

An axial CT scan of the abdomen showing the liver, spleen, kidneys, and surrounding structures. The scan is in grayscale, with the liver appearing as a large, dark, homogeneous mass on the right side of the image. The spleen is visible on the left side. The kidneys are seen as smaller, more defined structures. The surrounding soft tissue and bone structures are also visible.

Emergency Radiology

UNC Radiology Residency Educational Scholarship

University of North Carolina School of Medicine
Department of Radiology 2020

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SCHOOL OF MEDICINE
Radiology

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.

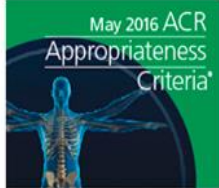
Ordering the appropriate tests

Home / Quality & Safety / Appropriateness Criteria®

QUALITY & SAFETY

- Accreditation
- Appropriateness Criteria®**
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- Quality Measurement
- NRDR Data Registries
- Radiology Safety
- RADPEER™
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ACR Appropriateness Criteria®



The ACR Appropriateness Criteria® (AC) are evidence-based guidelines to assist referring physicians and other providers in making the most appropriate imaging or treatment decision for a specific clinical condition. Employing these guidelines helps providers enhance quality of care and contribute to the most efficacious use of radiology. [Learn More »](#)

ACR Named a Qualified Provider-Led Entity by CMS

The Centers for Medicare & Medicaid Services (CMS) has named ACR a “qualified Provider-Led Entity” (qPLE) approved to provide appropriate use criteria (AUC) under the Medicare Appropriate Use Criteria program for advanced diagnostic imaging. This means that medical providers can consult ACR Appropriateness Criteria to fulfill impending Protecting Access to Medicare Act (PAMA) requirements that they consult AUC prior to ordering advanced diagnostic imaging for Medicare patients. [Read more »](#)

Access the appropriateness criteria ratings tables and narratives

← Click me!

Scenarios

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!

Chart # 1

Patient



Normal patient for comparison



Diffuse hyperdensity along the cerebral sulci and filling the basilar cisterns = **subarachnoid hemorrhage**

Chart # 2

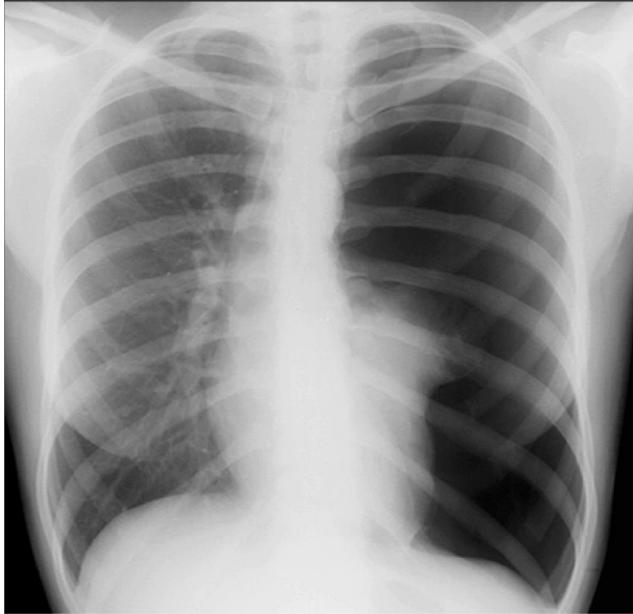
21yoM CC: Chest Pain

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

What test do you order?

CXR!

Chart # 2



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)

Chart # 3

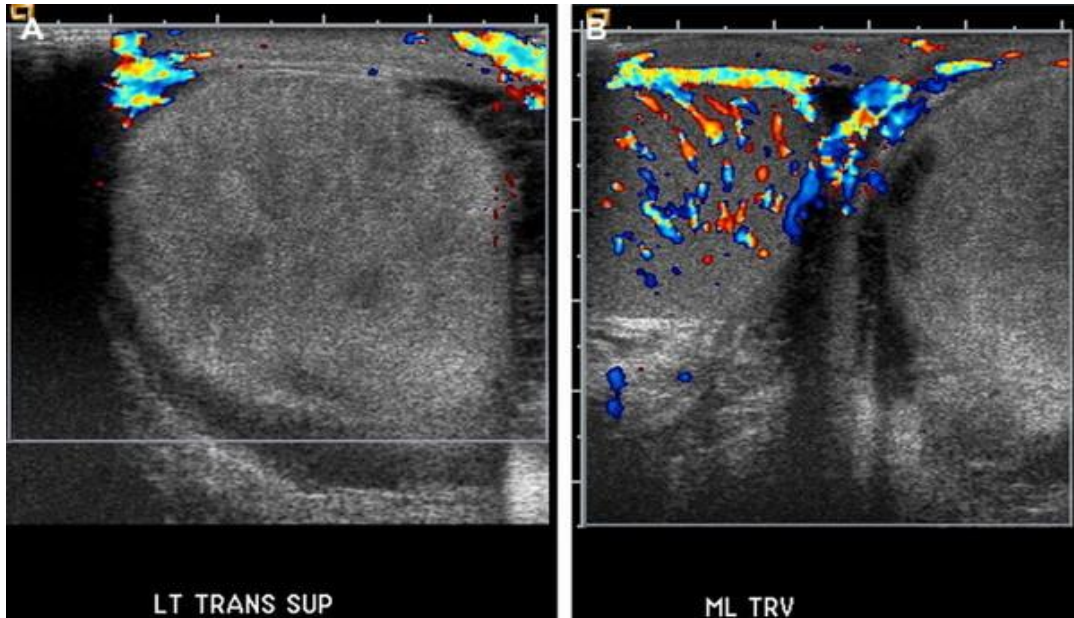
8yoM CC: Scrotal Pain

- Acute onset

What test do you order?

Scrotal Ultrasound!

Chart # 3



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

Chart # 4

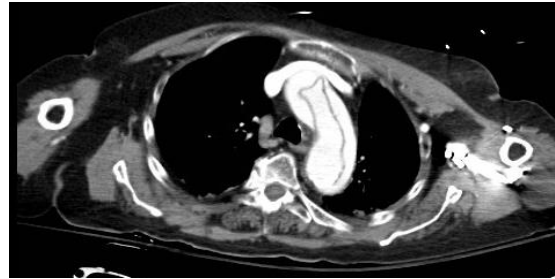
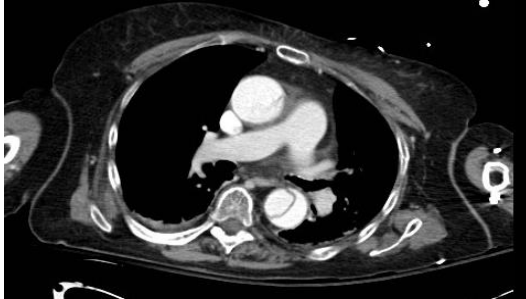
55yoM CC: Chest Pain

- “Doc, I have tearing chest pain”

You suspect aortic dissection; what test do you order?

CTA Chest Abdomen & Pelvis!

Chart # 4



CTA, axial, chest. Linear hypodense structure in the lumen of the ascending, transverse, and descending aorta. Both true and false lumens opacified = **Aortic Dissection**.

Bonus for noticing dissection extending into brachiocephalic artery

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

Chart # 5

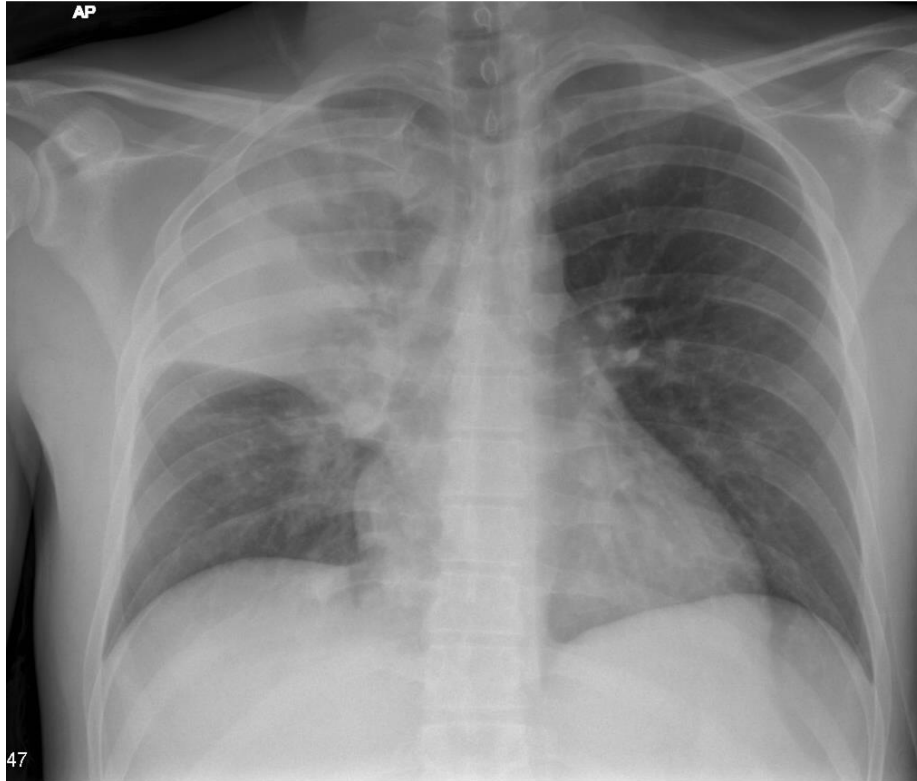
78yoM CC: Cough

You breathe a sigh of relief. Finally something easy.

You suspect pneumonia; what test do you order?

CXR!

Chart # 5



Lobar pneumonia

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!

TRAUMA

Chart # 6

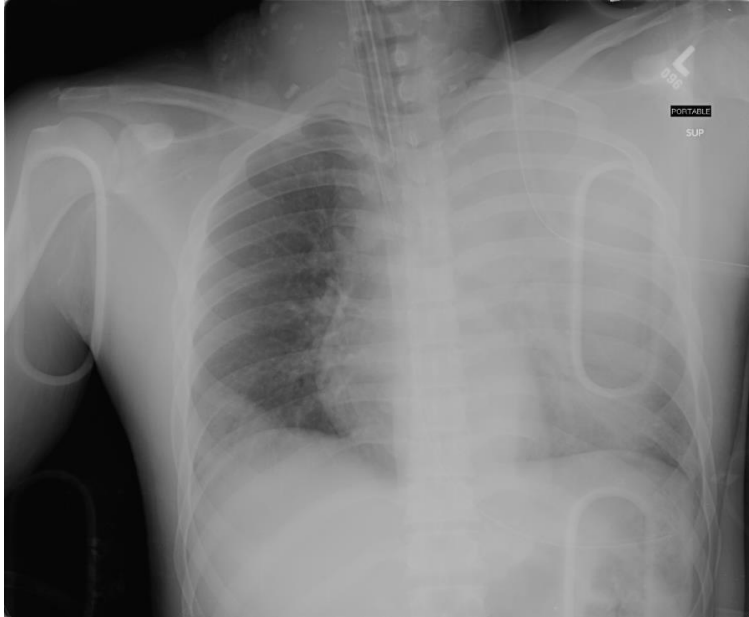
UNKyoM CC: MVA Rollover

- Obvious external injuries on visual inspection
- Hemodynamics are stable

What test do you order?

Post CXR and Pelvis Radiograph!

Chart # 6



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

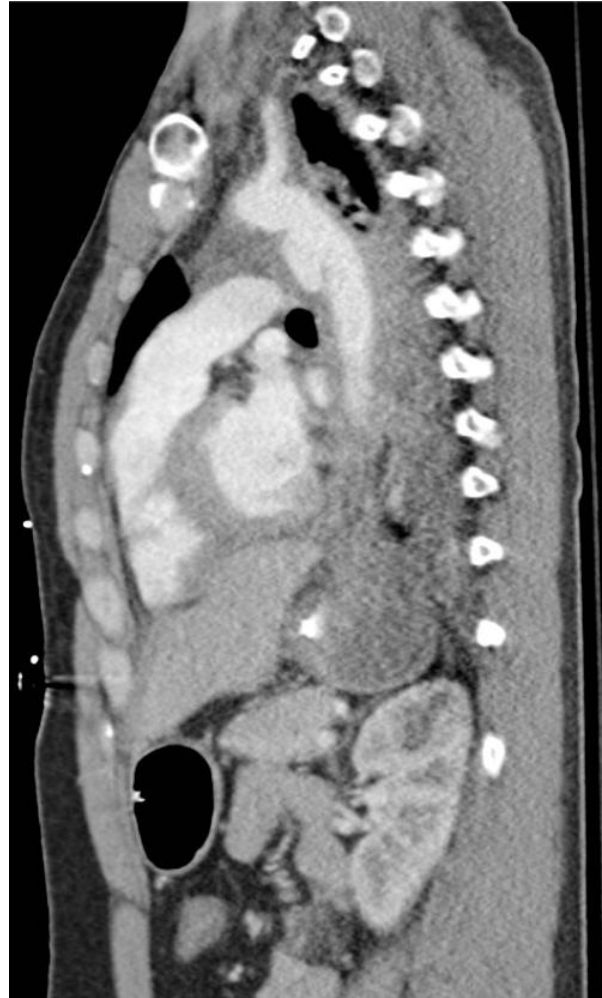
Fractures of the bilateral superior and inferior pubic rami = [open book pelvic fracture](#)

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**

Chart # 6



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

- Birchard KR, Busireddy KR, Semelka RC. Critical Observations in Radiology for Medical Students. John Wiley & Sons; 2015.

Welcome to the UNC Radiology Residency Education Website!

UNCRADRES

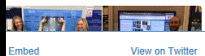
Tweets by @UNCRadRes

UNC Rad Residency
@UNCRadRes
Neuroradiology resident field trip to the art museum to check out the beautiful brain art. #RadioActivity @THHMD @DavidMauroMD @SJordanMD



Mar 28, 2019

UNC Rad Residency
@UNCRadRes
We had a blast presenting all of our work at #IRATX19! Thanks to @UNCRadiology for the opportunity. #RadioActivity @BDixonMD @JessieStewartMD @mcreamy @CharlesBurkeMD @SJordanMD @THHMD



Embed View on Twitter

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

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

ABR Core exam intel

Block 10 Schedule

Chief's Survey

RadExam

RSNA Physics Modules

UNC Radiology Conference schedule 18-19

Today	March 2019	Print	Week	Month	Agenda	
Sun	Mon	Tue	Wed	Thu	Fri	Sat
24	25	26	27	28	Mar 1	2
	7am Cardiac Cases - 12pm Body: US Reni	7am Hot Seat - Phys 12pm Health Care Ec	7am Hot Seat - Phys 12pm Neuro - Pediat			
3	4	5	6	7	8	9
	12pm Body: Modern 12pm VIR: Yu - Dial)	7am Hot Seat - Whit 12pm Peds Interacti	7am Hot Seat - Whit 12pm MSK: Maetani			
10	11	12	13	14	15	16
	7am Chest Cases - E 12pm Body: HSG - C	7am Hot Seat - Phys 12pm Body: Solid an	7am Grand Rounds - 12pm NH: Oldan - N			
17	18	19	20	21	22	23
	12pm Body: MRI/MR 12pm VIR: Dixon - R	7am Hot Seat - Core 12pm Peds: Fordhan	7am Hot Seat - Core 12pm MSK: Nissman 12pm MSK: Robert J			
24	25	26	27	28	29	30
	7am Chest Cases - E 12pm Body: US Live: 8am CVI Family Med	7am Hot Seat - Core 12pm Fellow Panel: 12pm Breast - Fell	7am Hot Seat - Core 12pm Cardiac: Hyslop			

Home



Welcome to our UNC Medical Student Radiology website!

Custom built HSL website for Radiology - e-Anatomy, UpToDate, PubMed and reference books

UNC Radiology Teaching Files

URMC Radiology Teaching Files

ACR Appropriateness Criteria: What Test Applies?

Department career goal advisers are available to counsel radiology-bound students!

RADY Formal Didactic Curriculum

Today	February 2020	Print	Week	Month	Agenda	
Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	31	Feb 1
	10am RADY 401 Cas 2pm Best of Breast 11pm Meet Aunt Minn				TEC Block 11 Ends	10am RADY 401 Fine
2	3	4	5	6	7	8
	TEC Block 12 begin	RADY Symposium	1pm Intro to Cardiol	1pm CXR Unknowns		
9	10	11	12	13	14	15
	1pm Intro to Abdom	RADY Symposium	8am Intro and Apprc	1pm Intro to Muscul	10am RADY 401 Mid	
	2pm Approach to the	8am Cervical spine E		2pm Radiologic Evali		

More at www.rads.web.unc.edu www.msrad.web.unc.edu

and @UNCRadRes

Thank you!



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