.
- In this radio-sensitive population, significant opportunity exists to reduce healthcare waste and harm by using evidence-based risk stratification tools.
- One widely used tool is the Pediatric Emergency Care Applied Research Network (PECARN) guidelines, which were released in 2009.

OBJECTIVES

We hypothesized that the **rates of CT imaging in leveled pediatric trauma patients presenting to Duke University Hospital Emergency Department is higher than the national average.**

METHODS

- We identified a retrospective cohort of **pediatric (age <15 years) leveled (1, 2, or 3) traumas** using Performance Services (PSWeb) dashboards to quantify the rate of head CT requesting in pediatric trauma activations between **7/1/2022 to 11/30/2023**.
- To evaluate adherence to PECARN criteria in a recent subset of these patients, we performed a **chart review** of trauma activations in November 2023:
- We determined each patient's **PECARN risk** (low, intermediate, high) and **whether criteria were met**:



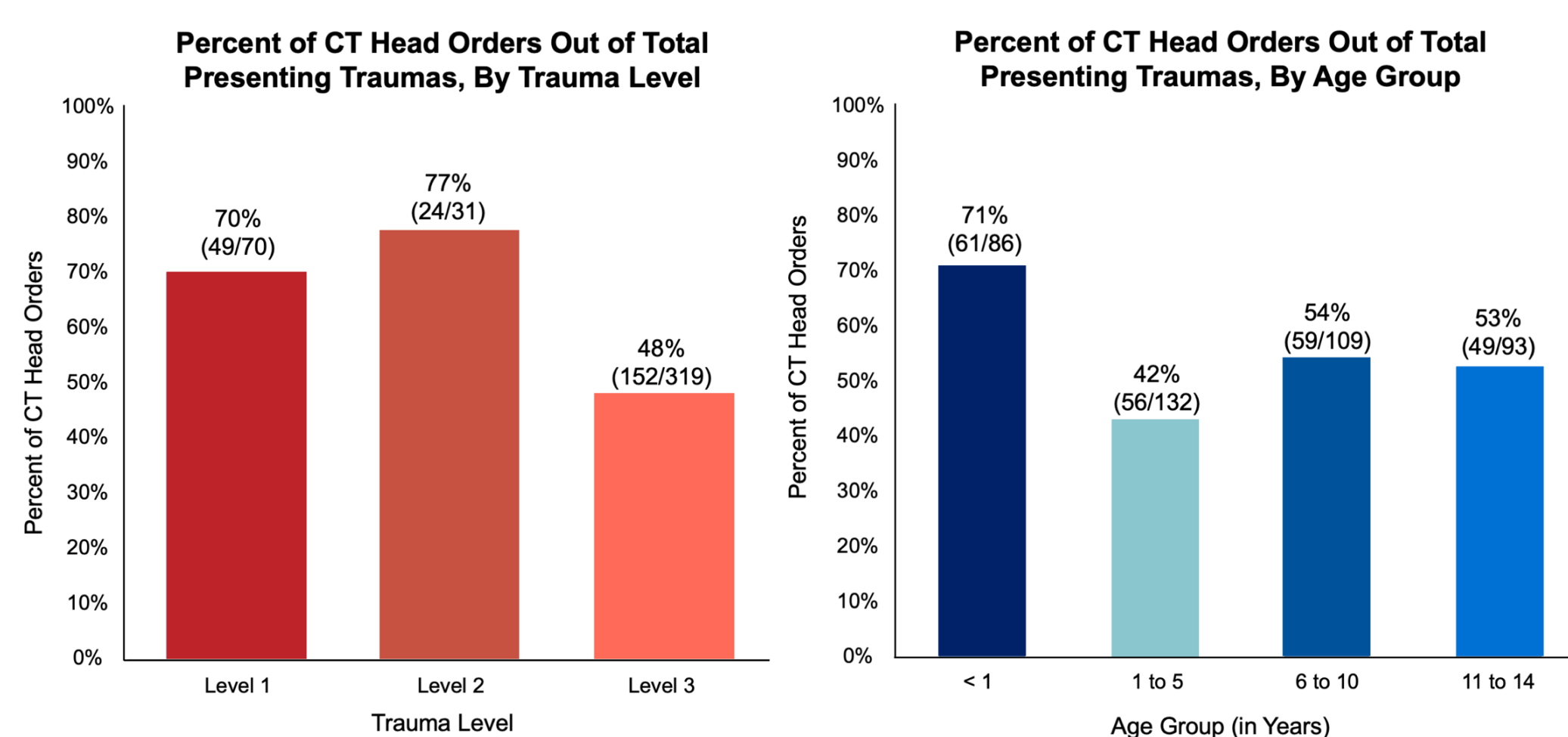
*SEVERE MECHANISMS: Motor vehicle accident, Fall > 3 ft, Fall > 5 ft, No helmet, Assault, Fire, Blast, Gunshot, etc.

PECARN + ALIEM canadivent Credit to Academic Life in Emergency Medicine (ALiEM) for this graphic

RESULTS

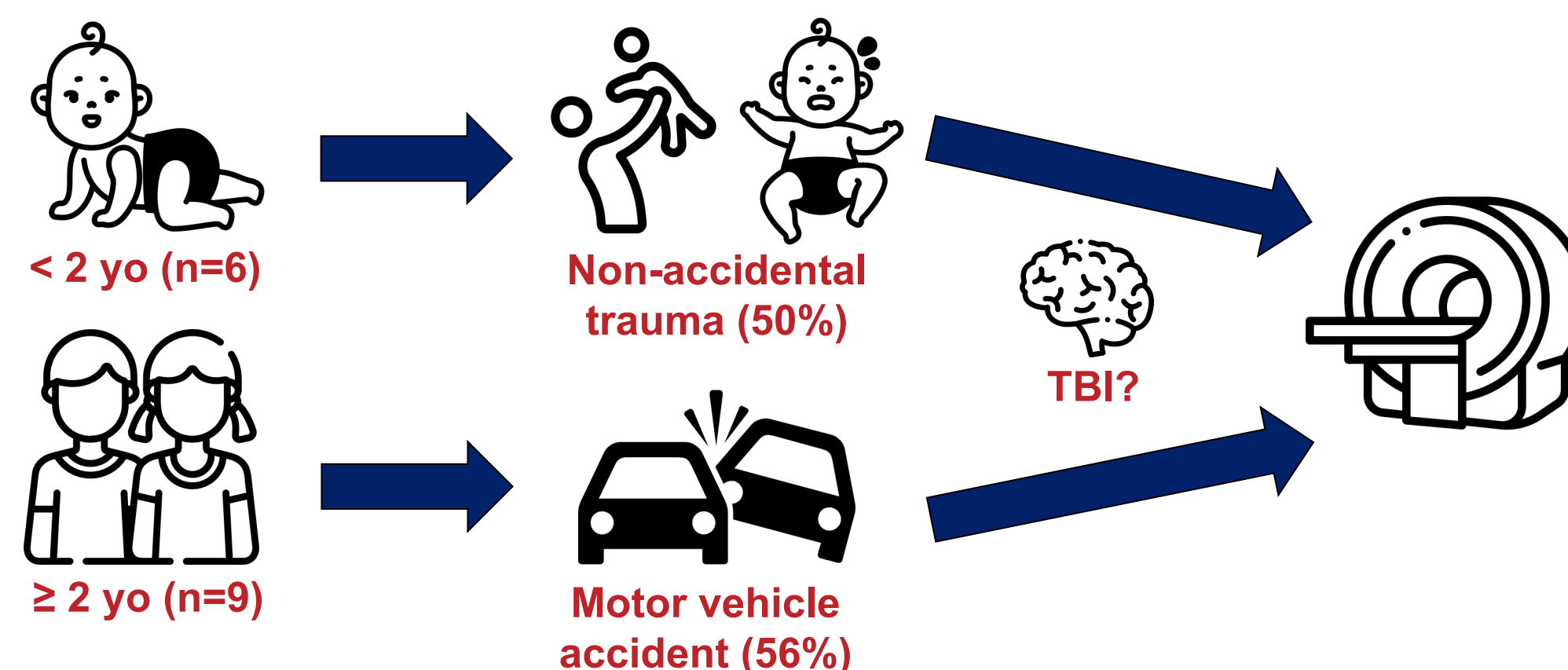
1. PSWeb dashboard results

- A total of 225 head CTs were requested for pediatric leveled traumas during this period.
- Of the 420 ED pediatric trauma activations, **53.6% (225/420) received a head CT**, more than double the national average of 20%.
- CT imaging was most common in **level 1 (70%; 49/70) and level 2 traumas (77%; 24/31)**, as well as **children < 1yo (71%, 61/86)**.



2. Chart review of recent traumas

- In November 2023, of 15 leveled traumas receiving a head CT, **26.7% (4/15) were categorized as low risk and did not meet PECARN criteria.**
- The most common injury mechanisms were:



CONCLUSIONS

- Our institutional rate of requesting head CTs for pediatric leveled traumas was found to be notably **higher than the national average.**
- Infants, the most vulnerable population to the adverse effects of radiation, had the highest rate of head CTs.
- Given our **inappropriately high rates of head CT imaging**, we have developed a **multi-disciplinary quality improvement team** to further characterize factors influencing rates of PECARN adherence.
- Results will inform development of **future quality improvement interventions** (printed PECARN guidelines, EMR tools) for pediatric imaging at Duke.