UWTASP
tele-antimicrobial stewardship program

January 17, 2023

Agenda

- Title: *CAP Guidelines*

CAP Guidelines: a lung time coming

Guidelines last updated: 2007

<u>Will not cover:</u>

- Immunocompromised patients
  - Refer to 2019 Pneumonia in Solid Organ Transplantation: Guidelines from ATS Infectious Diseases
- Patients with history of foreign travel

<u>Refer to:</u>

- HAP/VAP guidelines 2016

CAP pathogens: do we really know?

Streptococcus pneumoniae
Haemophilus influenzae
Moraxella catarrhalis
Staphylococcus aureus

→

Streptococcus pneumoniae
Viruses

ORIGINAL ARTICLE

Community-Acquired Pneumonia Requiring Hospitalization among U.S. Adults

Seema Jain, M.D., Wesley H. Self, M.D., M.P.H., Richard G. Wunderink, M.D., Sherene Fakhran, M.D., M.P.H., Robert Balk, M.D., Anna M. Bramley, M.P.H., Carrie Reed, Ph.D., Carlos G. Grijalva, M.D., M.P.H., Evan J. Anderson, M.D., D. Mark Courtney, M.D., James D. Chappell, M.D., Ph.D., Chao Qi, Ph.D., et al., for the CDC EPIC Study Team*

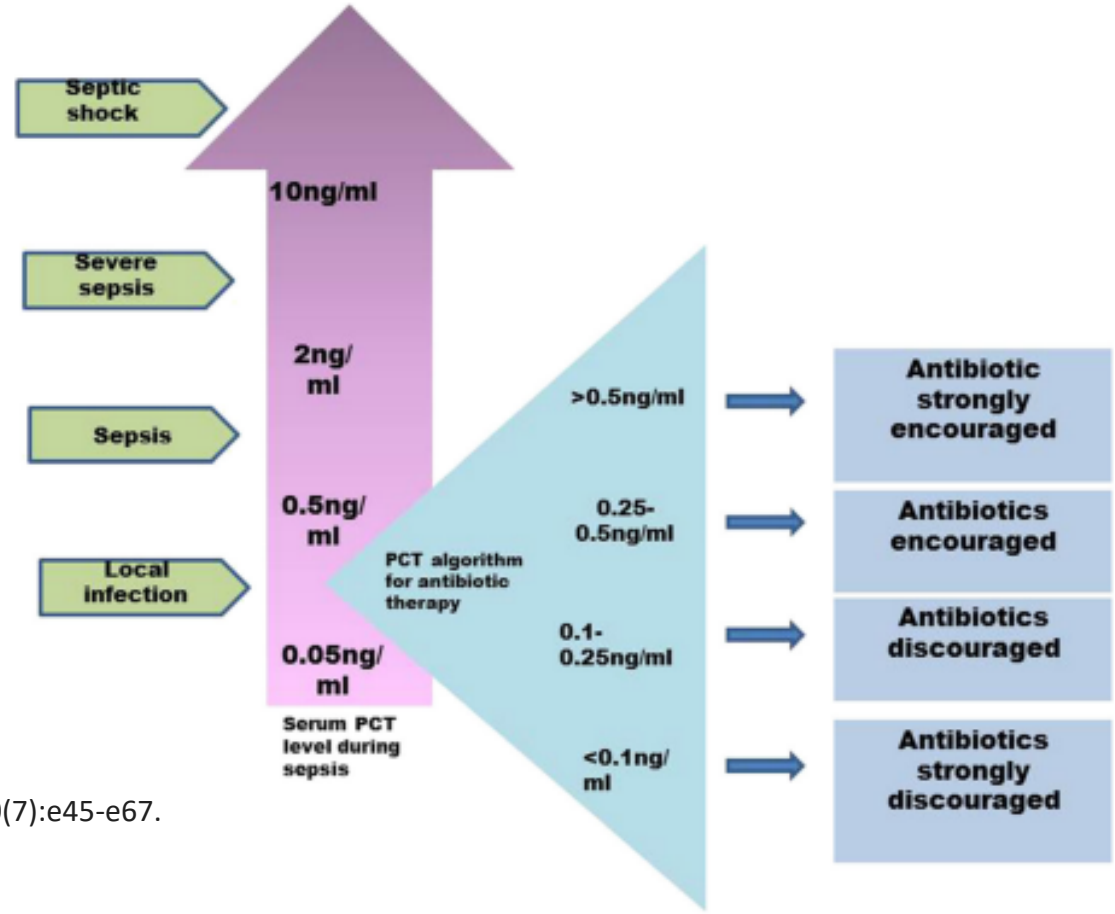
60% with no pathogen detected in sputum

Jain S, et al. N Engl J Med. 2015;373(5):415-427.

Use PCT to stop, not start antibiotics

"We recommend that empiric antibiotic therapy should be initiated in adults with clinically suspected and radiographically confirmed CAP regardless of initial serum procalcitonin level"

Increased PCT = increased probability of a bacterial infection

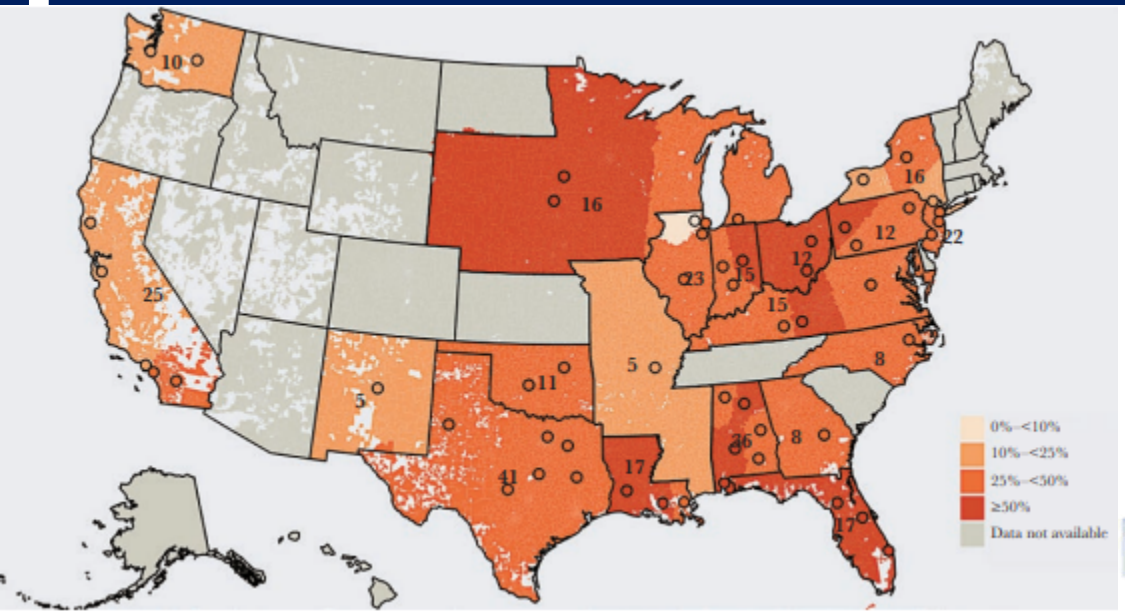


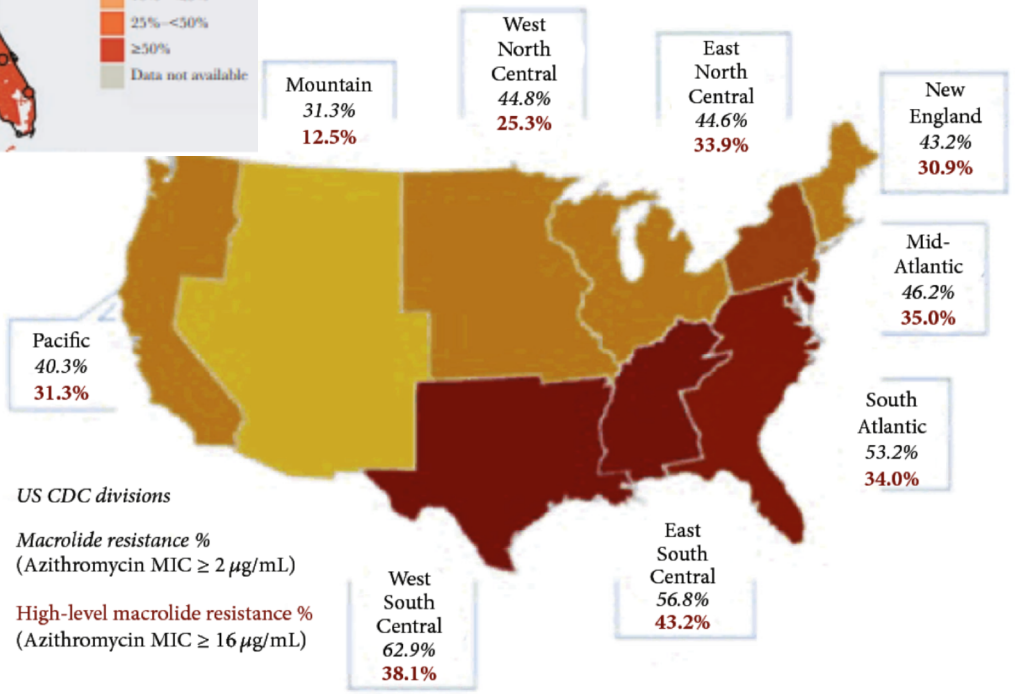
Metlay JP et al. Am J Respir Crit Care Med. 2019 Oct 1;200(7):e45-e67.
Vijayan A, et al. Journal of Intensive Care. 2017;5:51.
Covington E, et al. Pharmacotherapy. 2018;38(5):569-581.

CAP treatments – outpatient

- No comorbidities:
  - High dose amoxicillin or doxycycline
- Comorbidities:
  - amoxicillin/clavulanate or cephalosporin + macrolide or doxycycline
  - Fluoroquinolone monotherapy

Macrolide resistant S. pneumo

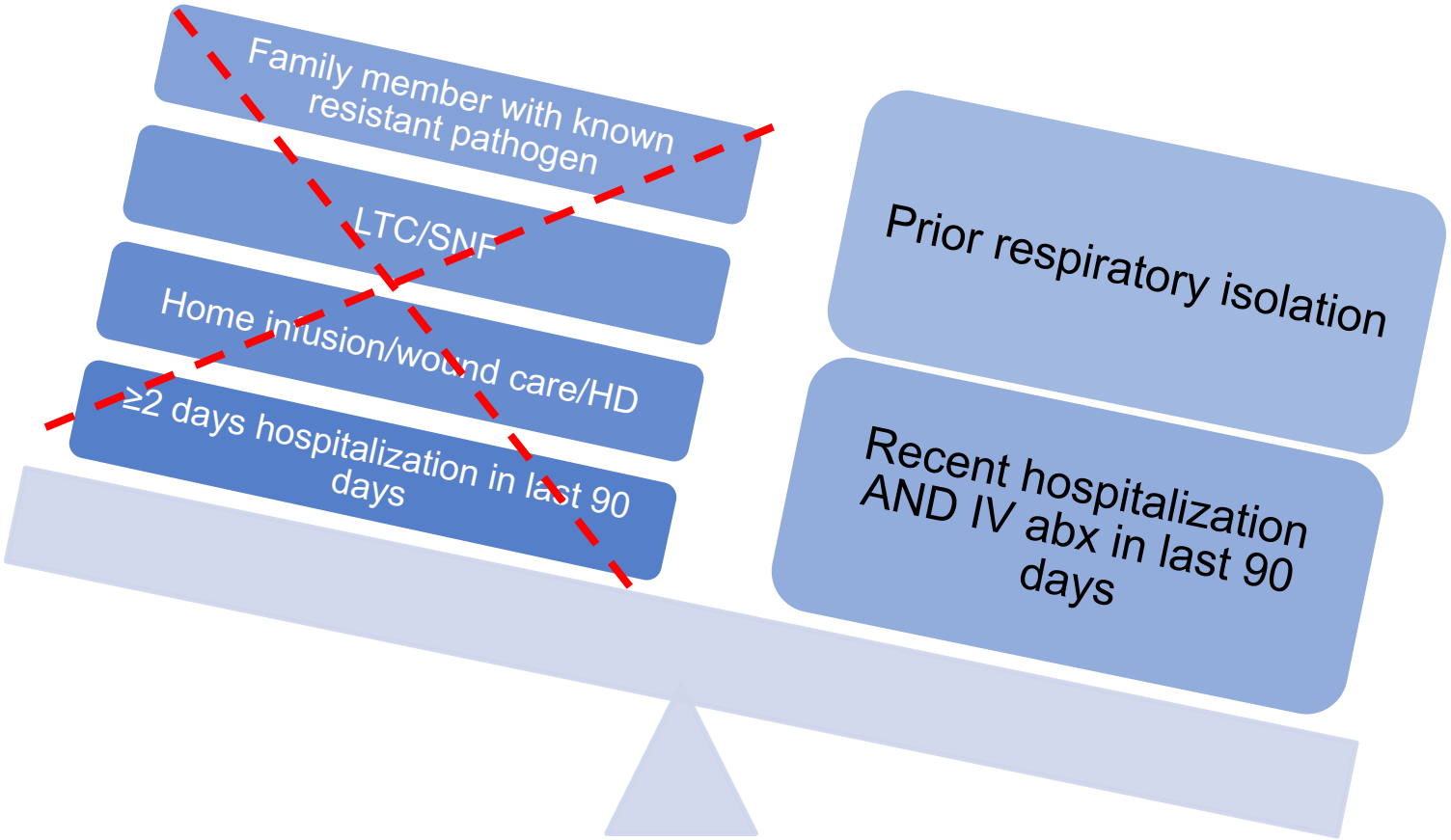




Blondeau JM, et al. J Infect Dis Ther. 2017;5:313.
Gupta V, et al. OFID. 2021.

No more HCAP

"We recommend abandoning use of the prior categorization of healthcare-associated pneumonia (HCAP) to guide selection of extended antibiotic coverage in adults with CAP"



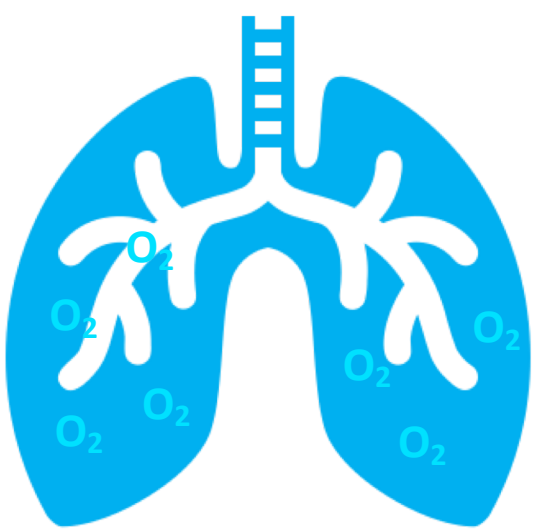
CAP treatments – inpatients

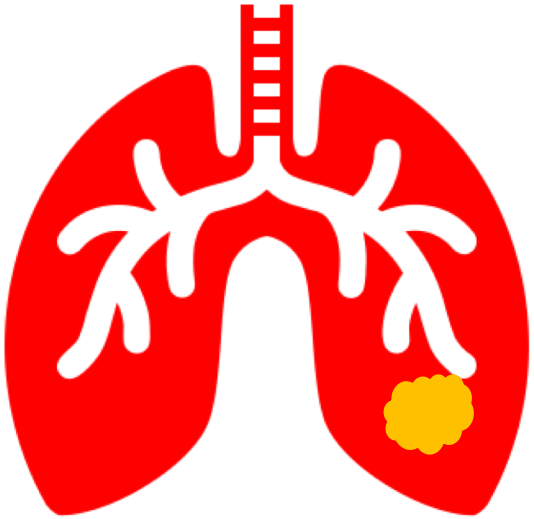
- Non-severe or severe:
  - Ceftriaxone + azithromycin
- History of prior cultures for MRSA or Pseudomonas:
  - Add appropriate coverage
- Severe pneumonia with recent hospitalization + exposure to IV antibiotics in the last 90 days:
  - Add appropriate coverage

→ Focus on de-escalation/duration at 48h

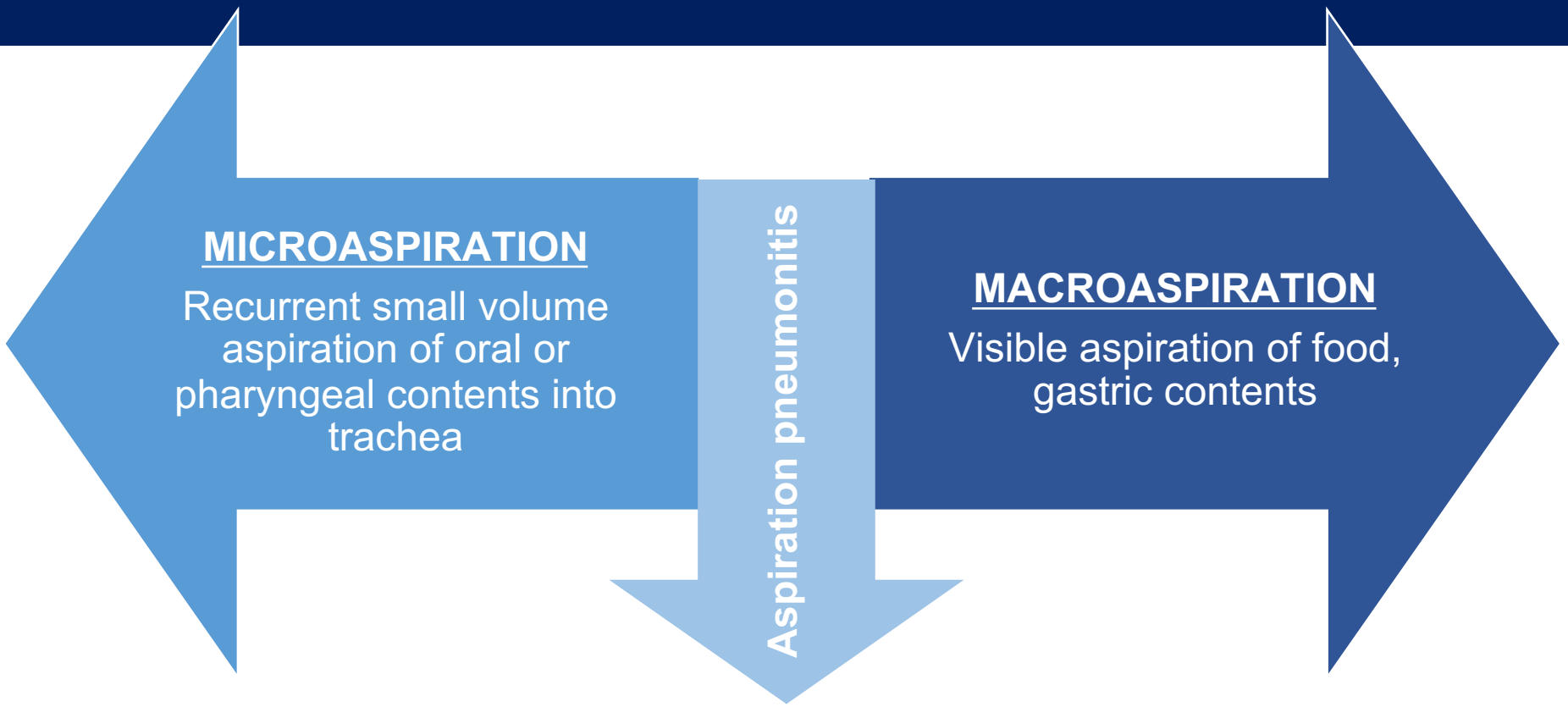
Aspiration pneumonia

"We suggest not routinely adding anaerobic coverage for suspected aspiration pneumonia unless lung abscess or empyema is suspected"





Micro vs Macroaspiration



Contributors to pathophysiology of aspiration pneumonia: volume of inoculum, pH, and chronicity/frequency of event

Mandell L, et al. N Engl J Med. 2019;380:651-63.
Neill S, et al. Current Opinion. 2019;32(2):152-157.

Pneumonitis does not improve with antibiotics

Clinical Infectious Diseases

MAJOR ARTICLE

IDSA Infectious Diseases Society of America

hivma hiv medicine association

OXFORD

Prophylactic Antimicrobial Therapy for Acute Aspiration Pneumonitis

Vlad Dragan,[1] Yanliang Wei,[1] Marion Elligsen,[2] Alex Kiss,[3] Sandra A. N. Walker,[2,4] and Jerome A. Leis[1,3,5,6]

[1]Department of Medicine, University of Toronto, [2]Department of Pharmacy, Sunnybrook Health Sciences Centre, [3]Sunnybrook Research Institute and Institute of Health Policy, Management and Evaluation, [4]Leslie Dan Faculty of Pharmacy, University of Toronto, [5]Division of Infectious Diseases and General Internal Medicine, Sunnybrook Health Sciences Centre, and [6]Centre for Quality Improvement and Patient Safety, University of Toronto, Ontario, Canada

Prophylactic antibiotics DO NOT:

- Decrease 30-day mortality
- Decrease ICU transfers

Prophylactic antibiotics MAY:

- Generate selective antibiotic pressure
- Lead to abx escalation

Dragan V, et al. CID. 2018;67(4):513-8.

Pneumonitis ≠ Pneumonia

- Aspiration of gastric contents – aspiration pneumonitis
  - Supportive care only
  - Symptom resolution 24-48h
- Can suspect secondary pneumonia if symptoms persist >48h after macro-aspiration
- Do not need additional anaerobic coverage – most pulmonary infections do not involve anaerobes
- (Most CAP antibiotics cover PO anaerobes already)

De-escalation

De-escalation of antibiotic therapy at 48 hours is appropriate if microbiological results do not yield drug-resistant pathogens or are negative and patient is improving

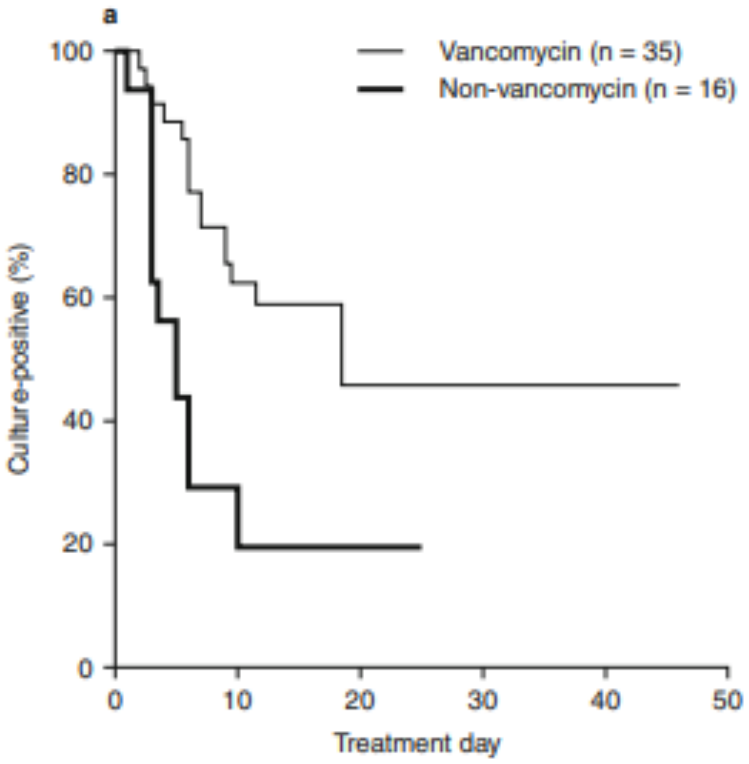
- MRSA nasal swabs
  - High specificity and sensitivity
  - High negative predictive value
  - Lower sensitivity and positive predictive value, especially for more severe pneumonia

PNA	Sensitivity	Specificity	PPV	NPV
CAP	85%	92%	57%	98%
VAP	40%	94%	36%	95%

Parente D, et al. CID. 2018;67(1):1-7.

Timing of MRSA swab

- Antibiotics are ineffective at clearing nasal colonization
- Culture or PCR MRSA swab should remain reliable if obtained after antibiotics
- If using reference lab, getting it earlier is key!



Keene A, et al. ICHE. 2016; 2005 Jul;26(7):622-8.
Moise-Broder P, et al. Clin Pharmacokinet. 2004;43(13):925-42.

Discontinuing β-lactam treatment after 3 days for patients with community-acquired pneumonia in non-critical care wards (PTC): a double-blind, randomised, placebo-controlled, non-inferiority trial

Articles
THE LANCET

RCT:
adults with moderate CAP(N~300)

Excluded:
immunocompromised, severe or complicated CAP, suspected aspiration PNA, HAP

3 days
(N=157)

8 days
(N=153)

Primary outcome:
Cure at 15d after starting therapy (70-78%)

Secondary outcomes:
1. Cure at 30d (70-75%)
2. LOS difference: 1 day
3. No differences in all cause mortality, ADEs, or CAP symptom scores

Considerations:

- Minimal cultures
- No PCTs, inclusion of older patients with comorbidities
- De-escalation at 72h is encouraged

Dinh A, et al. The Lancet. 2021; ;397(10280):1195-1203.

What's the harm in an extra day?

- Overall: 3-5 days adequate
- MRSA, *P. aeruginosa* - 7 days (consistent with HAP/VAP)
- Longer courses recommended for: pneumonia complicated by secondary disease, less common pathogens

4% increased risk for new resistance within 60 days with each additional day of an antipseudomonal β-lactam

Teshome B, et al. Pharmacotherapy. 2019;39(3):261-268.

Setting expectations

- 1 week: resolution of fever
- 4 weeks: reduced chest pain and sputum production
- 8 weeks: reduced cough and breathlessness
- 3 months: fatigue may still be present, however most other symptoms should be resolved
- 6 months: should feel back to normal

CAP Takeaways

- Treatment
  - High dose amoxicillin
  - Fluoroquinolones remain first line per guidelines; however, should consider using sparingly
  - Consider deescalating at 48 hours
- May use PCTs to de-escalate therapy, not for initiation
- No more HCAP
- No more anaerobic coverage
- 5 days is adequate (7 days for MRSA/*P. aeruginosa*)
  - Clearance of infection may precede improvement in symptoms