

## Disclaimer

### Acute Care & Critical Care Case-Based Reviews

Acute Infectious Diseases & Gastrointestinal Disorders

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## Introduction



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## Agenda

- Cases 1-4
  - 2 Cases in ID
  - 2 Cases in ID/GI
- ACEP Clinical Policy Reviews
- A special coupon code & Feedback
- Live Q&A

## Integrated Case-Reviews

- Case 1 -



## Case 1

- 57-year-old female with a PMH of COPD, HTN, DM2, hypothyroidism comes in with a worsening productive cough, SOB, DOE, and fever.
- Her symptoms started 3 days ago.
- She denies the use of supplemental O2 at home, has been admitted to the hospital before for pneumonia 2 years ago, and reports feeling the same.
- Denies any chest pain/pressure, N/V/D, rash, but has indigestion.
- Reports NKDA. She still reports smoking 1 ppd.
- Current medications include:
  - Breztri (budesonide/glycopyrrolate/formoterol) bid, albuterol nebs prn, losartan, HCTZ, insulin aspart +insulin glargine, levothyroxine



## Case 1

- VS:
  - Temp = 101.2, P = 105 bpm, BP = 91/42 (58), RR = 24, O<sub>2</sub>Sat = 88% (RA) that corrects to 93% on 2 L per NC
- Physical Exam:
  - Gen: Awake/alert but ill-appearing. Answers most questions in short phrases and pursed-lipped breathing
  - Pulm: Moderate respiratory distress, accessory muscle use, scattered expiratory wheezes bilaterally
  - CV: tachycardic, regular rhythm, no murmurs
  - GI: non-tender, non-distended.
  - Skin: Warm, dry, cap refill 3-4 sec

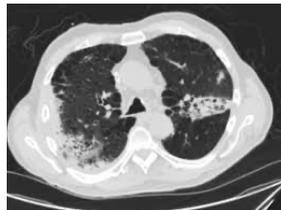


## Case 1

- What do we need to order or do next?
  - It helps us to rule in & out our differential dx
    - EBM Core Concepts: Sensitivity, Specificity, PPV, NPV, LR
- Differential Diagnosis:
  - COPD exacerbation
  - Community-Acquired Pneumonia
  - Viral infection (Flu, COVID, other)
  - Sepsis / Septic Shock
  - \_\_\_\_\_
  - New onset HF
  - ACS (NSTEMI/STEMI) → \_\_\_\_\_
  - DKA? → \_\_\_\_\_ → low BP, elevated pulse?



## Case 1



## Case 1

- Chest radiograph = \_\_\_\_\_
- Labs:
  - WBC = 16.4, H/H = 13.1/39
  - Na = 132, K = 4.3, BUN = 31, Cr = 1.3, Gluc = 227
  - Lactic acid = 3.5
  - SIRS = \_\_\_\_\_
    - SIRS + source of infection (lungs)
  - qSOFA = \_\_\_\_\_



## Case 1

- Does this patient meet the criteria for sepsis?
- Does the patient have septic shock?
  - If so, by what parameters?
- Should we order procalcitonin levels to determine if starting antibiotics is needed?
  - Controversial, but SSCM recommends \_\_\_\_\_



## Case 1

- Initial plan:
  - IV + Blood cultures asap
  - Empiric antibiotics ideally within 1 hour
    - Does this patient warrant coverage against Pseudomonas, MRSA and/or MDR organisms?
    - What about antifungal prophylaxis? → \_\_\_\_\_
    - What about antiviral prophylaxis? → \_\_\_\_\_
  - IVF with balanced crystalloid or 0.9% NS at 30 ml/kg
    - E.g., Lactated Ringer's, Plasma-Lyte
  - Goal MAP > 65 mmHg
  - Glucose control?
    - SSCM recommends insulin if > \_\_\_\_\_ mg/dl (QOE: Moderate; Strength: Strong)



## Case 1

- 3-hrs later (still in the ER)
  - Repeat lactate = 2.4
  - Average MAP 61-63 mmHg with SBP 93-100 mmHg
  - Flu & COVID tests = negative
  - Treatment plan adjustments:
    - Add vasopressor → norepinephrine which improves the MAP > 65, but patient's O2 need is increasing
  - Goal Disposition:
    - ICU admission within \_\_\_ hrs (SCCM QOE: Low; Strength: Weak)
    - Other treatment considerations:
      - VTE prophylaxis → \_\_\_\_\_ SCCM (QOE: Moderate; Strength: Strong)
      - Hydrocortisone therapy?
      - IV Vitamin C? → SCCM \_\_\_\_\_ (QOE: Low; Strength: Low)



## Integrated Case-Reviews

- What Does ACEP Recommend? -



## ACEP Clinical Policy Statements

- In the adult ER patient diagnosed with CAP, what clinical decision aids can inform the determination of patient disposition?
  - Level A Recommendations: None
  - Level B Recommendations:
    - The Pneumonia Severity Index (PSI) and CURB-65 decision aids can support clinical judgment by identifying patients at low risk of mortality who may be appropriate for outpatient treatment. Although both decision aids are acceptable, the PSI is supported by a larger body of evidence and is preferred by other society guidelines (ATS/IDSA 2019 guidelines).
  - Level C Recommendations:
    - In patients \_\_\_\_\_ receiving vasopressors or mechanical ventilation, use the 2007 IDSA/ATS Minor Criteria rather than mortality prediction aids such as the PSI or CURB-65 to help establish which patients are most appropriate for care based in an ICU setting (*Consensus recommendation*).
    - Do \_\_\_\_\_ routinely use biomarkers to augment the performance of clinical decision aids to guide the disposition of emergency department patients with CAP (*Consensus recommendation*).
    - Use CAP clinical decision aids in conjunction with physician clinical judgment in the context of each patient's circumstances when making disposition decisions (*Consensus recommendation*).



## ACEP Clinical Policy Statements

- In the ER patient with CAP, what biomarkers can be used to direct initial antimicrobial therapy?
  - Level A Recommendations: None
  - Level B Recommendations: None
  - Level C Recommendations:
    - Do NOT rely upon any current laboratory test(s), such as \_\_\_\_\_ and/or \_\_\_\_\_, to distinguish a viral pathogen from a bacterial pathogen when deciding on administration of antimicrobials in the ED.



## ACEP Clinical Policy Statements

- In the ED patient diagnosed with CAP, does a single dose of parenteral antibiotics in the ED followed by oral treatment versus oral treatment alone improve outcomes?
  - Level A Recommendations: None
  - Level B Recommendations: None
  - Level C Recommendations:
    - Given the lack of evidence, the decision to administer a single dose of parenteral antibiotics prior to oral therapy should be guided by the patient's risk profile and preferences (*Consensus recommendation*).



## Integrated Case-Reviews

- Quick Cases in ID / Antimicrobial Stewardship-



## Quick ID/AS Case 2.1

- 7-year-old F with no PMH who comes in with severe bilateral ear pain, fever, and nausea that started 3 days ago and is worsening.
- Denies a sore throat, cough, rash.
- Physical exam:
  - Ill-appearing, temp = 102.5, bil TM erythema, bulging. No perforation
  - What other exam finding is worth considering?
    - \_\_\_\_\_
    - What if recurring despite antibiotics? → \_\_\_\_\_



## Quick ID/AS Case 2.1

- Antimicrobial Stewardship Considerations for Acute Otitis Media (AOM):
  - When is watchful waiting appropriate?
    - 6 to 23 months old with non-severe, \_\_\_\_\_ AOM
    - ≥ 24 months old with non-severe, uni- or bilateral AOM
    - If no improvement, plan for antibiotics at \_\_\_\_\_ hrs
  - Our patient:
    - Has symptoms > 48 hrs
    - Those symptoms are severe + associated with nausea
    - Has a temp > 102.2



## Quick ID/AS Case 2.1

- Appropriate antibiotic selection for AOM:
  - Amoxicillin 80-90 mg/kg/d in divided doses 5-7 days for moderate infection and up to 10 for severe
    - If recent amoxicillin (~30 d) or failures with amoxicillin then switch to amoxicillin-clavulanate at \_\_\_\_\_ mg/kg/d
    - If vomiting or amoxicillin/clavulanate failure → ceftriaxone \_\_\_\_\_ mg/kg IM or IV x \_\_\_\_\_ days



## Quick ID/AS Case 2.2

- 32 yr old male with no PMH who comes in with 3 days of sinus pressure, and intermittent drainage, but no fever, HA, nausea, or vomiting.
- He says he normally needs antibiotics when it starts like this.
- He takes no other medications and denies smoking.
- Physical exam:
  - Non-ill appearing, afebrile, mild nasal congestion.
  - Ears: nml.



## Quick ID/AS Case 2.2

- What is the classification for acute bacterial sinusitis?

Classification	Description
Persistent	▪ ≥10 days of symptoms without improvement
Worsening	▪ Symptoms worsen after initial improvement
Severe	▪ ≥3-4 days with fever ≥102.2 with purulent nasal discharge or facial pain



## Quick ID/AS Case 2.2

- *Evidence Integration*
  - Cochrane Review of 10 trials assessed the risks and benefits of antibiotics for acute bacterial sinusitis
    - NNT=18 treated, 1 will be cured by 1-2 weeks
    - NNT=11 treated, 1 will have purulent nasal discharge resolution by 1-2 weeks
    - NNH=8 treated, 1 will experience harm
  - Conclusion: risks outweighed benefits



## Major Guidelines: Sinusitis

- IDSA
  - Infectious Diseases Society of America
- AAP
  - American Academy of Pediatrics
- AAO-HNS
  - American Academy of Otolaryngology-Head and Neck Surgery



CDC Antimicrobial Stewardship.  
\*MIPS (Merit-Based Incentive Payment System with CMS)



## Quick ID/AS Case 2.2

- Overview of AAP, AAO-HNS Recommendations on Observation
  - Observation if persistent symptoms ONLY
    - Adults: total 17 days
    - Peds: total 13 days
      - Both include initial \_\_\_\_ days of persistent symptoms (\*a MIPS measurement)
  - Begin antibiotics if there is no improvement by the end of the observation period, or if symptoms worsen

## Quick ID/AS Case 2.2

	Treatment Strategy for Bacterial Sinusitis
First-line (All)	<ul style="list-style-type: none"> <li>▪ Amoxicillin</li> <li>▪ Amoxicillin-clavulanate (per IDSA; MIPS)</li> </ul>
Second-line	<ul style="list-style-type: none"> <li>▪ Adults: doxycycline, levofloxacin</li> <li>▪ Peds: cefdinir, cefuroxime, cefpodoxime</li> </ul>
Duration	<ul style="list-style-type: none"> <li>▪ Adults                             <ul style="list-style-type: none"> <li>▪ AAO-HNS: x 5-10 days</li> <li>▪ IDSA: x 5-7 days uncomplicated; x 7-10 days patients w/ risk factors for resistance or non-responders</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>▪ Peds:                             <ul style="list-style-type: none"> <li>▪ IDSA: x 10-14 days</li> <li>▪ AAP: inadequate evidence</li> </ul> </li> </ul>

CDC Antimicrobial Stewardship.



## Mental Break

- Words Matter -



## Integrated Case-Reviews

- Case 3 -



## Case 3

- A 42-year-old male with a PMH of alcoholic cirrhosis comes in with generalized abdominal pain, abdominal distension, jaundice, and chills.
- Family reports he seems to be getting intermittently confused. His last drink was 3 hours ago.
- Current medications include:
  - Propranolol, spironolactone, furosemide, lactulose
- VS:
  - T = 100.8, P = 91, BP = 145/92, RR = 18, O2Sat = 96% on RA
- Physical Exam:
  - Awake and alert, but does appear intermittently confused.
  - No asterixis, but has scleral icterus, jaundice
  - Abd: Distended with +fluid wave, no caput medusae; generalized tenderness to palpation
  - Extremities: Bilateral 2+ PE to the hips → why?



## Case 3

### Work-up:

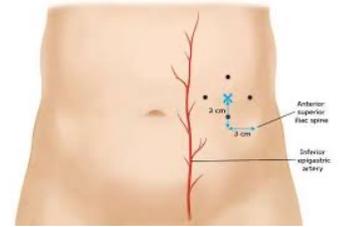
#### Labs:

- CBC with diff --> why?
- CMP → why not BMP?
- Lactic acid?
- Ammonia level
- Alcohol level → if so, why?
- Stool guaiac for occult blood?
- Ascitic fluid analysis

#### Imaging: CT brain?



## Case 3



## Case 3

### What should be ordered and evaluated on the ascitic fluid from the peritoneal tap?

#### Ascitic fluid analysis:

- SAAG: > \_\_\_\_\_ g/dL (or 11 g/L)
- Ascitic neutrophil count > \_\_\_\_\_ cells/mm<sup>3</sup>
- GS or C&S positive for pathogens
  - Collect using a sterile specimen cup or standard aerobic/anaerobic bottles
  - Obtain prior to the \_\_\_\_\_ of antibiotics



## Case 3

### Results:

- WBC = 13.1, H/H = 9.8/28, Plt = 88
- CMP = Na = 140, K = 4.1, BUN = 24, Cr = 1.1, AST/ALT = 124/131, Alb = 2.3
  - Why assess the BUN:Cr → our pts is 21.8
- Ascitic fluid: PMNs = 260, albumin = 1.0
  - SAAG = 2.3 – 1.0 = 1.3
- Ammonia level = 89



## Case 3

### Treatment options for SBP:

- Cefotaxime 2 g IV every 8 hours
  - Preferred by AASLD guidelines and most studied
- Ceftriaxone 2 g IV every 24 hrs
- Ertapenem 1 g IV every 24 hrs
- PLUS
  - Supplemental \_\_\_\_\_
    - 1.5 g/kg IV at diagnosis and then 1 g/kg on day 3

## Case 3

### Evidence Integration

- A meta-analysis of 4 trials (n = 288) without any evidence of heterogeneity or publication bias showed that giving albumin vs. no albumin resulted in:
  - Lower risk of \_\_\_\_\_ impairment (OR, 0.21, 95% CI, 0.11 – 0.42)
  - Reduced \_\_\_\_\_ (OR, 0.34; 95% CI, 0.19 – 0.60)

## Case 3

- Additional treatment considerations:
  - Paracentesis and prepare for long-term management
    - Why the spironolactone:furosemide regimen?
  - Lactulose 30 g PO to titrate to 2 to 3 loose stools per day
  - Monitoring parameters for ETOH withdrawal
  - Disposition?

## Integrated Case-Reviews

- Case 4 -



## Case 4

- A 10-year-old female with no PMH comes in with parents concerned about possible appendicitis after they googled their daughter's symptoms which include pain in the umbilical area that migrated to the right lower quadrant pain, nausea, + fever. Her pain worsened when going over speed bumps on the way here.
- Her symptoms started yesterday and have progressed.
- She denies any vomiting, dysuria, urgency or frequency of urination, rash, or prior surgeries.



## Case 4

- Vital signs:
  - T = 100.9, P = 110, BP = 127/76, RR = 18
- Physical exam:
  - Febrile, mild to moderate distress due to abdominal pain. Answers your questions
  - Rebound tenderness to the RLQ; + heel-tap pain; + psoas sign.
    - What is the name of the area in RLQ? \_\_\_\_\_ point
- Labs:
  - WBC = 15.2, Neutrophils = 83%, BMP = nml



## Case 4

- Imaging vs. immediate surgical consult?
  - Methods of imaging:
    - Ultrasound
    - CT
    - MRI
  - What about risk stratification tools?
    - Alvarado Score = 8 (probable appendicitis)
      - Is this valid in pediatrics?
    - PAS (Pediatric Appendicitis Score) = 9 (likely appendicitis. Consider surgical consult)



## Case 4

- Treatment plan:
  - IV
  - NPO
  - Surgical consult
  - Initiate empiric antibiotics (options):
    - Single agents: Ertapenem, meropenem, piperacillin/tazobactam
    - Combination: Cefepime, ceftazidime, ceftriaxone PLUS metronidazole, clindamycin, or gentamicin

## ACEP Clinical Policies

- Intrabdominal Infections -



## ACEP Clinical Policy Statements

- In ED patients with possible acute appendicitis, can a clinical prediction rule be used to identify patients for whom no advanced imaging is required?
  - Level A Recommendations: None
  - Level B Recommendations:
    - In pediatric patients, clinical prediction rules can be used to risk stratify for possible acute appendicitis. However, do not use clinical prediction rules alone to identify patients who do not warrant advanced imaging for the diagnosis of appendicitis.
  - Level C Recommendations
    - In adult patients, due to insufficient data, do not use clinical prediction rules to identify patients for whom no advanced imaging is required.



## ACEP Clinical Policy Statements

- In ED patients with suspected acute appendicitis, is the diagnostic accuracy of ultrasound comparable to CT or MRI for the diagnosis of acute appendicitis?
  - Level A Recommendations: None
  - Level B Recommendations:
    - In pediatric patients with suspected acute appendicitis, if readily available and reliable, use RLQ ultrasound to diagnose appendicitis.
    - An unequivocally\* positive RLQ US with complete visualization of a dilated appendix has comparable accuracy to a positive CT or MRI in pediatric patients.
  - Level C Recommendations
    - In adult patients with suspected acute appendicitis, an unequivocally\* positive RLQ US has comparable accuracy to a positive CT or MRI for ruling in appendicitis.
    - \*A non-visualized or partially-visualized appendix should be considered equivocal. Reasonable options for pediatric patients with an equivocal ultrasound and residual suspicion for acute appendicitis include MRI, CT, surgical consult, and/or observation, depending on local resources and patient preferences with shared decision making.



## ACEP Clinical Policy Statements

- In ED patients who are undergoing CT of the abdomen and pelvis for suspected acute appendicitis, does the addition of contrast improve diagnostic accuracy.?
  - Level A Recommendations: None
  - Level B Recommendations:
    - In adult and pediatric ED patients undergoing CT for suspected acute appendicitis, use IV contrast when feasible. The addition of oral or rectal contrast does not improve diagnostic accuracy.
  - Level C Recommendations
    - In adult ED patients undergoing CT for suspected acute appendicitis, non-contrast CT scans may be used for the evaluation of acute appendicitis with minimal reduction in sensitivity.



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