

**VANDERBILT UNIVERSITY MEDICAL CENTER
DIVISION OF TRAUMA AND SURGICAL CRITICAL CARE**

Trauma Radiology

1. Primary survey imaging studies
 - a. chest x-ray
 - i. should be considered mandatory for all intubated patients for tube position
 - ii. strongly recommended for all polytrauma patients
 - b. AP pelvis
 - i. strongly recommended in the setting of undifferentiated hemodynamic instability to rule-out open book pelvis fracture after blunt trauma
 - ii. otherwise indicated based on physical examination or patient complaint
2. Secondary survey radiology studies
 - a. Ultrasound
 - i. FAST examination
 1. greatest utility is with blunt patient with hemodynamic instability
 2. obtain four views
 - a. hepatorenal/Morrison's
 - b. splenorenal
 - c. pericardial
 - d. retrovesical
 - ii. Thoracic ultrasound
 1. Evaluate large pneumothorax
 - iii. Echocardiography
 1. Perform as indicated to evaluate cardiac activity, effusion
 - a. Subxiphoid 4 chamber
 - b. Parasternal long axis of
 - b. CT traumagram
 - i. should be obtained for patients with abnormal neurologic exam, history of loss of consciousness or amnesia, unreliable physical exam, or attending preference
 1. noncontrast of the head
 - a. repeat scans as recommended by consultants or for significant neurological change
 2. noncontrast of the cervical spine (occiput to T1) with reconstructions
 - a. negative scan in the absence of physical exam is not completely eliminate cervical spine injury
 3. IV contrasted scan of chest abdomen pelvis
 - a. unless contraindicated (history of renal insufficiency)
 - b. consider delayed film if renal injury
 4. thoracolumbar reconstructions
 - a. negative scan in the absence of physical exam effectively eliminates thoracolumbar injury and the patient can sit upright

- ii. Consider limited scan in the presence of intrauterine pregnancy to minimize radiation exposure to fetus. *However, care of the mother remains the top priority, and this must not be compromised by inadequate imaging studies.*
 - c. CT max-face
 - i. may be performed at time of initial traumagram if suspected significant facial injury (reduces transport from ICU to CT for repeat scan)
 - d. CT angiography of the neck
 - i. may be performed at the time of initial traumagram if suspected cervical vascular injury
 - 1. physical examination findings (e.g. cervical contusion)
 - ii. may be indicated for penetrating injury to the neck
 - iii. may require second dose of contrast if done in conjunction with traumagram
 - e. CT angiography of extremities
 - i. may be performed for suspected peripheral vascular injury
 - ii. may be inaccurate in the presence of retained ballistic fragment secondary to streak artifact
 - iii. may require patient repositioning and separate dose of contrast
 - f. extremity radiographs
 - i. performed on the basis of physical examination findings or patient complaint
 - ii. post reduction
 - g. cystogram
 - i. indicated for gross hematuria
 - ii. may be performed in conjunction with traumagram as a CT cystogram if hematuria is identified in the trauma bay
 - iii. bedside protocol: 300 cc of contrast with views to ensure visualization of potential posterior injury (lateral, postvoid, etc.)
 - h. retrograde urethrogram
 - i. may be obtained at the bedside using a red rubber or Foley catheter that is secured at the urethral meatus
 - ii. ideally obtained with fluoroscopy
 - i. MRI
 - i. indication as recommended by neurosurgical or spine consultants
 - ii. may be performed prior to post injury day 3 to eliminate cervical spine injury and facilitate collar removal
 - j. If patient presents with outside CT scan
 - i. repeat traumagram is not mandatory if outside images are adequate. While it is important to be mindful of radiation exposure, care must not be compromised secondary to inadequate imaging studies. When in doubt, reimaging.
 - ii. may require additional studies such as spinal reconstructions to complete full traumagram evaluation
 - iii. must be loaded into PACS server and official reading solicited from radiology
- 3. In-house patients
 - a. Chest X-Ray
 - i. obtained in the ICU for definitive clinical suspicion or abnormality, evaluation after invasive procedure, or chest tube follow-up
 - ii. routine daily portable chest x-rays are discouraged in the absence of indication
 - b. Tube feeding should not be started until position of feeding tube has been confirmed by radiograph. This does not apply to surgically or endoscopically placed tubes unless tube dislodgment is suspected.

4. Level 2 Traumas

- a. If trauma service consulted by emergency medicine, strongly consider obtaining full traumagram depending on mechanism.