Southern Minnesota Regional Trauma Advisory Committee (SMRTAC)

Practice Management Guideline

Indications for Head CT in Injured Children

Pediatric **Practice Management Guideline**	**Effective: 11/2011**
Contact: SMRTAC Coordinator	**Last Reviewed: 08/2016**

Purpose

To delineate indications for obtaining head CT imaging in injured children.

Definitions

1. Pediatric trauma patient – any patient < 15 years of age who had sustained an injury.

Policy Statements

1. Traumatic brain injuries are the leading cause of death and disability in children.
2. More than 75% of all head injuries are categorized as mild and therefore may not require neuro-imaging.
3. There is growing recognition of potential untoward effects of ionizing radiation on the developing brain.
4. Clinical decision making regarding imaging in children must always include consideration of importance of injury identification in addition to radiation exposure risk.
5. Transfer should never be delayed for imaging.
6. If the decision to transfer has already been made, strong consideration should be given to not doing any radiographs prior to transport.
7. If images are not able to be shared with the receiving hospital in an expeditious manner, strong consideration should be given to not doing any radiographs prior to transport.
8. Data exists that defines individual risk for development of a clinically significant intra-cranial injury and should be utilized for decision making regarding need for neuro-imaging.
9. Children < 2 years of age are most sensitive to radiation, increasing the importance of sound clinical decision making in this population.

Procedure Statements

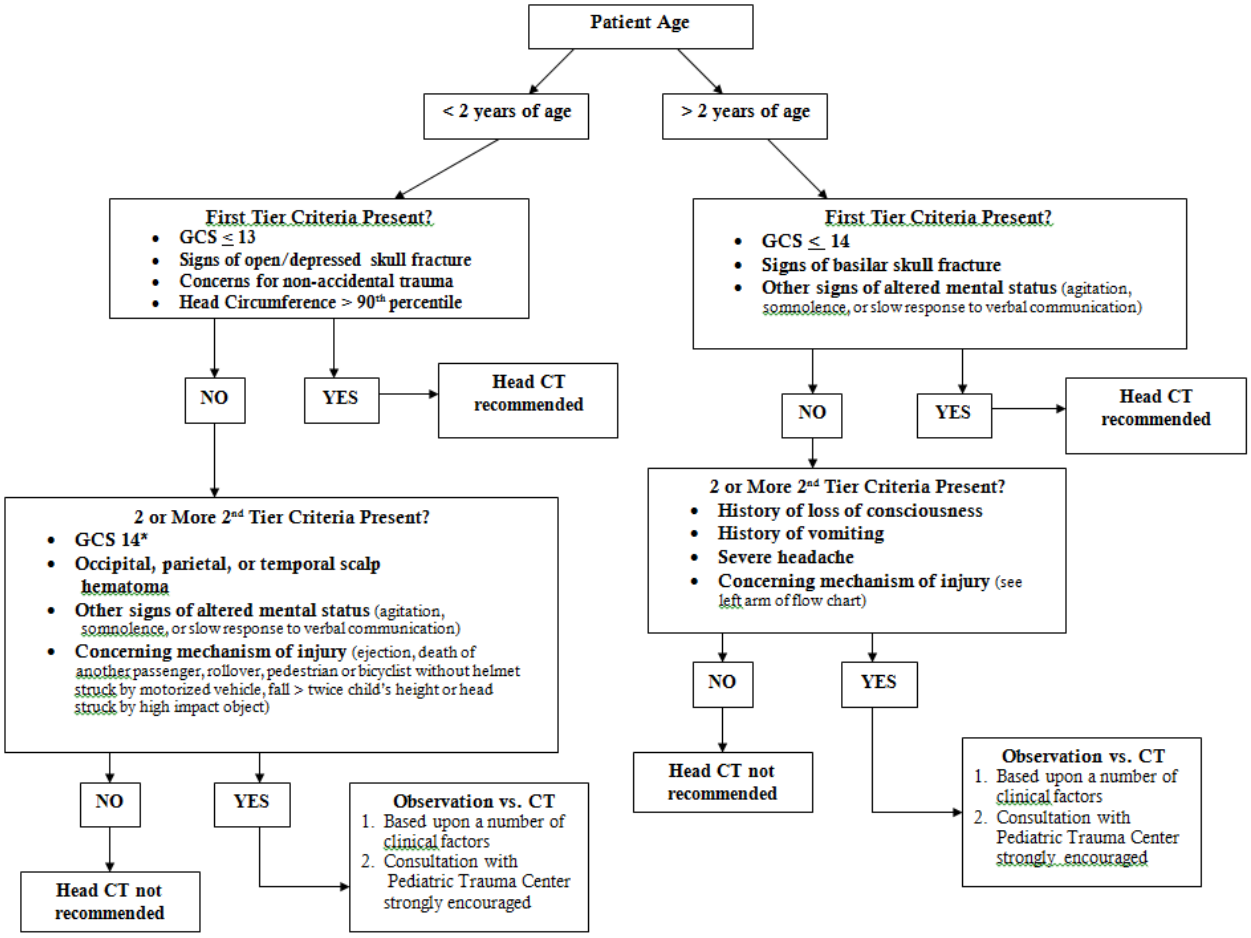
1. All pediatric trauma patients should have a primary and secondary survey examination following ATLS/CALS© guidelines which includes global neurologic assessment, level of consciousness (AVPU) and determination of a Glasgow Coma Score or Pediatric Glasgow Coma Score.
2. Child is less than 2 years of age
    a. Evaluate for presence of any of the following first tier criteria:
        i. GCS $\leq$ 13

ii. Signs of open, depressed, or basilar skull fracture
iii. Concerns for non-accidental trauma
iv. Head circumference > 90 percentile

b. If child meets any first tier criteria → Head CT is recommended
c. If none of the first tier criteria are met, evaluate for second tier criteria
    i. GCS 14
    ii. Occipital, parietal, or temporal scalp hematoma
    iii. Other signs of altered mental status (agitation, somnolence or slow response to verbal communication)
    iv. Concerning mechanism of injury (ejection from motorized vehicle, death of another passenger, rollover, pedestrian or bicyclist without helmet struck by motorized vehicle, fall > twice height or head struck by high impact object)
d. If child exhibits 2 or more second tier criteria and injury occurred within 2-3 hours of presentation a period of observation (1-2 hours) is recommended to monitor for symptom progression/resolution.
    i. If uncertain of need for imaging or if resources are not available for adequate observation, consultation with pediatric trauma center is recommended.

3. Child is greater than 2 years of age
    a. Evaluate for presence of any of the following first tier criteria:
        i. GCS $\leq$ 14
        ii. Signs of a basilar skull fracture
        iii. Other signs of altered mental status (agitation, somnolence or slow response to verbal communication)
    b. If child meets any first tier criteria → Head CT is recommended
    c. If none of the first tier criteria are met, evaluate for second tier criteria
        i. History of loss of consciousness
        ii. History of vomiting
        iii. Severe headache
        iv. Concerning mechanism of injury (ejection from motorized vehicle, death of another passenger, rollover, pedestrian or bicyclist without helmet struck by motorized vehicle, fall > twice height or head struck by high impact object)
    d. If child exhibits 2 or more second tier criteria and injury occurred within 2-3 hours of presentation a period of observation (1-2 hours) is recommended to monitor for symptom progression/resolution.
        i. If uncertain of need for imaging or if resources are not available for adequate observation, consultation with pediatric trauma center is recommended.

3. Patient must be monitored continuously while in CT.
4. If procedural sedation would be required to obtain images, consider transfer to a higher level of pediatric trauma care in lieu of sedation.
5. The risk of a clinical significant traumatic brain injury has been shown to be very low when children do not display specific subset of symptoms. In these patients a head CT is not recommended. See algorithm.



Resources/Links

Kupperman, N., Holmes, J., et al. Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study. Lancet. 2009;374: 1160-70

Prepared by: SMRTAC leadership/ Pediatric Subcommittee
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Disclaimer: This is a general guideline and is not intended as a substitute for clinical judgment or as a protocol for the management of all patients with head injury.