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tele-antimicrobial stewardship program

4 Moments of Antimicrobial Stewardship

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UW-TASP

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tele-antimicrobial stewardship program

- No financial conflicts of interest.
- Everything we discuss is QI, thus protected from legal discovery under WA State Code.

Paul Pottinger MD

4 Moments: *Objectives*

- Name the 4 Moments…
- Examples for Each Moment…
- Share your successes and challenges

4 Moments: *Overview*

- Steward's Perspective
  - ✓ We think about bugs & drugs for a living...
  - ✓ Macro-data perspective...
  - ✓ AS is clearly the right thing to do...

- Prescriber's Perspective
  - ✓ ID one of many tasks in a busy day...
  - ✓ Individual patient-focus...
  - ✓ AS sounds cool... I want to help...
    I'm busy... HOW can I make a difference?

4 Moments: *Overview*

- Make It Easy
- Boil our approach into 4 moments...

1. Does my pt have an infection that needs abx?
2. If so... have I ordered cultures before abx? And what empiric abx should I choose?
3. It's a new day... Can I stop abx, or deescalate spectrum, or convert IV to PO?
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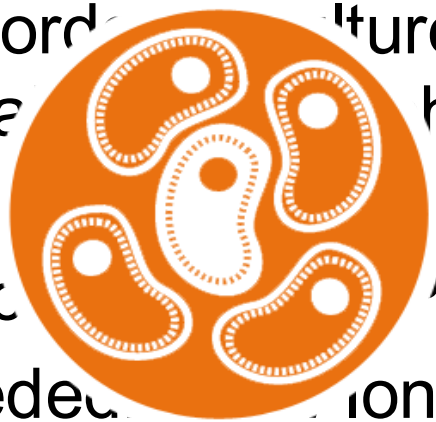

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Moment #1: *Does my pt need abx?*

Common Pitfalls

- UTI... or ASB?
- CAP... or bronchitis?
- Sinusitis... or viral URI?
- Cellulitis... or uncomplicated abscess?

Moment #1: *Does my pt need abx?*

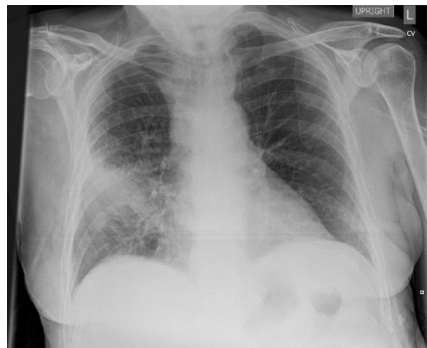
UTI... or ASB?

- Colonization (asymptomatic bacteriuria): Endogenous flora ascends urethra (common in elderly). Abx NOT indicated.
- Infection (UTI): Inflammatory response to invasive bugs (rare). Abx for this subset only.

Moment #1: *Does my pt need abx?*

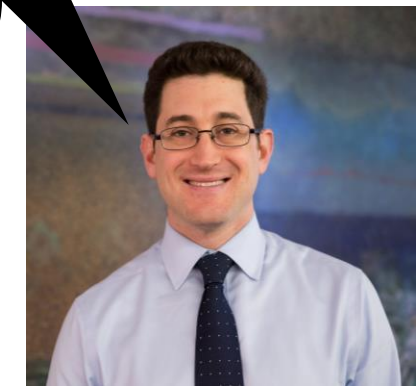
CAP... or Bronchitis?

- Bronchitis (Common... rarely harmful): Cough but **no infiltrates** or sepsis. Abx NOT indicated.
- CAP (potentially deadly): Cough... purulent sputum... fever... WBC elevation... **infiltrate on CXR**. Abx for this group.



Moment #1: *Does my pt need abx?*

"Despite clear evidence, guidelines, quality measures and more than 15 years of educational efforts stating the antibiotic prescribing rate should be zero, the antibiotic prescribing rate for acute bronchitis is around 70%"



Michael Barnett, MD
JAMA 2014

Moment #1: *Does my pt need abx?*

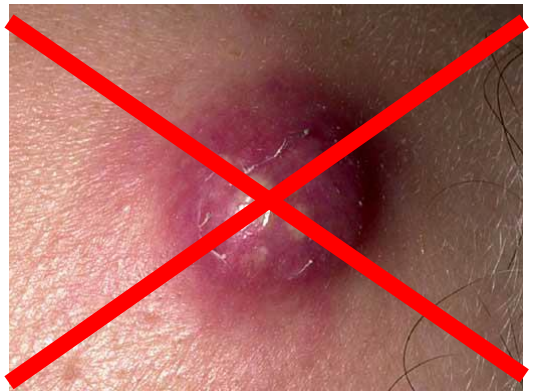
Bacterial Sinusitis... or Viral URI?

- <u>Viral URI (Common... rarely harmful)</u>: Sinus pain but **non-toxic,** < 3 weeks, no warning signs. Abx NOT indicated.
- <u>Bacterial Sinusitis (potentially harmful)</u>: Severe, **worsening** with symptomatic therapy. Abx may cut severity & duration.

Moment #1: *Does my pt need abx?*

Cellulitis... or Simple Abscess?

- Uncomplicated Abscess (usually *S.aureus*): Pus but **non-toxic**. I&D usually curative... Abx NOT mandatory.
- Cellulitis (usually β-strep): Red leg, but no pus. Nothing to drain... Abx indicated.



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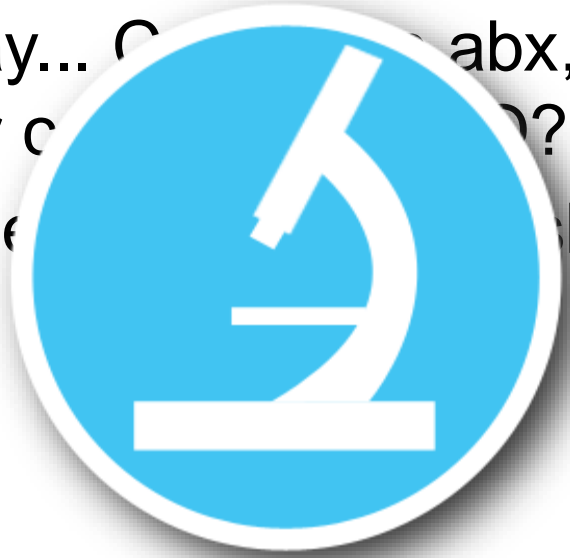

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Moment #2: *UTI Testing....*

Microscopic analysis

Pyuria: majority of symptomatic UTIs have pyuria…
but *lower PPV among catheterized pts*

Gram stain for bacteria: >1 organism per hpf on uncentrifuged urine is >10^5 on culture

Culture

Method: collect from mid-stream or sterilized tube port, not bag
Inoculate 1 to 10 μl onto agar plate

Criteria for *Enterobacteriaceae* UTI

- Symptomatic women
  10^2: sensitivity 95%, specificity 85% for cystitis
- Asymptomatic women
  10^5: used in high risk clinical settings & research

Moment #2: *Cystitis Empiric Rx....*

- Nitrofurantoin (*Ma*
  5 d (caution in

Puget Sound: ~20% Resistance

- TMP/SMX (*Bactrim*) resistance <20%:
  1 DS PO BID x 3 days

OR

- Fosfomycin (*Monurol*) 3gm PO x 1 dose (not for pyelo!)
- TMP/SMX resistance >20%:
  - ✓ Cipro 500mg PO QD x 3 days *OR*
  - ✓ Cefpodoxime 100mg PO BID x 5 days

Moment #2: *CAP Testing....*

Microscopic Sputum Analysis

- Sheets of gram-positive diplococci? It's *S.pneumoniae*!

Cultures

- Blood Cultures: Up to 20% positivity.
- Sputum Cultures: Often overgrown with oral flora

Other Testing

- CXR
- CBC with Diff, CMP
- Urinary pneumococcal antigen
- Consider influenza testing... legionella testing

Moment #2: *CAP Empiric Rx....*

FIRST LINE:

- Ceftriaxone 2 g IV q24 hours PLUS
- Azithromycin 500 mg PO/IV q24 hours x 3 days unless confirmed Legionella pneumonia
- Alternative to azithromycin if history of long QTc: Doxycycline 100mg po BID
- Consider adding vancomycin if post-influenza pneumonia or necrotizing pneumonia.

SECOND LINE for Severe beta-lactam allergy:

- Levofloxacin 750mg PO/IV q24 hours

Moment #2: *Sinusitis Testing....*

- H & P most important
- Sinus CT very sensitive... poorly specific
- Culture sinus contents only via ENT specialist
- Usually entire course will be empiric... so please be thoughtful!

Moment #2: *Sinusitis Empiric Rx....*

1st Line Empiric Abx

- Amox-Clav 875-2000 mg PO BID x 5-7 Days

2nd Line Empiric Abx

- Doxycycline 100 BID or
- Levofloxacin 500 QD or
- Moxifloxacin 400 QD

} 5-7 Days

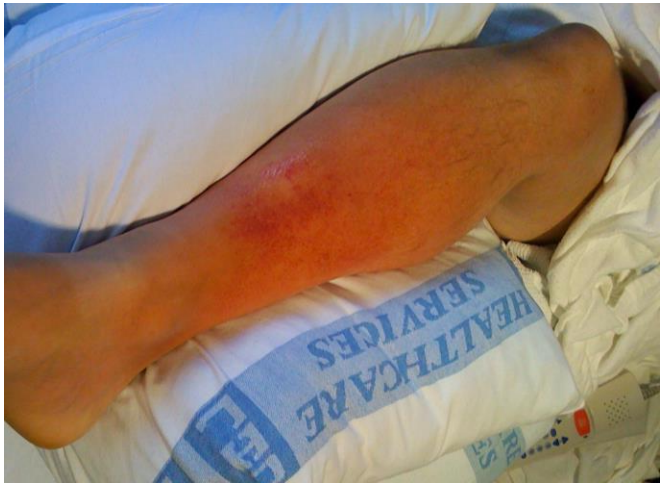
FQ Only if NO OTHER OPTIONS

No Longer Recommended

- Azithromycin, TMP/SMX

Moment #2: *Cellulitis Testing....*

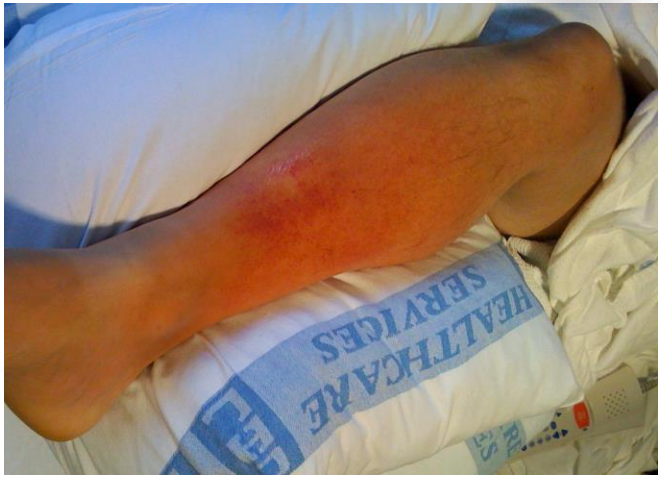
- H & P most important
- Blood Cultures suuuuuper helpful when positive... but this is exceptional
- Usually entire course will be empiric... so please be thoughtful!



MANAGEMENT OF SSTIs

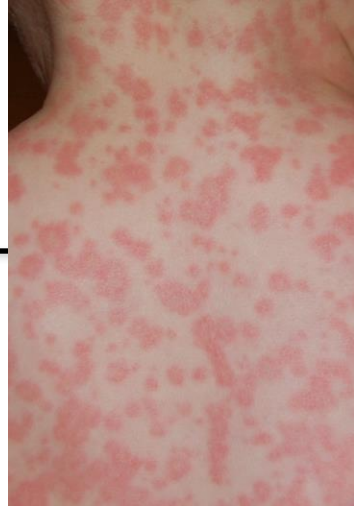
NONPURULENT
Necrotizing Infection /Cellulitis /Erysipelas

- **Severe**
- **Moderate**
  - **INTRAVENOUS Rx**
    - Penicillin *or*
    - Ceftriaxone *or*
    - Cefazolin *or*
    - Clindamycin
- **Mild**
  - **ORAL Rx**
    - Penicillin VK *or*
    - Cephalosporin *or*
    - Dicloxacillin *or*
    - Clindamycin



IDSociety.org (2014)

Penicillin Allergies



"A Hot Mess"

"I'm Allergic:" **Please figure this out!**

- 10% of Americans report a "PCN allergy"
- **> 90% of these are bogus! (nausea, yeast infxn....)**
- **50% increase in surgical site infections and adverse reactions** with second-line abx (vanco alone, clinda, FQ)
- **Inferiority** of clinda vs PCN or amox for most dental infections and surgical prophylaxis
- If reaction was <u>not life-threatening</u>, oral amox challenge always safe, and **> 95% have no reaction!**

Blumenthal 2018 / Iammatteo 2019

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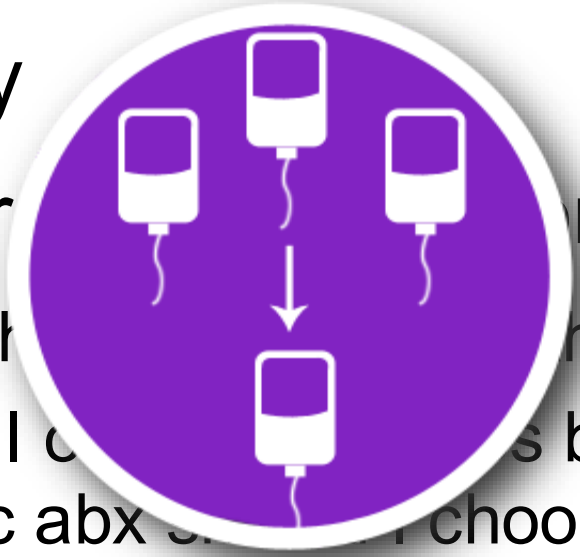

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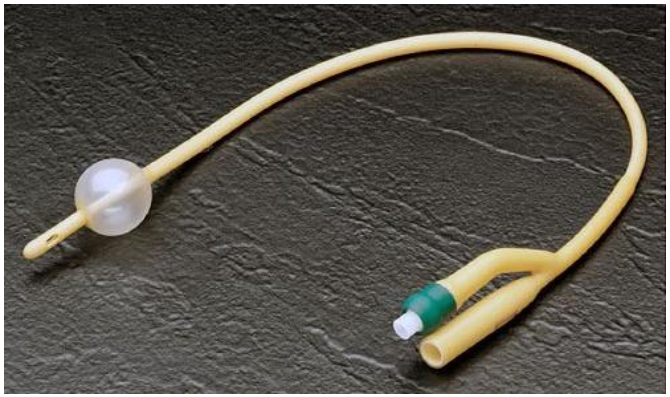
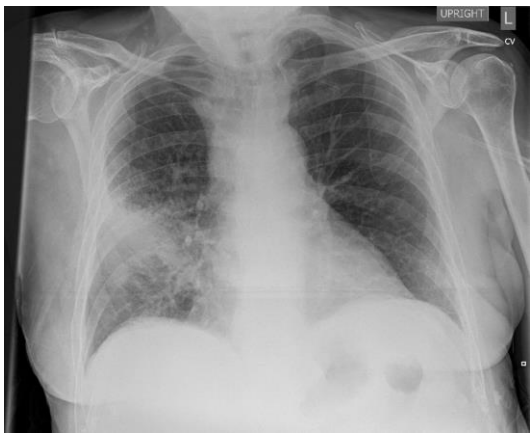
Moment #3: *Cystitis De-Escalation...*

- It's *E.coli*... right?
- Most will be sensitive to nitro or TMP/SMX or fosfomycin... all great options in cystitis.
- For pyelonephritis, best likely options are FQ or TMP/SMX or beta-lactam... and all can be given PO.

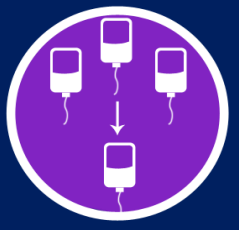


Moment #3: *CAP De-Escalation...*

- Patient is improving... right?
- It's *S.pneumo*... right?
- If so, follow the sensi panel... probably amoxicillin alone is fine.
- If cultures negative:
  - ✓ Amoxicillin 1000 mg PO TID
  - ✓ 2nd/3rd Generation Ceph
  - ✓ Levo or Moxi (if you must…)



Moment #2: *CAP Empiric Rx....*



On Day 2/3: De-escalate therapy

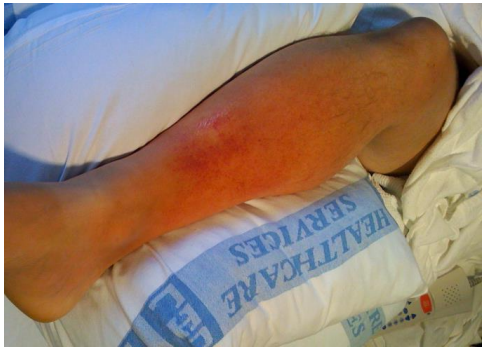
- If showing improvement, it is appropriate to de-escalate to oral antibiotics on day 2
- If started on broad-spectrum empiric therapy, de-escalate to first-line therapy based on patient's condition and laboratory data.
- Discontinue vancomycin if MRSA nares swab is negative or sputum without growth of MRSA.

Moment #3: *Sinusitis De-Escalation...*

- <u>Rarely possible to de-escalate</u>
- If pt returns: Did empiric abx help?
  - ✓ If so: Repeat course
  - ✓ If not: Consider alternative +/- ENT referral
- Regardless... sinus lavage, smoking cessation, analgesics, anti-inflammatories

Moment #3: *Cellulitis De-Escalation...*

- <u>Follow those blood cultures!</u>
- Did you start vancomycin?
  - ✓ If so... please stop it unless nares MRSA +
- Did IV cephalosporin help?
  - ✓ If so... convert to PO cephalexin or amoxicillin
- Regardless of dug chosen: Keep that leg elevated! Lymphedema care, etc.



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Moment #4: *Duration....*

Infections for Which Short-Course Therapy Has Been Shown to be Equivalent to Longer Therapy

	Treatment, Days	
Disease	**Short**	**Long**
Community-acquired pneumonia[1-3]	3-5	7-10
Nosocomial pneumonia[6,7]	≤8	10-15
Pyelonephritis[10]	5-7	10-14
Intraabdominal infection[11]	4	10
Acute exacerbation of chronic bronchitis and COPD[12]	≤5	≥7
Acute bacterial sinusitis[13]	5	10
Cellulitis[14]	5-6	10
Chronic osteomyelitis[15]	42	84

Abbreviation: COPD, chronic obstructive pulmonary disease.

JAMA Intern Med. 2016 Sep 1; 176(9): 1254–1255.

Zahra Kassamali Escobar, PharmD

Moment #4: *Cystitis Duration....*

- Nitrofurantoin *(Macrobid*) 100mg PO BID x 5 days (avoid in pyelo!) *OR*
- TMP/SMX (*Bactrim*) resistance <20%: 1 DS PO BID x 3 days *OR*
- Fosfomycin (*Monurol*) 3gm PO x 1 dose (avoid in pyelo!)

- TMP/SMX resistance >20%:
  - ✓ Cipro 500mg PO QD x 3 days *OR*
  - ✓ Cefpodoxime 100mg PO BID x 5 days

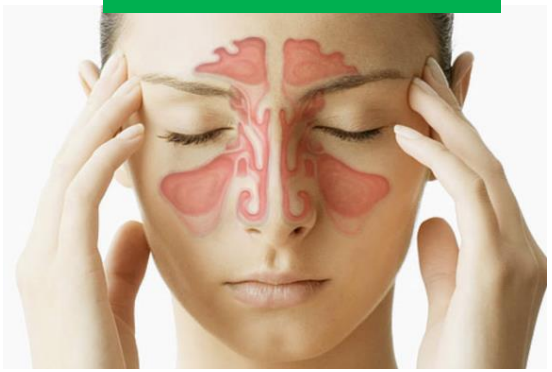
Moment #2: *CAP Empiric Rx....*

Day 1-2	Empiric Therapy	Ceftriaxone 2g IV q24h **PLUS** Azithromycin 500mg PO q24h **OR** Doxycycline 100mg PO BID	Total Duration
Day 2/3	Evidence of pneumococcal infection	Amoxicillin 1g PO TID Discontinue Azithromycin	5 days
	Pneumococcal bacteremia	Amoxicillin 1g PO TID Discontinue Azithromycin	7 days
	No organism identified	Amoxicillin 1g PO TID Azithromycin 500mg PO q24h	5 days 3 days

Moment #4: *Sinusitis Duration....*

1st Line Empiric Abx

- Amox-Clav 875-2000 mg PO BID x 5-7 Days



2nd Line Empiric Abx

- Doxycycline 100 BID or
- Levofloxacin 500 QD or
- Moxifloxacin 400 QD

} 5-7 Days

No Longer Recommended

- Azithromycin, TMP/SMX

Moment #4: *Cellulitis Duration....*

Non-purulent skin/soft tissue infection

Common organism: (Streptococcus species)

- Cefazolin 2g IV q8h
- PO option for Strep/MSSA: Cephalexin 500mg QID or 1000mg BID
- MRSA coverage is not necessary for non-purulent SSTI

Typical Duration: 5 Days

Purulent/abscess forming skin/soft tissue infection

Common organisms: (*S.aureus*: MSSA or MRSA) and less often Streptococcus species

- A negative MRSA nares does not rule out MRSA infections in a purulent cellulitis.
- Consider stopping MRSA coverage if no cultures are growing MRSA.
- Usually abx are unnecessary unless significant surrounding cellulitis or pt clinically unstable

Diagnosis: I&D abscess; send pus (not wound swab) for gram stain and culture.

- Vancomycin, dosed per pharmacy
- De-escalate when culture data available
- PO options for MRSA: Bactrim DS 1 tab BID or doxycycline 100mg BID
- PO options for MSSA or Strep: cephalexin 500mg QID or 1000mg BID

Typical Duration: 5 days

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4. If abx still needed... how long should I treat?

5. Prevent spread of bad bugs!

Tamma *JAMA* 2019


refreshingly
good
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MOBILE
MONEY
T 748 BLC
Not It's Easy

4 Moments: *Conclusions*

- The 4 Moments:
  - ✓ Need Abx?
  - ✓ Proper testing & empiric Rx?
  - ✓ De-Escalation at 24-48 hrs?
  - ✓ How long until done?
- Rational...
- Evidence-based...
- Easy-to-use!

Paul Pottinger MD

4 Moments: *Question*

Will you consider incorporating these “moments” into your AS activities?

A. Yep
B. Nope
C. Maybe