

Transitions

Basic Guide to Transitioning from the Classroom to
the Hospital Wards

Before You Begin

This module is intended primarily for ***pre-clinical medical students*** about to start their clinical years.

Please note that this module is not necessarily specific to radiology/imaging, but rather addresses general undergraduate medical education.

If material is repeated from another module, it will be outlined as this text is so that you are aware

Module Objectives

- Discuss the role of the medical student - *as they integrate with their provider teams*
- Outline differences in the general expectations - *as medical students now in clinical roles*
- Introduce methods to contribute to patient care - *as medical students hope to impress their peers and seniors*
- Introduce how students can integrate radiology - *as they navigate the core rotations*

Role of the Clinical Medical Student (traditionally “MS-3”)

- During their time on the wards, medical students are hoping to integrate with:
 - Attending Physicians
 - Resident Physicians
 - Allied Health Staff
 - Peers
- In an inpatient setting, generally medical students are assigned 2-4 patients that they will follow concurrently, from admission to discharge

Role of the Clinical Medical Student (continued)

- While the specifics clearly vary by institution, overall similarities are consistent. Clinical medical students are generally expected to:
 - **Pre-round on their patients**
 - Before or along with residents, students should visit their patients in the morning, perform a pertinent physical exam, and assess new lab results/imaging
 - **Be identified as lead trainee when presenting “their” patients on rounds**
 - This is a learning opportunity, where attending physicians can comment on the events and critique a student’s assessment and plan

Role of the Clinical Medical Student (continued)

- Clinical medical students are generally expected to:
 - Write notes in the electronic medical record (EMR) outlining their patients' status and care plan for the day
 - Medical students may also find value in asking residents or attendings to review these notes with them
 - Team approach - Assist the members of the care team with whatever tasks may be needed to potentiate patient care
 - This may involve assisting with a procedure, calling consultants and conveying the team's clinical question, or even simply sitting down with a patient and outlining the team's plan in greater detail



This is where medical imaging and awareness of radiology options/reports can be deployed!

Change in Expectations

- During the pre-clinical years, medical students are largely responsible only for their own education
 - Many medical schools are shifting away from formal required lectures, allowing pre-clinical students to work through material at their own pace and according to their own schedule
- In stark contrast, clinical medical students are responsible for both their continued education and the empathetic and appropriate care of their patients
 - Often times, students will need to align their schedules with that of the specific team in which they are placed

Expectations

- A clinical medical student should:
 - Show up ahead of group rounds (if inpatient) or clinic (if outpatient)
 - Consider arriving >30 minutes early to ensure adequate time for pre-rounding.
You hope to appear seamless in your preparation
 - Dress professionally
 - Review specific institutional requirements
 - Identify specific modifiers (i.e. when scrubs are appropriate)
You don't wish to stand out or attract negative attention
 - Treat all members of the team and patients with respect
 - Remain in the hospital until all their work is completed for that day –
Remember this is a "team sport"
 - Read up on their patients' pathophysiology
 - Consider review of specialty specific educational text/web resources
 - Follow institutional guidelines with respect to conflict management and mistreatment reporting

The “Honors” Medical Student

- While various medical schools have their own unique grading systems, a medical student generally must excel to earn the highest grade.
- The “Honors” medical student models behaviors that *optimize the care they provide* to their patients:
 - Never exaggerate or expect credit for work not performed
 - It is completely acceptable and expected for all students to make mistakes.
 - Ex. Do not attempt to present physical exam findings not performed, or an action which may compromise patient care.
 - As aforementioned, treat all members of the team and patients with respect and empathy

The “Honors” Medical Student

- Below are more practices that can help a clinical student shine while optimizing the care they provide to their patients:
 - Listen to all team members – respect what each can bring to the group.
 - Team synergy is critical to ideal patient care
 - Take ownership of your patients
 - *Reviewing your patients’ imaging is an excellent contribution*

Taking Ownership of a Patient's Care: Imaging

- As aforementioned, one of the best ways to contribute to a care team is to know the ins and outs of current and future imaging studies:
 - *Be ready with reports and image understanding – VISIT your radiologist in advance to learn what you can report later to your team*
 - *Review the ACR appropriateness criteria – Knowing when and which study to order is a critical skill that can drive the direction of patient care*

The “Honors” Medical Student

- Take ownership of your patients (continued)
 - Volunteer or seek additional care role for the team’s patients
 - If a procedure is being performed, or a patient with a particularly interested presentation is admitted, consider volunteering to assist
 - Be aware of the whole scope and breadth of care within the specialty
 - Invariably, the clinical wards alone will not impart all the knowledge a student needs to succeed (both in terms of clinical skills and test [i.e. SHELF] performance)
 - Students should use their free time to refer to primary texts and other educational resources that cover all specialty relevant topics

Reviewing relevant radiology resources is an excellent way to learn and helps integrate disease/pathology with patient care. ***Again, it can also launch conversation and impart knowledge – not always known to the team!***

The “Honors” Medical Student

- Below are some more practices that can help a clinical student shine while optimizing the care they provide to their patients:
 - Speak up and participate!
 - The best way to contribute to patient management and enhance one’s own education is to participate in all team discussions
 - Never be afraid to ask a question!
 - *A strong command of imaging can provide excellent avenues to contribute to discussions* (all within the skills outlined above)
 - Potentially present a topic of interest
 - Many medical providers, even senior physicians, can benefit from a brief but targeted/concise review of specialty relevant topics.
 - Ex. A group of obstetricians may benefit from a review of the ACOG imaging guidelines. Medical students should consider volunteering to present on a topic if time allows.

Integrating Radiology Learning

- The vast majority of medical students will not become radiologists. However, imaging skills and ordering are pertinent to all specialties.

Research has demonstrated that young residents in all specialties have below-expected imaging related skills.

This includes image interpretation and ordering

- Medical students can be first to see new imaging results. Instead of simply reviewing the radiologist dictation and summary, students should review the imaging themselves AND review with the radiologist when possible to further enhance their (and their team's) understanding!

This will not only impress the care team on rounds, but also develop the student's ability to detect pathology on an imaging study.

“Bread and Butter” Imaging Review

The following slides present a handful of common cases, requiring diagnostic imaging, students may encounter during the core rotations. Consider reviewing the “Introductory Case” modules in the anatomy section for an expanded case list.

This brief review is designed to introduce pre-clinical students to general patient work-up while simultaneously reviewing pathology that may assist in their transition to patient care.

Patient Presentation - HPI

“A 72 year old male is brought into the ED by his nursing home staff due to chief complaint of chills and fever ($T_{\max} = 103.4^{\circ}\text{F}$) persisting for at least one week. The patient also endorses a concurrent cough productive of dark green sputum. He endorses multiple sick contacts at his nursing home, but denies recent travel.

The patient’s PMH is notable for peripheral artery disease, persistent atrial fibrillation, and diabetes mellitus type 2, all well controlled with medication.

Vitals on exam are notable for temperature of 101.6°F , but otherwise wnl; Physical Exam is notable for rales in the lower left lung field.”

“Concerned with this clinical presentation, the ED physician orders a CXR, shown to the right.”

What is the diagnosis?

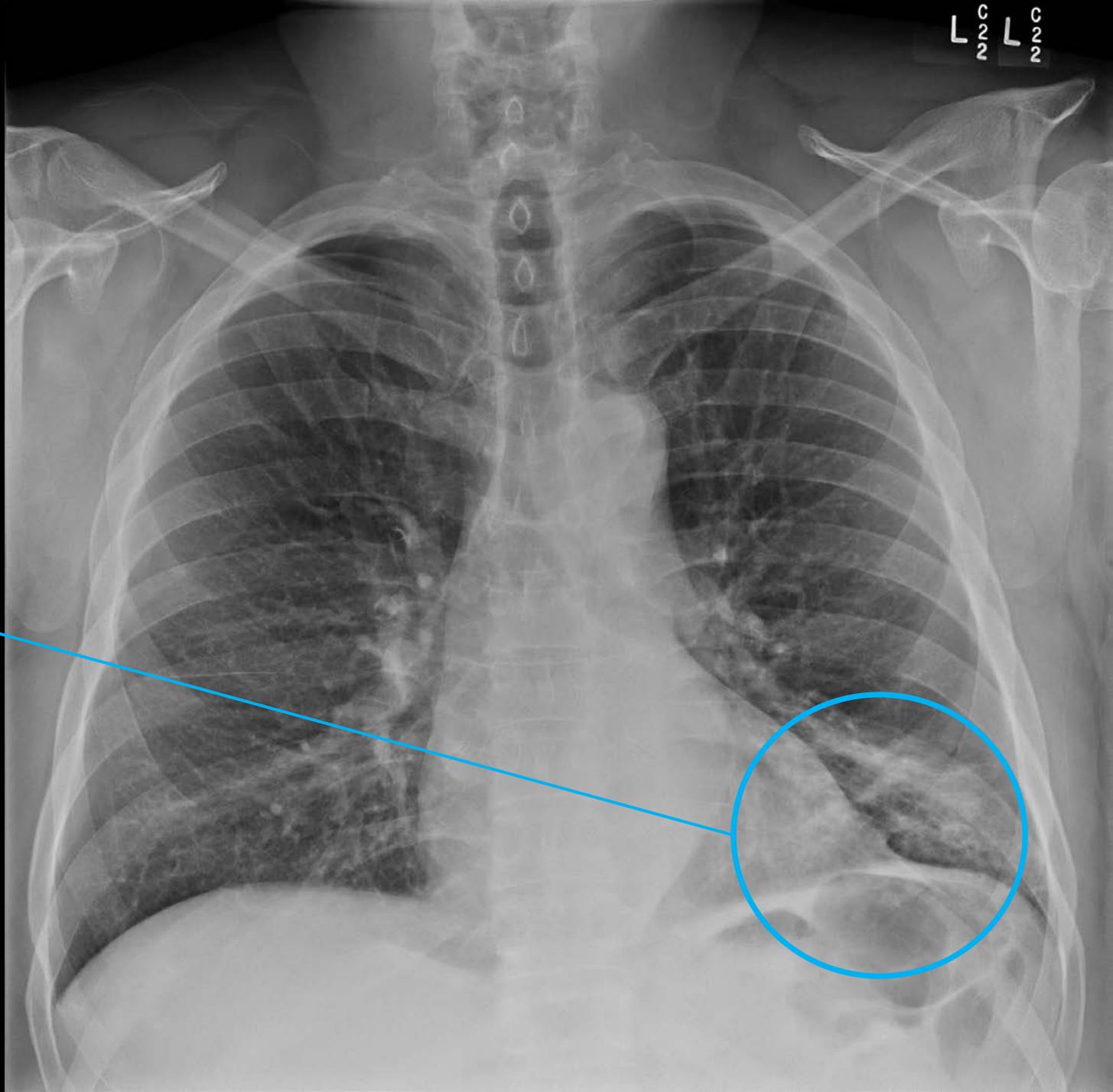


Diagnosis:

Pneumonia

Note the infiltrate in the left lung consistent with pneumonia.

This is most likely a consolidation in the left lower lobe given the distinct cardiac margin.



Diagnosis: Pneumonia

(Likely to encounter on Family Medicine or Internal Medicine Rotations)

- Pneumonia is usually an infectious process that impacts the alveoli of the lungs
 - The infection can be viral, bacterial, or fungal in nature
 - Some patients may have no symptoms; others can present with symptoms such as:
 - Productive Cough
 - Chest Pain
 - Chills/Fever
- On CXR, the pus generated by the infection appears as a consolidation, providing diagnostic clues
- Older patients, such as the one in this case, are particularly at risk of mortality from pneumonia

Patient Presentation - HPI

“An unresponsive 28 year old male is brought into the ED by EMS services. The patient is accompanied by his mother, who reports that the patient was eating a meal when he suddenly complained of debilitating chest pain, subsequently losing consciousness.

The patient does not have a significant PMH. His mother does report that the patient was experiencing hoarseness for the past few months, ascribed to GERD by his PCP. He was taking OTC omeprazole PRN as a result.

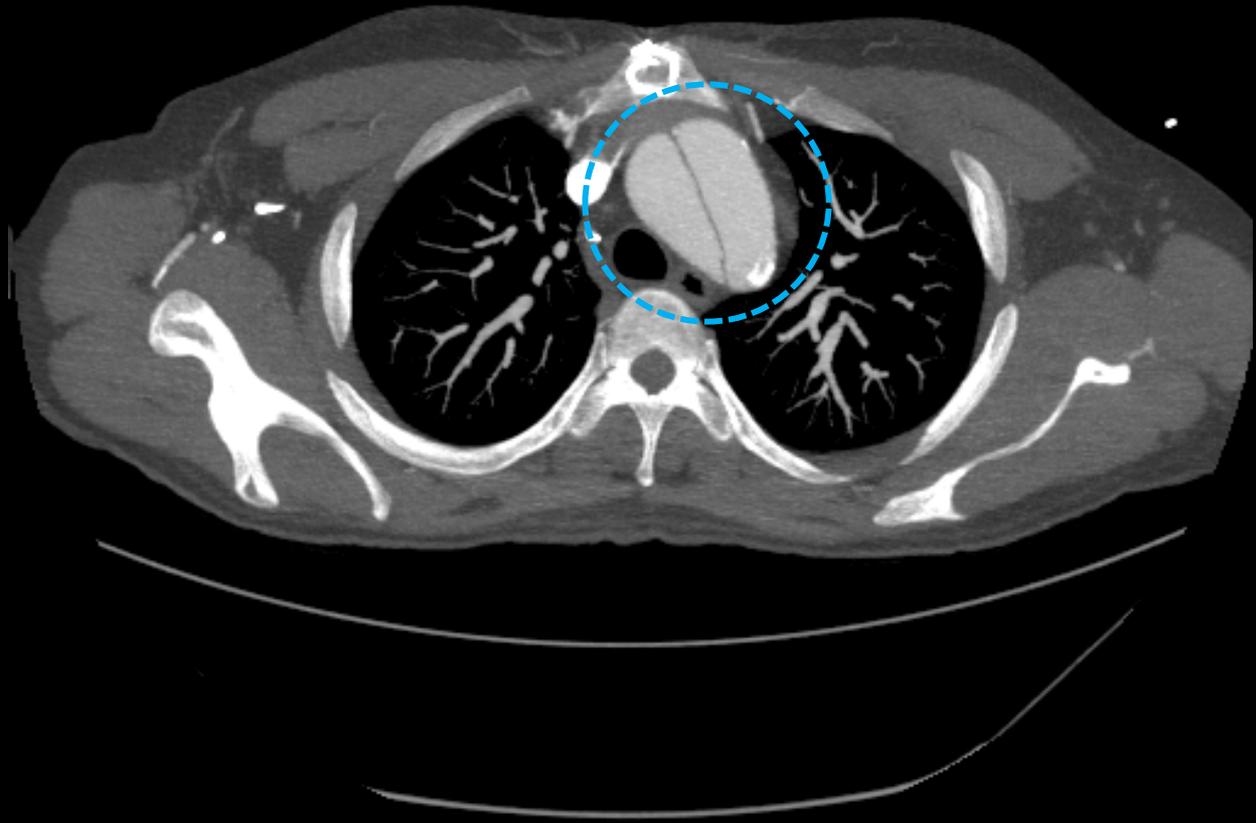
The patient’s family history is notable for a father that passed away suddenly at the age of 35 due to ‘heart problems.’

The patient’s vitals are notable for a BP of 80/50, as well as a HR of 145 bpm. GCS on admission was 5. Physical exam is notable for tall stature.”

“In the ED, the patient receives a chest CT w/ contrast”

A single axial cross-section from this CT is shown to the right.

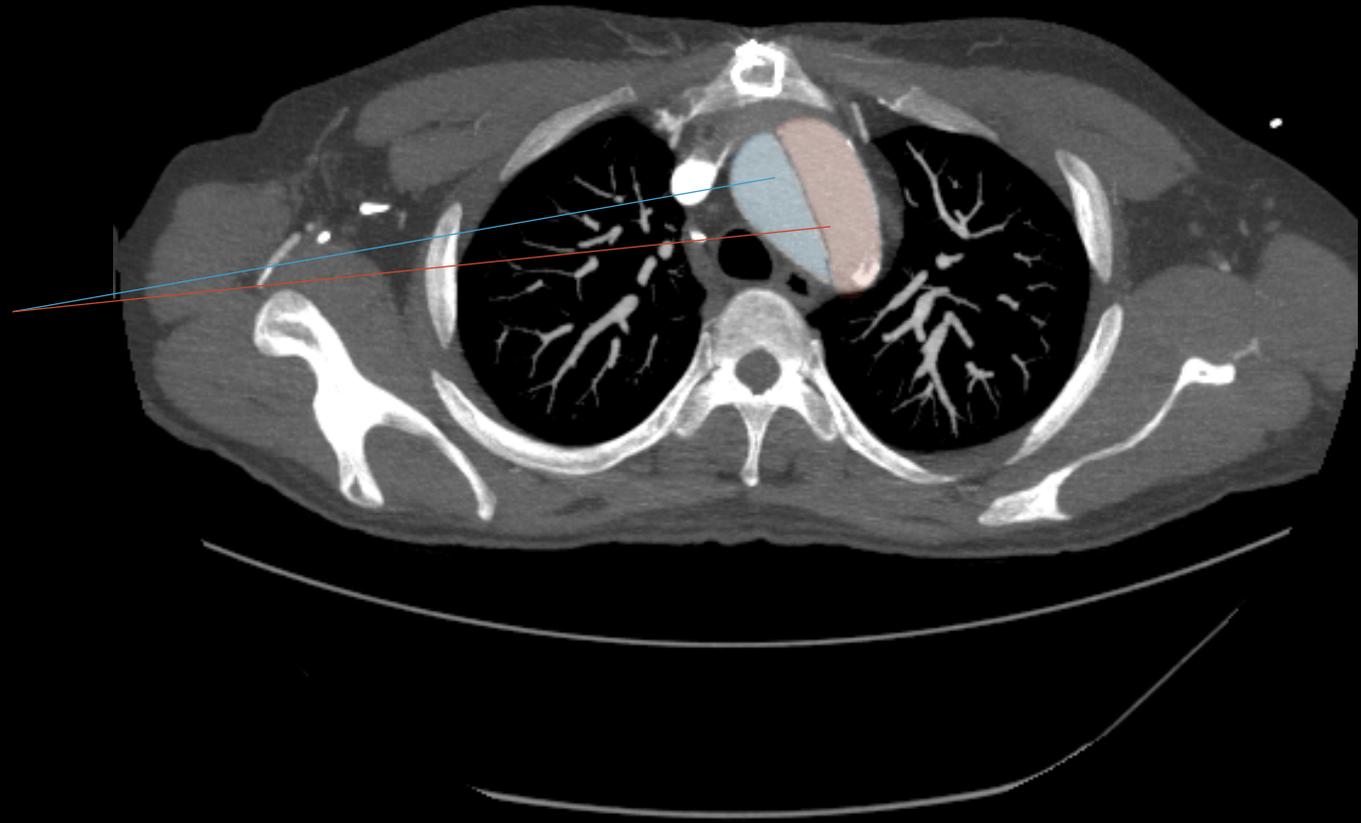
What is the diagnosis?



Diagnosis:

Thoracic Aortic Dissection

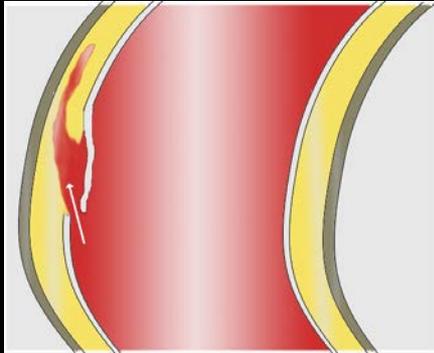
In the axial CT cross-section, note the enlarged aorta with two separate lumen, separated by an intimal flap



Diagnosis: Thoracic Aortic Dissection

(Likely to encounter/review during the Surgery Rotation)

- Aortic dissections occur when the intima of the aorta separates from the underlying aortic layers, creating a separate “lumen” for blood to flow into:



- Aortic dissections are medical emergencies, with high morbidity/mortality rates even after timely intervention
- A variety of conditions, such as connective tissue disorders, can predispose individuals to these dissections
- In this particular case, the patient’s family history of early cardiac death and tall stature could suggest a diagnosis of Marfan’s Disease
 - The fact that the patient was suffering from hoarseness for a few months could be indicative of an expanding thoracic aortic aneurysm that now ultimately dissected

Patient Presentation - HPI

“A 44 year old G0P0 female presents to the ED with chief complaint of significant right-sided back pain that began the day prior. The patient also endorses dysuria with blood in the urine. She denies any recent trauma.

The patient has no PMH, and is not currently taking any medication.

Vitals on exam are wnl; Physical exam is notable for tenderness to palpation of the right lower back, at the costovertebral angle.”

“The ED Physician orders a supine abdominal radiograph, shown to the right.”

What is the diagnosis?



Diagnosis:

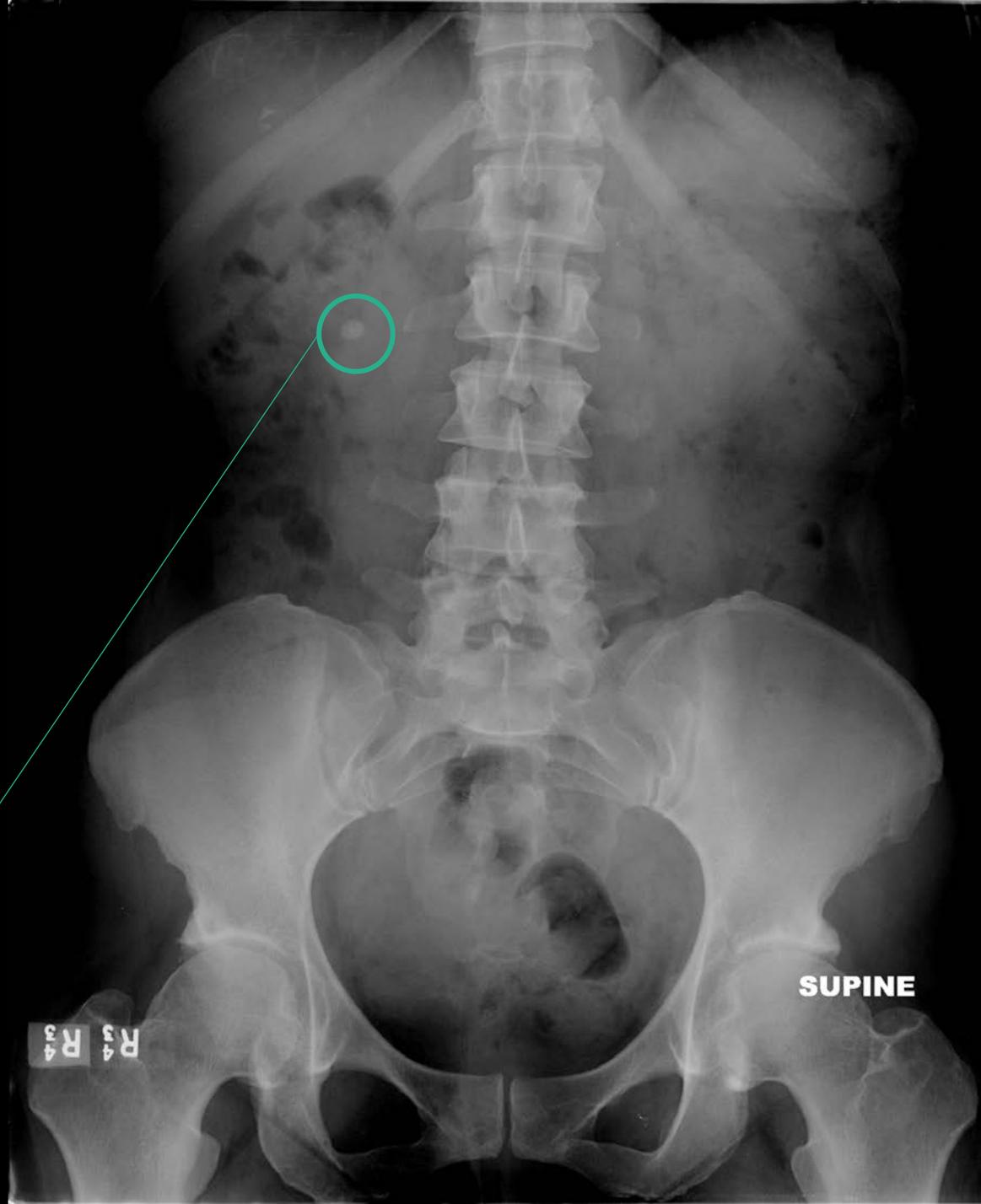
Nephrolithiasis

(Likely to encounter on ED or Surgery rotations)

Kidney stones are calculi that can obstruct the outflow of urine from the kidneys, leading to potential complications such as pyelonephritis and even systemic infection.

While some kidney stones may pass naturally, others require surgical intervention.

Note the opacity in the right upper quadrant indicative of a renal calculi. Not all kidney stones are radiopaque.



Patient Presentation - HPI

“A 72 year old male presents to the ED with chief complaint of gross hematuria. He reports noticing pink discoloration of his urine intermittently in the past few months, but denies any dysuria. He denies recent illness or trauma, but endorses unexplained weight loss of approximately 10 lbs. over the past two months.

The patient’s PMH is significant for type 2 diabetes mellitus, well controlled with metformin 1000 mg QD. The patient recently discontinued smoking, but has a 55 pack-year history.

The patient’s family history is notable for a father who passed away from lung cancer of an unspecified type.

Vitals on exam are wnl; Physical exam is notable for crackles in the inferior lung fields bilaterally, but otherwise wnl.”

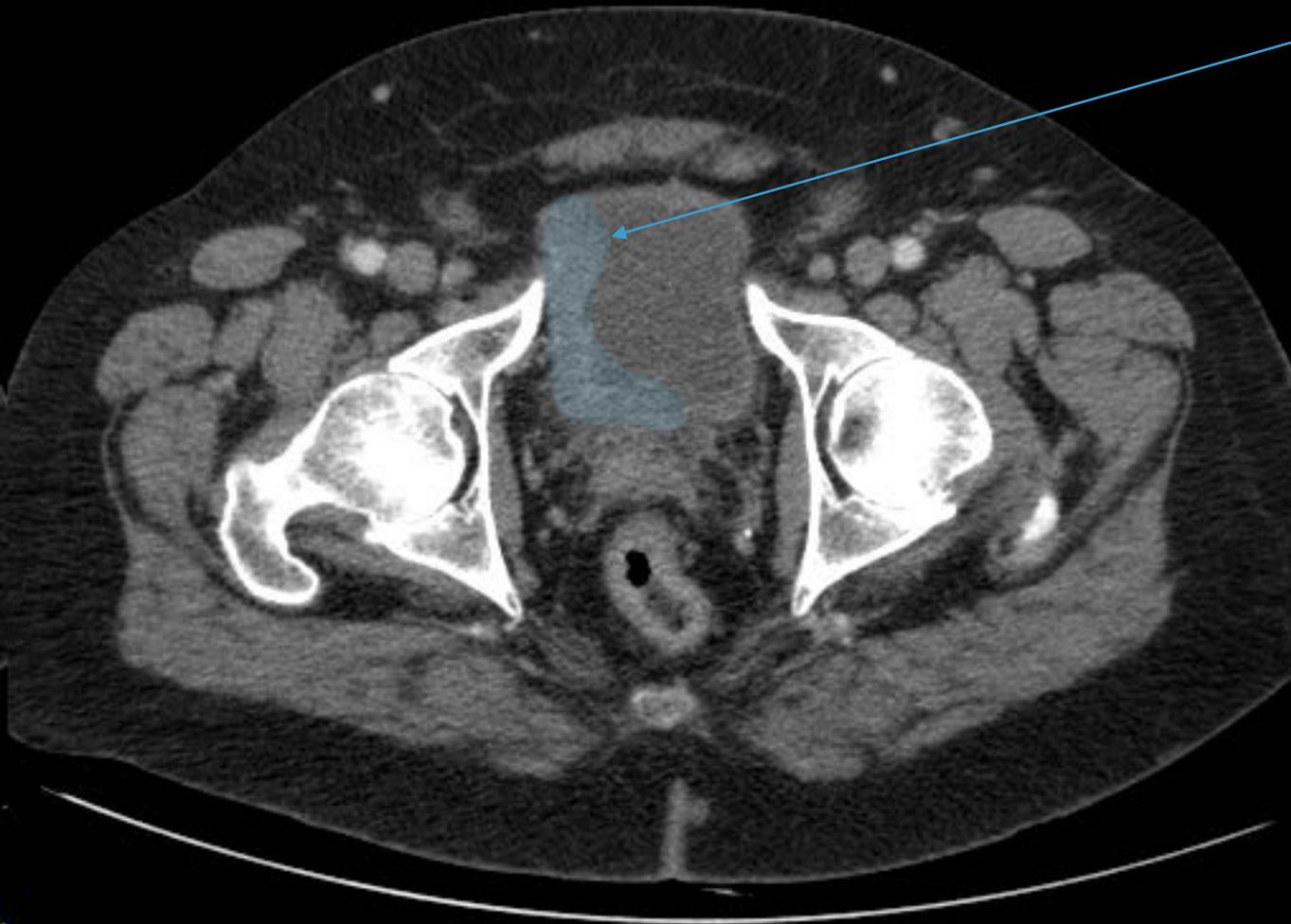
“Concerned with this clinical presentation, the ED physician orders a CT pelvis. An axial cross-section from this study is shown the left.”

What is the most likely diagnosis?



Diagnosis: Suspected Bladder Cancer

Note the abnormal and asymmetric thickening of the bladder wall, consistent with a neoplastic process. A biopsy (usually via cystoscopy) is required to confirm a diagnosis of malignancy.



Diagnosis: Likely Bladder Cancer

(Likely to encounter during the Ob/Gyn rotation)

- Bladder cancer involves neoplastic proliferation of cells in the bladder, and comes in numerous types
 - Biopsy (usually via cystoscopy) of the mass is required to determine the specific diagnosis
 - While most tumors of the bladder are malignant, this is not always the case
- Symptoms of bladder cancer may include:
 - Hematuria
 - Dysuria and/or change in urination frequency
 - Generalized symptoms of malignancy (i.e. weight loss, pain)
- While we cannot definitively diagnose the patient in this case with a malignancy using imaging alone, the clinical presentation (i.e. unexplained weight loss, risk factors such as smoking history and age) makes malignancy more likely than a benign process

Patient Presentation - HPI

“A concerned mother brings her 19-month old son into the pediatric ED. She reports that as of yesterday afternoon, he had spiked a fever of 103.1 °F and wouldn't stop drooling. Moreover, she noticed him intermittently turn blue while sleeping on his back overnight.

The patient does not have a significant PMH. He was born at term without complications. However, he has not received any vaccinations due to parental refusal.

Vitals on exam are significant for a temperature of 102.1 °F; physical examination is notable for general malaise, significant drooling, and inspiratory stridor.”

“The pediatric ED attending physician orders a lateral C-spine radiograph, shown below.”



What is the diagnosis?

Diagnosis: Epiglottitis

(Likely to encounter during the Pediatrics Rotation)

- Epiglottitis is an inflammation of the epiglottis, usually due to an infectious process
 - One of the most common causative organisms is *H. influenzae*
 - According to the CDC, with the advent of the Hib vaccination, epiglottitis rates have reduced drastically within the pediatric population
 - However, in this case, this child is not vaccinated
- Epiglottitis is considered a medical emergency given its potential to compromise a patient's airway

Diagnosis: Epiglottitis



Note the thickening of the epiglottis caused by inflammation. This is commonly referred to as the "Thumb Sign" given its appearance similar to a thumb

Conclusion

- The transition from pre-clinical to clinical time can be challenging, but many find the shift rewarding as they contribute directly to patient care
- Clinical medical students should be identified as the “lead trainee” responsible for the care of their assigned patients
- Throughout their time on the wards, students should aspire to be a model of professionalism

Conclusion

- A superlative (“honors”) medical student:
 - Always takes ownership of their patients
 - Is punctual at all times
 - Respects the thoughts and opinions of all those around them
 - Volunteers whenever possible
 - Speaks up and participates during rounds
 - Reads regularly to stay up-to-date on their patients’ pathophysiology and treatments

Conclusion

- Students can greatly assist their teams by thoroughly reviewing and understanding their patients' imaging studies
 - Visiting the reading room and reviewing the ACR appropriateness criteria are great ways to accomplish this

END