

## Academic Half Day: Sepsis

1:00-1:15	Theory Burst
1:15-2:05	Case
2:05-2:15	Break
2:15-2:25	Questions for the expert
2:25-2:45	Group Lit Review Part 2
3:45-3:20	Case
3:20-3:30	Questions for the expert

*While you are waiting for half-day to begin, please fill out the chart below with appropriate arrows (up, down, or equivocal):*

	Preload	Pump	Afterload
	PCWP	CO	SVR
Hemorrhagic			
Cardiogenic			
Septic			

### **CASE: You are seeing a patient previously admitted to the floor**

78 y.o. male with a PMH significant for HTN, HLD (on atorvastatin), HF rEF (LVEF of 40-45%, on metoprolol and losartan), type 2 DM (on metformin only), obesity, anemia of chronic disease, metastatic prostate cancer (well controlled with androgen deprivation therapy), and dementia who was admitted 24 hours ago due to failure to thrive. A nurse calls you to bedside to assess altered mental status and abnormal vitals (listed below). Prior to admission, the patient lived with his wife, who helped with ADLs. His wife is at bedside now and reports that for the past several days he has had a productive cough with yellow sputum. He now demonstrates some signs of shortness of breath. He also endorses chills and mild nausea. Denies headache, photophobia, neck stiffness, chest pain, abdominal pain, vomiting, diarrhea, dysuria, hematuria, joint swelling, or skin rashes/lesions. He has not required hospitalization or IV antibiotics within the past year.

Bedside evaluation reveals the following:

Vitals: Temp = 96.5 F, BP = 89/50 mmHg (MAP = 63 mmHg), HR = 98/min, RR 26/min, and SpO<sub>2</sub> 92% on 2 L of O<sub>2</sub>.

Exam: Patient is lethargic. He is oriented to person, but not place or time (previously oriented to person and place). He is able to answer simple questions and follow one-step commands. No focal neurologic deficit is appreciated. Mucus membranes are dry. Auscultation reveals borderline tachycardia with no murmurs/rubs/gallops, crackles in the left lung base, and decreased bowel sounds. Abdomen is soft, non-distended, and non-tender with no masses or organomegaly. Skin is warm, flushed, and moist. No rashes or wounds are noted.

**1. Are you worried about sepsis in this patient? Why?**

- a. What are the definitions of sepsis and septic shock? What is the pathophysiology of sepsis?
  - i. What scoring system is used to define sepsis by the 2016 Surviving sepsis Guidelines?
  
- b. What factors increase this patient's risk for sepsis?
  
  
  
  
  
  
  
  
  
  
- c. What decision tools can help with sepsis identification and risk-stratification?
  - i. Should sepsis identification rely on any single scoring tool?



- d. What is our patient's diagnosis?

**2. You begin writing orders. The patient's wife makes it clear that he should remain full code. What level of care do you anticipate? What labs do you want to order?**

- a. Disposition/Level of Care?
  - i. Consider using a pneumonia scoring tool discussed at last week's AHD in addition to a sepsis scoring tool.
  
  
  
  
  
  
  
  
  
  
- b. What labs and/or imaging would you order?

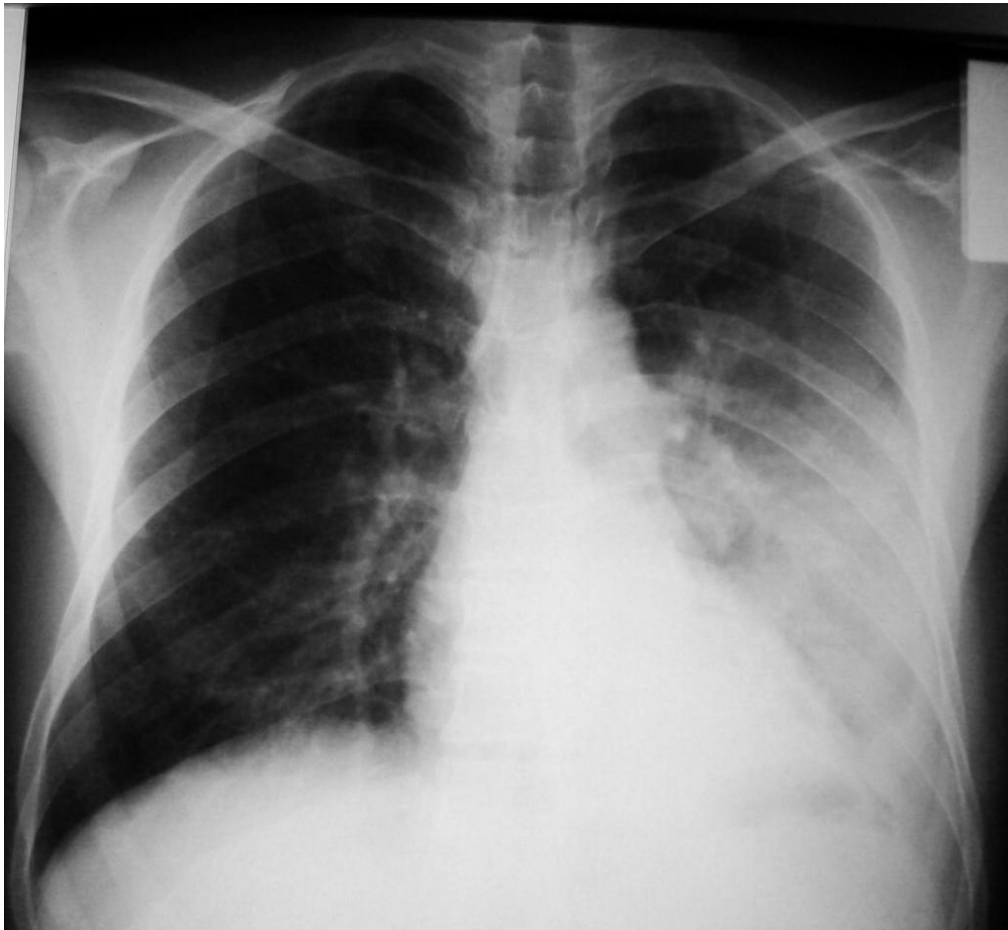
## CASE: Continued...

### Labs:

- CBC: WBC = 14,000, Hgb = 9.5, Hct = 32, Plt count = 120,000
- Renal: Na = 142, K = 3.8, Cl = 105, Bicarb = 12, BUN = 40, Cr = 1.5 (baseline 1.1), glucose = 210
- LFTs: AST = 35, ALT = 42, Alk phos = 120, total bilirubin = 1.1
- ABG: pH = 7.24, pCO<sub>2</sub> = 28, pO<sub>2</sub> = 68
- Lactate = 4.2
- Procalcitonin = 0.6
- Blood cultures = pending
- UA = spec gravity = 1.035, glucose = 0 mg/dL, protein = 100 mg/dL, ketones = 0 mg/dL, WBC = 2, RBC = 0, leuk esterase = negative, nitrite = negative, bacteria = none

### Imaging:

- CXR:



**3. Calculate patient's SOFA score. Determine his acid-base status.**

a. SOFA

b. Acid-Base Status

**4. What is the utility of procalcitonin?**

a. In sepsis treatment initiation?

b. In de-escalation of antibiotics?

**5. After calling a rapid, the patient is transferred to the MICU. What is your initial resuscitation plan?**

a. Access?

b. Monitors?

c. What is the goal time for administration of antibiotics?

i. Discuss changes in the 2021 Surviving Sepsis Guidelines.

- d. What factors influence your choice of antibiotics?
  
- e. What antibiotics does this patient need?
  
- f. How much fluid should be given?
  - i. Discuss changes in the 2021 Surviving Sepsis Guidelines
  
- g. What kind of fluid?

**6. How will you assess for fluid responsiveness? Should we assess fluid responsiveness before giving 30 mL/kg of crystalloids?**

- a. What strategies/tools can be used to gauge fluid responsiveness prior to administering large-volume fluids boluses? What are some static measures of fluid status and what are some dynamic measures?

**BREAK (please regroup at 2:15 PM; type any questions you have for the expert into the chat box)**

**7. Mini Literature Review**

- a. **Instructions:** Briefly look up 1-2 of the following studies and summarize for the group.
- b. **Rivers (2001):**
  
- c. **ARISE (2014):**
  
- d. **PROCESS (2014):**

- e. **PROMISE (2015):**
  
- f. **PRISM (2017):**
  
- g. **TRISS (2014):**
  
- h. **ALBIOS (2014):**
  
- i. **SMART-MED (2018):**
  
- j. **SOAPII (2010):**
  
- k. **VASST (2008):**
  
- l. **SEPSISPAM (2014):**
  
- m. **CORTICUS (2008):**
  
- n. **ADRENAL (2018):**
  
- o. **NICE-SUGAR (2009):**

### **CASE: Continued...**

The patient shows no improvement despite aggressive IVF resuscitation and antibiotics. He requires intubation in the MICU for worsening respiratory failure. Central venous and radial arterial lines are placed for administration of vasopressors and hemodynamic monitoring. There is no change in pulse pressure (e.g. cardiac output) based on proprietary Vigileo algorithms with a passive leg raise. Despite receiving a total of 5 liters of LR, patient's MAP remains below 65 mmHg with a lactate of 4.1 and urine output of 10 mL/hr.

**8. What does this patient have now?**

- a. What objective data can we follow to capture worsening sepsis?

**9. What is the next step?**

- a. What is our MAP goal? If you're called to the bedside of a patient how can you quickly calculate a patient's MAP in your head using their SBP/DBP?
  
- b. Which vasopressor(s)?
  - i. Of the common vasopressors, what cellular receptors are primarily acted on? What are the primary adverse effects?

**10. Despite max pressor support, patient continues to be hypotensive with little UOP, what is a possible next step?**

- a. Reassess diagnosis?
  
  
- b. Corticosteroids?
  
  
- c. Should we do ACTH stim first?

**11. After starting steroids, the next two FSBS levels are 260 and 285. What is your next course of action?**

- a. Glucose target?

**BREAK (please regroup at 3:20 PM; type any questions you have for the expert into the chat box)**