
WHAT'S PNEU
WITH
PNEUMONIA?
CHRIS EVANS, DO
4/5/2023

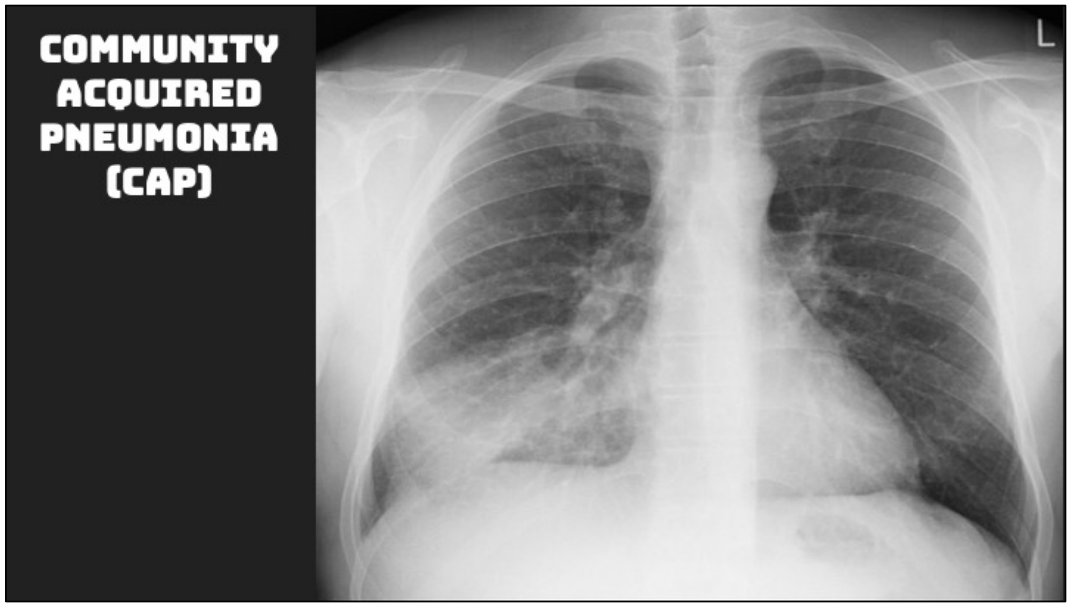
DISCLOSURES

NONE

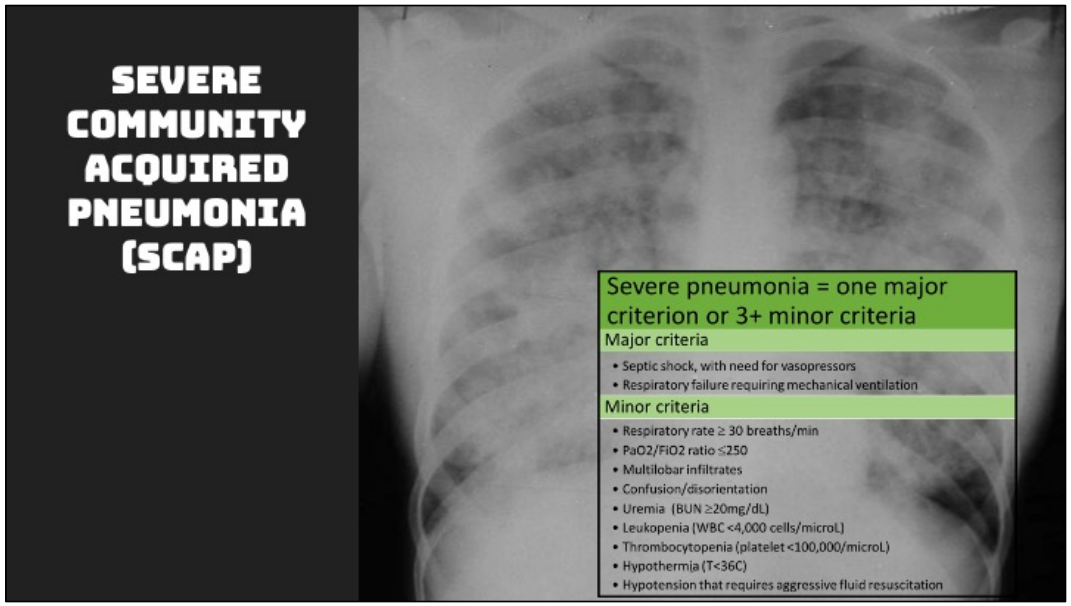
OBJECTIVES

- PER THE 2019 IDSA CAP GUIDELINES, REVIEW:
  - TYPES OF CAP
  - CAP TERMINOLOGY UPDATES
  - MICROBIOLOGY
  - IMAGING
  - LABS
  - SCORING TOOLS
  - OUTPATIENT CAP TREATMENT
  - INPATIENT CAP TREATMENT

IDSA/ATS vs UTD



CAP



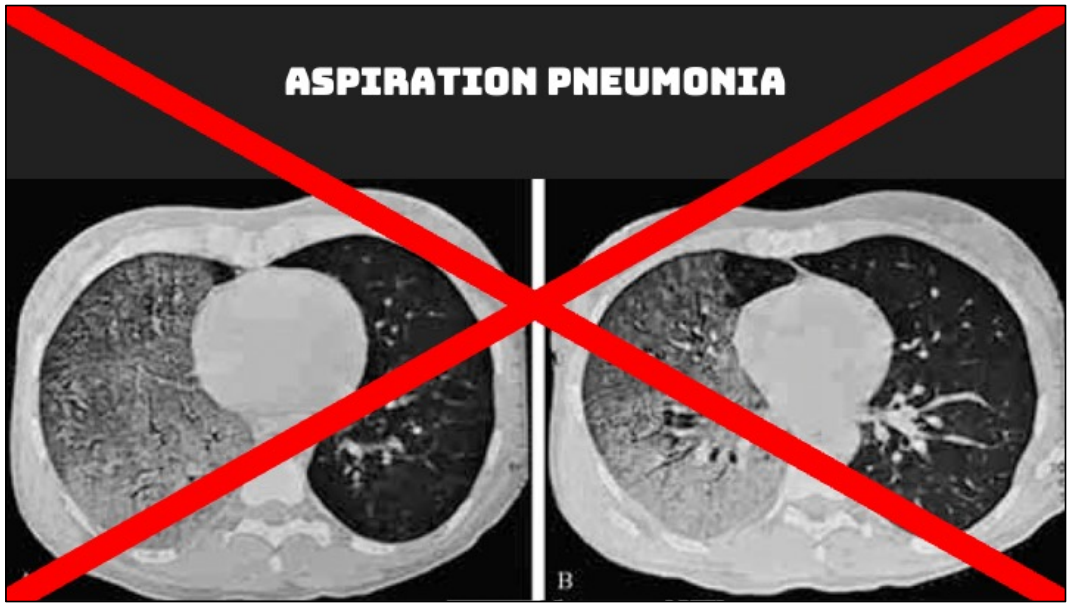
Severe CAP. 3(+) minor criteria or 1 major criterion

- Minor: RR >=30, ARDS by def, multilobar infiltrates, AMS, Uremia (BUN >=20), Leukopenia (WBC <4k), Thrombocytopenia (Plt <100k), Hypothermia (core T <36C), Hypotension requiring aggressive IVF
- Major: Pressors, Intubation

Hospital Acquired Pna

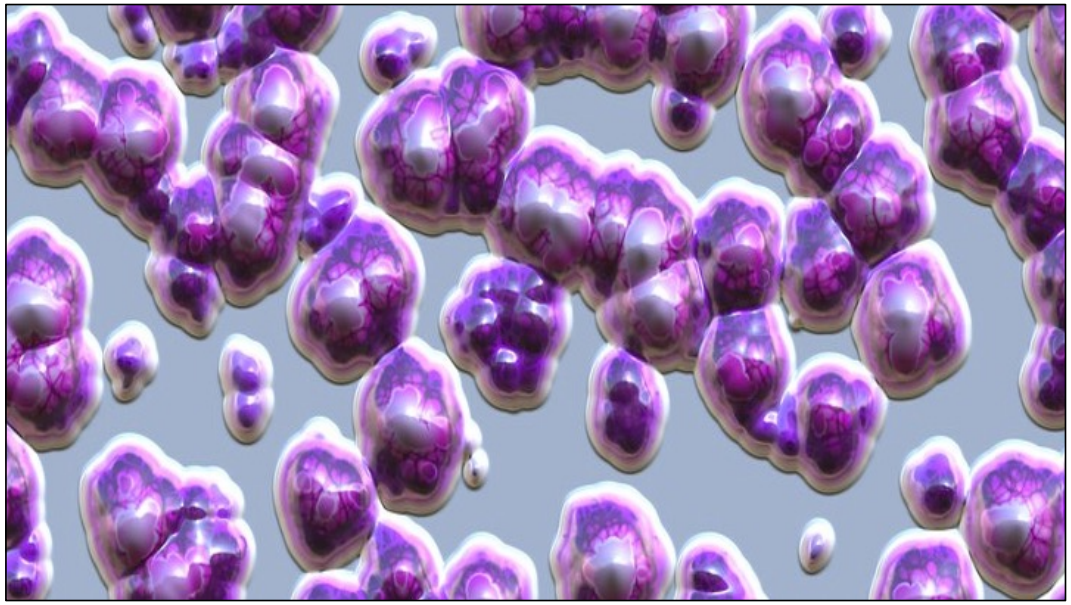
Viral Pna- Flu, covid, RSV


FUNGAL
PNEUMONIA



Aspiration pneumonia for all intents and purposes IS OUT

HCAP is out!



- Typical
  - *S. pna, H. flu, S. aureus,* GAS, *Moraxella catarrhalis,* anaerobes, aerobic G- bact
- Atypical
  - *Legionella, M. pna, Chlamydia psittaci*
  - *Mycoplasma pna* is the most common atypical
- *S. pna* accounts for majority of ALL pneumonia
- Most Common Pathogens
  - Outpatients, inpatients, ICU- *S. pna*
  - Anaerobes
    - *Bacteroides melaningenicus, Fusobacterium, Peptostreptococcus*
- Viruses
  - Flu, parainflu, RSV, rhinovirus, COVID
- Fungal
  - Cryptococcal, Histoplasma (<5% exposed develop sx dz)

Imaging

- IDSA/ATS require demonstration of infiltrate on chest imaging to make dx
- Cxr 93% specific, but 46-77% sensitive, meaning exclusive use of cxr would result in missing CAP dx in about 1/3 - ½ of patients with CAP.
- Consider CT if cxr is neg, but high pretest prob, esp in immunocompromised, elderly, undifferentiated sepsis/shock
- No need for repeat imaging to show resolution

Lab Testing

- Obtain pre-tx respiratory secretions GS + cx, MRSA swabs, and blood cx if:
    - Severe CAP
    - Being empirically treated for MRSA &/or P. aeru
    - Were previously infected with MRSA or P. aeru
    - Were hospitalized & received IV abx in past 90 days
        - MRSA nasal PCR swab
            - Hi negative predictive value w/r to future positive MRSA blood or sputum cx- negative means pt very likely does not have dz
            - Low positive predictive value- a positive MRSA nasal swab does not mean future blood cx or sputum cx will be positive for MRSA
            - If MRSA swab is negative, STOP MRSA coverage even if hx of MRSA cultures except pts with IVDA, cavitary lxs, septic shock, necrotizing pna
    - Blood cx
        - Obtaining blood cx have actually shown worse clinical outcomes d/t false positives and subsequent increased LOS
- Influenza

    - Test influenza if endemic in community
        - Positive flu→likely deescalate abx
- Strep & Legionella:
    - Do NOT obtain legionella or S. pna urine Ag unless significant exposure to Legionella
    - Do NOT blood cultures for non-severe CAP as it often lead to false positives
        - But performance measures limits utility of this rec
- Procalcitonin
    - Do NOT let procalcitonin guide initiation of abx.
    - Can be used by inpatient team to determine improvement, so if they want it, get it

Assessing Severity of CAP to help with disposition

- Pneumonia Severity Index vs CURB-65
- PSI preferred, but not necessarily practical for ER given 21 variables, but better than CURB-65 by evidence
- CURB-65 still conditionally recommended
- Who should go to ICU?
    - Shock on pressors
    - Intubation

Treatment

Outpatient CAP

- Amox 1g PO TID x5d **OR**
- Doxycycline 100 mg BID x5d **OR**
    - UTD quotes resistance ~10-20% in US
- Azithromycin pack
    - Only in areas where resistance <25%
    - UTD quotes resistance often >30% in US
- Fluoroquinolones are 2nd line therapy if no contraindications to PCNs or doxy


OUTPATIENT CAP W/ COMORBIDITIES
Amox/Clav 875mg BID or
Cefpodoxime 200mg BID
+
Macrolide
2 ABX
X5 DAYS
Monotherapy
Doxy 100mg BID
Levoflox 750mg daily
Moxiflox 400mg daily

CAP

- x5 days of-
- Beta-lactam
    - Ampicillin/sulbactam 1.5g q6h **OR**
    - Cefotaxime 1g q8h **OR**
    - Ceftriaxone 1g daily **OR**
    - Ceftaroline 600mg q12h

  PLUS
- Macrolide
    - Azithromycin 500mg daily **OR**
    - Clarithromycin 500mg BID

  OR monotherapy with
- Fluoroquinolone
    - Levofloxacin 750mg daily **OR**
    - Moxifloxacin 400mg BID

- Pts with contraindications to macrolides & Fluoroquinolones:
    - Beta-lactam **PLUS** Doxycycline 100mg BID

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Inpatient CAP MRSA & P. aeru Coverage

- 7 days of
  - Vancomycin 15mg/kg q12h **OR**
  - Linezolid 600mg q12h
- Patients should only be covered for MRSA and/or P. aeru if:
  - Patient has been dx with MRSA or P. aeru by culture within the past year
  - Patient has received IV abx during a hospitalization within the past 90 days
- If going to start empiric abx to cover MRSA and P. aeru, obtain cultures for rapid de-escalation if those cultures are negative
  - MRSA nasal PCR swab

Inpatient CAP P. aeru Coverage

- 7 days of Pseudomonal Coverage
  - Piperacillin-Tazobactam 4.5mg q6h **OR**
  - Cefepime 2g q8h **OR**
  - Ceftazidime 2g q8h **OR**
  - Aztreonam 2g q8h **OR**
  - Meropenem 1g q8h **OR**

    - Imipenem 500mg q6h

PLUS

- Atypical Coverage
    - Azithromycin 500mg daily **OR**
    - Clarithromycin 500mg BID

      OR monotherapy w/
    - Fluoroquinolone
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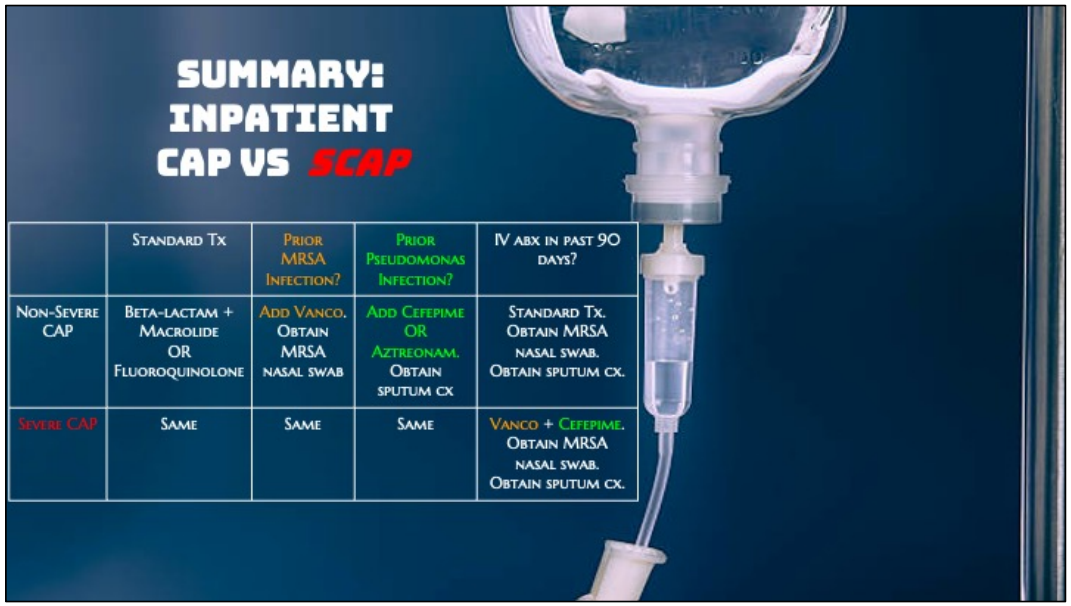
SUMMARY:
INPATIENT
CAP VS SCAP
Standard Tx
Prior MRSA Infection?
Prior Pseudomonas Infection?
IV abx in past 90 days?
Non-Severe CAP
Beta-lactam + Macrolide OR Fluoroquinolone
Add Vanco. Obtain MRSA nasal swab
Add Cefepime OR Aztreonam. Obtain sputum cx
Standard Tx. Obtain MRSA nasal swab. Obtain sputum cx.
Severe CAP
Same
Same
Same
Vanco + Cefepime. Obtain MRSA nasal swab. Obtain sputum cx.

Inpatient & Outpatient Viral Pneumonia

- Give oseltamivir in pts with CAP who test positive for influenza
- Give standard above recommended antibiotic regimen for patients who test positive for influenza as bacterial pna can occur concurrently with influenza virus
    - ~10% of hospitalized flu pts
    - In 2009, an autopsy series of H1N1 pts showed bacterial coinfection in 30% of pts with influenza


QUESTIONS?