



12:45 – 1:30 pm

Antibiotic Use in the Outpatient Setting

SPEAKER
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Presenter Disclosure Information

The following relationships exist related to this presentation:

- Richard H. Glew, MD: No financial relationships to disclose.

Off-Label/Investigational Discussion

- In accordance with pmiCME policy, faculty have been asked to disclose discussion of unlabeled or unapproved use(s) of drugs or devices during the course of their presentations.

ANTIBIOTIC USE IN THE OUTPATIENT SETTING

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A 42yo homemaker with obesity and chronic lower extremity edema presents with sudden onset of chills, fever, & warm red distal right leg.

Scenario 1: the process occurred spontaneously, absent recent trauma; there are no wounds and no purulent discharge

Scenario 2: the process began after a splinter (retained) injury to the area; pus is draining from the wound

Scenario 3: the process began less than 1 day after a cat bite to the leg

ANTIBIOTIC THERAPY PRINCIPLES

1. Determine that an infectious etiology is likely
2. Identify likely site(s)
3. Consider likely organisms & susceptibilities:
 - If wound infection/pus, presume *S. aureus*/MRSA
 - If recent ABx, presume organism is resistant to that class of drug
 - If NH resident or recent hospitalization, presume possible MDRO (GNBs/MRSA/VRE)

ORAL ANTIBIOTIC ARMAMENTARIUM

AMOXICILLIN

DICLOXACILLIN or CEPHALEXIN
CEFUROXIME
CEFPODOXIME

LEVOFLOXACIN or MOXIFLOXACIN

METRONIDAZOLE

AZITHROMYCIN
DOXYCYCLINE

ORAL ANTIBIOTICS IN RENAL INSUFFICIENCY

ADJUST DOSING

In **≥moderate** renal insufficiency
Fluoroquinolones

In **severe** renal insufficiency
Amoxicillin
Cephalosporins
Sulfa/Trimethoprim

ORAL ANTIBIOTIC RX CONSIDERATIONS

ALLERGIES & INTOLERANCES

ANTICIPATE RESISTANCE (MRSA/MDRO-GNBS/VRE)

Nursing home resident
Recent ABx
Recent hospitalization

DRUG PENETRATION - prostate

CONVENIENCE - dosing frequency

COST

ORAL ANTIBIOTICS VS. *STREPTOCOCCUS* SPECIES

Amoxicillin/Ampicillin
Phenoxymethyl Penicillin (Pen VK)
Cephalosporins

Clindamycin

Fluoroquinolones - Levofloxacin Gatifloxacin Moxifloxacin

ORAL ANTIBIOTICS VS. *STAPH. AUREUS*

Dicloxacillin & Cephalosporins

25-50% of *S. aureus* in community are MRSA
Use only if culture confirms **MSSA**

Doxycycline - MSSA & MRSA
Clindamycin - MSSA

Linezolid (\$\$\$\$) - MSSA & MRSA

NOT RECOMMENDED

Erythromycin - most MRSA are resistant

ORAL ANTIBIOTICS VS. MRSA

Doxycycline

Sulfa/Trimethoprim

Linezolid \$\$\$

NOT RECOMMENDED

Clindamycin - 40% of MRSA resistant

ORAL ANTIBIOTICS vs. GPCs: LINEZOLID

Staph. aureus - MSSA & MRSA
Streptococcus species
Enterococcus species

Adverse effects

Cytopenias (esp. ↓platelets) with >10-14 days Rx
Contraindicated with MAO-I or SSRI → ↑Serotonin
\$\$\$

ORAL ABX VS. ENTEROCOCCI

Ampicillin (Amoxicillin)

Linezolid

ORAL ANTIBIOTICS VS. ANAEROBES

METRONIDAZOLE

Effective above & below diaphragm

Also protozoa - Giardiasis, Amebiasis, Trichomoniasis

β L/ β L-ase inhibitor combination - Amox/Clavulanate

Clindamycin

Doxycycline

ORAL ANTIBIOTICS: MACROLIDES

AZITHROMYCIN

Good GI tolerance

Convenience - once daily X5 days

Indicated vs.

Mycoplasma species

Legionella species

Resistance increasing

+/- vs. *Streptococcus* species - 10% resistant

NOT vs. *Staph. aureus*

20% of MSSA & nearly all MRSA are EM-resistant

ORAL ANTIBIOTICS: TETRACYCLINES

DOXYCYCLINE (MINOCYCLINE)

INDICATIONS

Staph. aureus (including MRSA)

Mycoplasma pneumoniae

Legionellosis

Spirochetes - Lyme Borreliosis & Syphilis

Anaplasma species & *Ehrlichia* species

Rickettsia species

Chlamydia species

CAVEAT

NO Δ in dosing for renal dysfunction)

NOT in pregnancy or growing children

ORAL ANTIBIOTICS VS. GNBs: CEPHALOSPORINS

2nd GENERATION

Moderate spectrum & potency vs. GNBs

Cefuroxime (Ceftin®)

Cefprozil (Cefzil®)

Cefdinir (Omnicef®)

~3rd GENERATION

Broad spectrum, good potency, but <Fluoroquinolones

Cefpodoxime (Vantin®)

Cefixime (Suprax®)

ORAL ANTIBIOTICS VS. GNBs: FLUOROQUINOLONES

Most broad, potent oral agent vs. GNBs

PO = IV

Prostate penetration uniquely excellent

OK vs. *Streptococcus* species

Adjust dosing in renal insufficiency

FLUOROQUINOLONES ADVERSE REACTIONS

CNS - insomnia, headache

Drug/drug interaction - ↑Warfarin effect

Arthropathy/tendonopathy - rare

Acute renal insufficiency via crystalluria
Caveat use if increased creatinine

ORAL ANTIBIOTICS VS. GNBs AMOXICILLIN/CLAVULANATE

COVERAGE

GNBs - moderately broad

Streptococcus species

S. pneumoniae

MSSA (**not** MRSA)

Haemophilus influenzae

INDICATIONS

UTIs

RTIs

ORAL ANTIBIOTICS VS. GNBs: SULFA/TRIMETHOPRIM

Moderate spectrum & potency vs. GNBs

H. influenzae

Pneumocystis jirovecii pneumonia

Caveat: S. pneumoniae 20% resistant

Adverse reactions

Allergy - fever, rash

ARF - due to sulfa crystalluria

ORAL ANTIBIOTIC THERAPY OF COMMON INFECTIONS IN OUTPATIENT SETTING

IMPETIGO

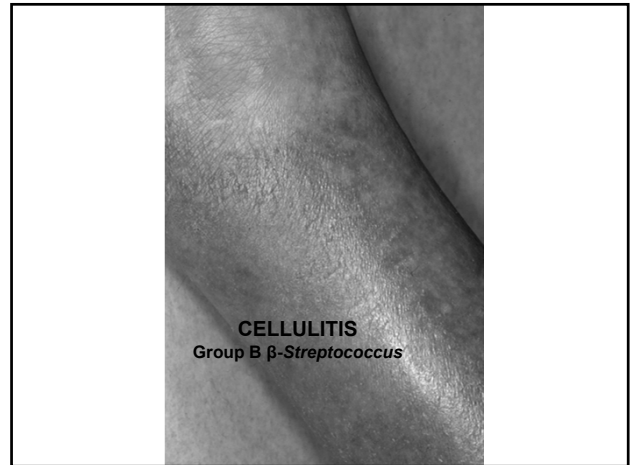
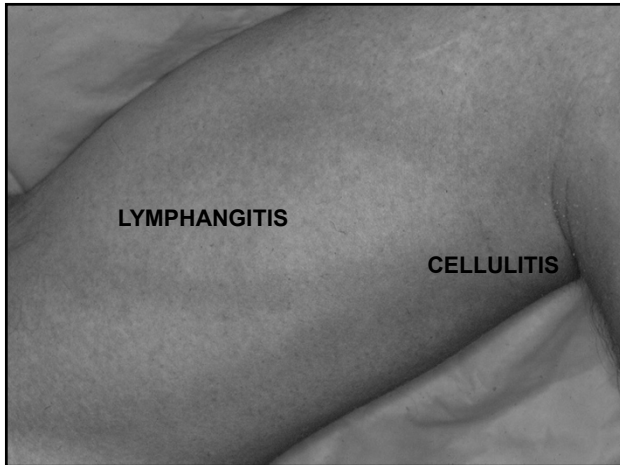
Staph. aureus > β -*Streptococcus*

honey-colored crusts

CARBUNCLES

(subcutaneously coalescent Furuncles)

Staph. aureus



ORAL ANTIBIOTIC RX SKIN & SOFT TISSUE INFECTIONS

If no pus/no wound/no foreign body = likely β -*Strep*.
Dicloxacillin (or Cephalosporin)

If pus +/- wound +/- FB = likely *Staph. aureus* (MRSA)
 β -lactam *plus* either **Doxycycline** or Sulfa/Tm

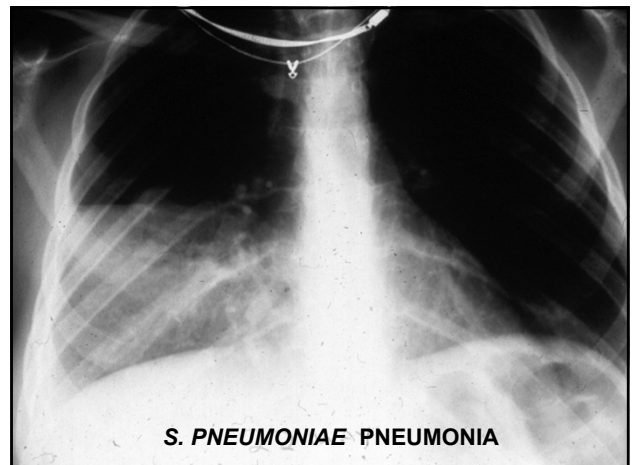
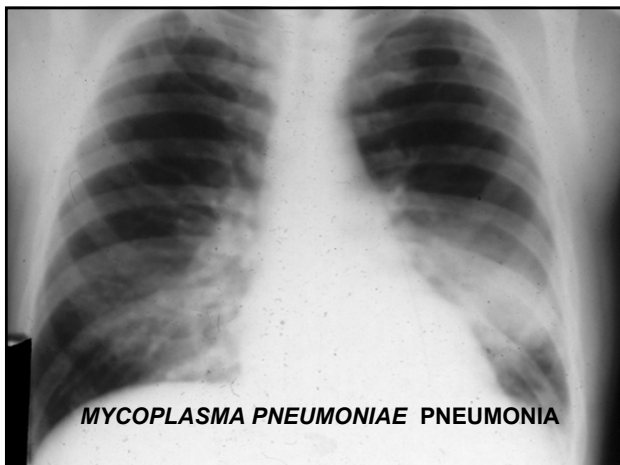
Animal bites

Cat bite (*Pasteurella multocida*)

Amoxicillin or Doxycycline or Fluoroquinolone

Dog bite (*P. multocida* & mixed flora)

Amox/Clavulanate & MRSA coverage



ORAL ANTIBIOTIC RX COMMUNITY-ACQUIRED PNEUMONIA

ATYPICAL (i.e., young & healthy; non-pyogenic)

Azithromycin *or*
Fluoroquinolone

TYPICAL (i.e., acute/toxic, likely *Strep. pneumoniae*)

ADD

2nd/3rd generation Cephalosporin *or*
Amoxicillin/Clavulanate

CONSIDER admission

ORAL ANTIBIOTIC RX OTITIS MEDIA/SINUSITIS

ACUTE/UNCOMPLICATED

Amoxicillin *or*
Sulfa/Trimethoprim *or*
Azithromycin

RECURRENT/COMPLICATED/RECENT ABx

2nd/3rd gen. Cephalosporin +/- Metronidazole *or*
Fluoroquinolone +/- Metronidazole *or*
Amoxicillin/Clavulanate

ORAL ANTIBIOTIC RX PHARYNGITIS

Rapid Strep Screen positive:

Amoxicillin *or* Pen VK *or*
Cephalosporin *or*
Clindamycin

Symptoms mild & RSS negative:

Await C/S

Symptoms severe & RSS negative:

Macrolide *or* Amoxicillin, pending throat culture

Recurrent Group A Streptococcus:

Clindamycin *or*
Amoxicillin/Clavulanate

ORAL ANTIBIOTIC RX URINARY TRACT INFECTION

Fluoroquinolone *if:*

Recent ABx, NOT a FQ

Alternatives:

Sulfa/Trimethoprim *or*
3rd generation Cephalosporin

Rx Duration

Cystitis X3-5 days
Pyelonephritis X10 days
Prostatitis X6 weeks (FQ)

ORAL ANTIBIOTIC RX STD GU INFECTIONS

Non-Gonococcal Urethritis (NGU)

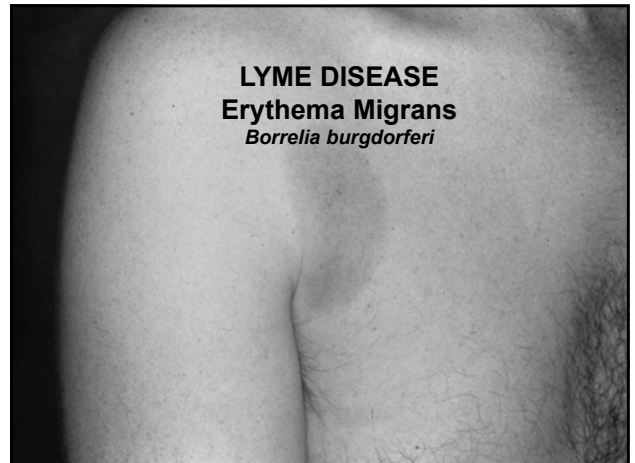
Azithromycin 1 gm x1 *or*
Doxycycline 100 mg bid x 7d *or*
Levofloxacin 500 mg add x7d

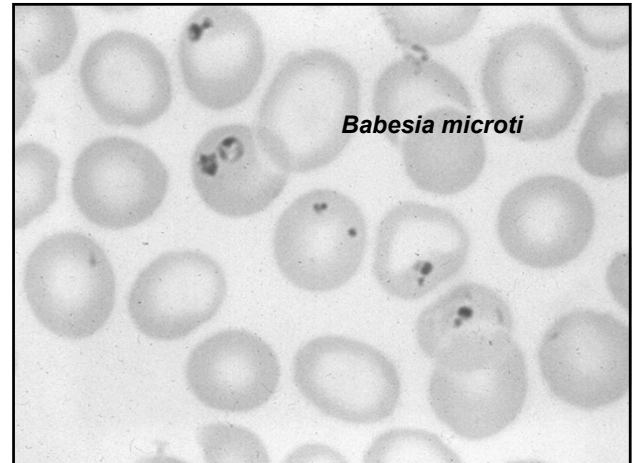
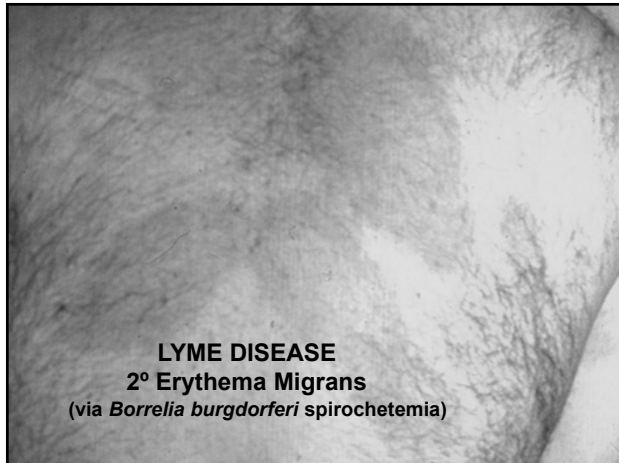
Gonococcal Urethritis

Ceftriaxone 250 mg IM X1
plus Azithromycin 1 gm *or*
Cefixime 200 mg x1
plus Azithromycin

N.B. - proof of cure re-testing @1 week)

LYME DISEASE
Erythema Migrans
Borrelia burgdorferi





ORAL ANTIBIOTICS RX TICK-BORNE INFECTIONS

LYME BORRELIOSIS

Doxycycline 100 mg bid X14-28d

ANAPLASMOSIS/EHRlichiosis

Doxycycline X7-10d

RICKETTSIOSIS

Doxycycline X5-10d after fever clears

BABESIOSIS

Atovaquone & Azithromycin (initially inpatient)

RX OF *C. DIFFICILE* COLITIS

Metronidazole (PO/IV)

Vancomycin PO (\$\$\$; less if reconstituted from IV)

Fidaxomicin PO (\$\$\$\$)

Rifaximin (if Vancomycin failure; \$\$\$)

Probiotics - live culture yogurt PO > encapsulated preps

Fecal reconstitution

Under FDA review

\$\$\$ & ?insurance coverage

ANTIBIOTICS CONTRAINDICATED IN PREGNANCY

Tetracyclines (including Tigecycline)

Fluoroquinolones

Clarithromycin

INFECTIONS NOT WARRANTING ANTIBIOTIC TREATMENT

Asymptomatic bacteruria

Catheter-associated bacteruria

Viral respiratory tract infections

Low-grade post-URI sinusitis symptoms

Post-Lyme Disease illness, after standard Rx

REFERENCES

Skin/Soft Tissue Infections

Stevens et al. Clin Infect Dis 2014; **59**:147

Pneumonia

Wunderink et al. NEJM 2014; **370**:543

UTIs

Gupta et al. Clin Infect Dis 2011; **52**:e103

Lyme Borreliosis

Stanek et al. Lancet 2012; **379**:461

Babesiosis

Vannier & Krause NEJM 2012; **366**:2397