Learning objectives

By the end of this activity, participants will be able to:

1. Understand different scenarios in which imaging is utilized in the ER
2. Know what test to expect and order in the setting of trauma
3. Summarize imaging use in the ER
Module Outline

I. Scenarios
II. Trauma
III. Wrap up/Questions

Many ER patients require imaging. It’s best to know what tests to order and expect in different clinical settings and scenarios.
Ordering the appropriate tests
It’s your second rotation of intern year. You’re feeling pretty good because your first rotation was an outpatient month and you killed it!

And then you start ED and your first shift is 7p-7a...

Well, here goes nothing!
Chart # 1

45yoM CC: Headache

- “Doc, I get headaches sometimes, but this is the worst headache of my life”

What test do you order?

Noncontrast Head CT!
Diffuse hyperdensity along the cerebral sulci and filling the basilar cisterns = subarachnoid hemorrhage
Chart # 2

21yoM CC: Chest Pain

- Started 2 hours ago, worsening
- Breath sounds are asymmetric

What test do you order?

CXR!
Large left pneumothorax with collapsed entire left lung and mediastinal shift = tension pneumothorax

Pneumothorax (air in the pleural space) may occur as result of:
- penetrating, blunt, or barotrauma
- iatrogenic (e.g. biopsy)
- surgery
- line placement
- thoracentesis
- mechanical ventilation
- bronchoscopy.

Signs on CXR:
- pleural line
- deep sulcus sign

tension pneumothorax (mass effect from ball valve mechanism may yield displaced mediastinum + poor venous return to the heart -> cardiovascular collapse and death)
8yoM CC: Scrotal Pain

- Acute onset

What test do you order?

Scrotal Ultrasound!
Color Doppler views of the left testicle and paired views of both testicles. Heterogeneous swollen left testis without internal vascularity = **TORSION**. Right testis shows normal flow and size.

Testicular Torsion is an Emergency... Call Urology!

Imaging findings:
- Swollen/edematous testis
- Heterogeneous echotexture
- Lack of flow on color Doppler
- Compare with adjacent normal testis
55yoM CC: Chest Pain

- “Doc, I have tearing chest pain”

You suspect aortic dissection; what test do you order?

CTA Chest Abdomen & Pelvis!
Aortic Dissection

Stanford classification
Type A: proximal to left subclavian: surgery
Type B: distal to left subclavian: medical management

Imaging findings:
Dissection flap
+/- aneurysmal dilatation of aorta
Differential opacification of true/false lumen
Thrombosed false lumen
+/- aortic rupture

Bonus for noticing dissection extending into brachiocephalic artery
78yoM CC: Cough

You breathe a sigh of relief. Finally something easy.

You suspect pneumonia; what test do you order?

CXR!
You prescribe antibiotics. Job well done!

Imaging findings:
Consolidation of most/entire lobe
Can have associated pleural effusion
Chest CT if worried about complications (empyema, lung abscess)
And Then...

You are finally getting the hang of this...

And then you hear an overhead page...

RED TRAUMA ETA NOW!
UNKyoM CC: MVA Rollover

- Obvious external injuries on visual inspection
- Hemodynamics are stable

What test do you order?

Post CXR and Pelvis Radiograph!
AP chest: opacity occupying much of the left upper hemithorax, do not see the aortic arch contour well…you get a CTA
AP pelvis: pubic symphysis diastasis (widening) and widening of the sacroiliac joints
Fractures of the bilateral superior and inferior pubic rami = open book pelvic fracture
Chart # 6

Two axial CTA images of the chest and one sagittal CTA image of the chest. Mediastinal hematoma surrounding the aorta with defect in the aortic wall (at the level of the ligamentum arteriosum) = Traumatic aortic transection
Aortic Transection

Vascular emergency
Often need aortic endovascular repair

Imaging findings
Aortic contour irregularity following trauma
Pseudoaneurysm formation
Mediastinal hematoma +/- frank rupture
Think Back!

Radiology is a VITAL part of the Emergency Room workup

Think ACR-AC for guidance on what study to order

Or call us! We are happy to help.

Any Questions?
References

Welcome to the UNC Radiology Residency Education Website!

We are pleased to provide this educational resource for our residency program!

UNC Rad Qeenda, subspecialty block ed resources, Phone Numbers, HSL, custom build e-books, helpful hints can be found on this site.

ABR Core exam intel
Block 18 Schedule
Chief's Survey
Radiology
RSNA Physics Modules

UNC Radiology Conference schedule 18-19

More at www.rads.web.unc.edu www.msrads.web.unc.edu
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Thank you!