

Pediatric Imaging and Radiology Over Read Practice Guideline

Background:

Trauma is the leading cause of death in children and adolescents in the United States. Many factors, including the varying ages and developmental levels, can make assessing for injury challenging in the pediatric population. Clinicians must balance the need for accurate diagnostic data with the need to minimize radiation exposure in children. The clinician must ensure that each exam is justified based on the patient condition and current best practices.

Goals:

1. To provide a clear set of imaging guidelines for the pediatric trauma patient at CHOG
2. To discuss which high risk injuries/findings require immediate Radiology Attending over read

Imaging Guidelines:

To limit unnecessary imaging, recommendations are listed by body area and include recommendations for Head CT, C-spine imaging (in accordance with CHOG C-spine Clearance Algorithm), Chest CT or angiogram and Abdomen/Pelvis CT (with contrast). See Appendix A. Any imaging concerns, and those high-risk procedure/findings will be reviewed in Pediatric Trauma PI process.

High Risk Injuries requiring immediate Attending Radiology Over Read:

Imaging suspicious for the following high-risk injuries require Pediatric Radiology Attending over read if noted:

1. Atlanto-occipital dislocation
2. Penetrating head injury
3. Head CT findings concerning for child abuse
4. Traumatic aortic injury

The following studies require 100% Pediatric Radiology Attending over read:

1. Brain death exam in Nuclear Medicine study
2. Skeletal Survey to evaluate for child abuse

Additionally, if a service Attending physician has a concern with report of finding, they may request Radiology Attending over read at any time.
Appendix A
Pediatric Trauma Imaging Guidelines
Age < 13

Consider Head CT:

Age Less than 2 years:
- Altered Mental Status
- Scalp hematoma (other than frontal)
- Loss of consciousness - greater than 5 seconds
- Severe Injury mechanism
- Palpable skull fracture
- Not acting normal according to family

Age 2 or older:
- Altered Mental Status
- Loss of Consciousness
- Vomiting
- Severe injury mechanism
- Signs of basilar skull fracture
- Severe Headache

Follow CHOG C-spine clearance guideline for imaging guidelines

If patient meets Modified Memphis Criteria for obtaining a CTA of the neck, then reconstruction of the cervical spine is appropriate: however, still cannot clear spine based on CT alone.

Modified Memphis Criteria for Blunt Cerebrovascular Injury

Modified Memphis criteria use a set of screening criteria for blunt cerebrovascular injury (BCVI) in trauma. The presence of one or more of these criteria makes a CTA or DSA study necessary to exclude BCVI.

The screening protocol criteria for BCVI are:
- Base of skull fracture with involvement of carotid canal OR perrours temporal bone
- Cervical spine fracture
- Neurological findings not explained by neuroimaging
- Horner Syndrome
- Le Forte II or III fracture pattern
- Neck soft tissue injury (seatbelt sign, hanging, hematoma)

Chest CT/Angiogram is indicated:

Abnormal CXR in blunt trauma (widened mediastinum)
In penetrating trauma if concern for major vascular injury then consider chest CT/CTA.

Consider Abdomen/Pelvis CT WITH CONTRAST:

Positive FAST
- Abdominal wall bruising/seat belt sign
- GCS < 14 with concern for abdominal injury
- Thoracic wall trauma
- Complaints of abdominal pain
- Decreased breath sounds
- Inability to fully assess the abdomen with concern for abdominal trauma

- Abdominal wall or lower chest bruising
- Abdominal pain or tenderness
- Low blood pressure – NOT shock

Yes

No

CT scan

1. Positive Ultrasound OR
2. Increased AST/ALT → 200/125 OR
3. Gross Hematuria

Yes

No

Observe

CT scan