

# Pearls and Pitfalls in Infectious Diseases for Primary Care Practitioners

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# Learning Objectives

1. Recognize syndromes or presentations of certain infections that may be frequently misdiagnosed ("What to think of when...")
2. Recognize some potential pitfalls primary care practitioners often face when encountering common infections, including rabies, fever in the returned traveler, community associated MRSA, food born illness, and the use of antibiotics

# Learning Objectives

3. Recognize and therefore avoid common, potentially serious mistakes when diagnosing soft tissue and bone infections
4. Review and then apply basic antibiotic pharmacokinetic and pharmacodynamic principles for achieving the best clinical outcome and the least chance for promoting resistance

# Outline

## I. Infections:

- Skin, bone, joint and soft tissue
- GI infections
- Bites/rabies
- Hospital acquired-health care associated  
Gram negative

## II. Antibiotic therapy

## Illustrative Case



## Illustrative Case

- 65 y/o AAF admitted for nonhealing heel ulcer
- Consulted for ABX recommendations
- 20 year history of diabetes; ulcer present for 2 years for which she had just completed 6 mo. of ciprofloxacin and ceftriaxone 1 week PTA;

- No systemic symptoms, no allergies
- Plain film 3 mo. PTA did not show changes suggestive of osteo
- 7 cm circular ulcer over L calcaneus, 2.5 cm deep, bone not visible, no pus, no odor

## Labs and X-ray

- WBC 8.8, Plt 441; ESR 45, CRP 0.8, GFR 79; Cr 0.8
- Large heel ulcer with changes of calcaneus c/ w neuropathic changes or osteomyelitis
- Swab of ulcer base = *Pseudomonas aeruginosa* sensitive to amikacin, tobramycin, gentamicin and imipenem,
- Resistant to 3<sup>rd</sup> gen cephs; sens to cefepime

## Approach & Treatment?

- Cefepime? Imipenem? No antibiotics? BX?
- Teaching points:
  - ESBL suggested by skipping generations of cephs; ask lab if they can do confirmatory test; avoid cephs even if sens
  - No rush to start ABX in these cases

## 'Diagnostic Value of Sinus Tract and Surface Cultures'

- Sinus tract cultures compared to operative specimens in 40 pts w/ chronic osteo
- 44% of sinus tract cx contain the operative pathogen
- *S. aureus* correlates with *S. aureus*
- Bacteria other than *S. aureus*, low likelihood of predicting pathogen
- Authors conclude bacteriologic DX of chronic osteo based on isolation of bugs other than *S. aureus* should be verified by operative cx

"Management of ischemic heel ulceration and gangrene: an evaluation of factors associated with successful healing"

- To determine effectiveness of tx of non-healing heel ulcers; ? Variable associated with success
- 91 pts present for 1-12 mo, 62% present longer than 3 mo
- Factors that did not influence outcome:
  - Diabetes or other cardiovascular disease
  - ABI

"Management of ischemic heel ulceration and gangrene: an evaluation of factors associated with successful healing"

- Variables statistically significant in predicting healing:
  - Normal renal function
  - Palpable pedal pulse
  - Patent posterior tibial artery past the ankle
  - # of patent tibial arteries past the ankle
- Some studies recommend primary BKA for 4-6cm dia, diabetes, renal failure

• [J Vasc Surg 2000;31:1120-8](#)

# Lab DX of Bone, Joint & Soft Tissue Infections

## Most important factors:

- 1: Collect in such a way as to avoid contamination by adjacent flora
- 2: Formalin, paraffin, ethanol, decalcifying agents, fixing agents
- 3: Submit tissue and fluid; NOT swabs  
Gram staining of tissue (not pus or fluid)  
insensitive

# Lab DX of Bone, Joint & Soft Tissue Infections

- Problems w/ swabs
  - More likely to be contaminated
  - Capture and release insufficient volumes of specimen
  - Inhibit growth of certain pathogens
  - Bacteria survive less well than in fluid or pus
  - Adherence may cause false negative on Gram staining
  - In 1 RCT of post op wounds: FNA superior to swab
    - [Ann R Coll Surg Engl 2007;89:166-7](#)

# Lab DX of Bone, Joint & Soft Tissue Infections

- Apparent viability of tissue...???
- Histopathology
  - Sufficient resection vs. sparing as much as possible
- How big a margin?
  - Research needed to determine the size of non-infected margins that predict outcomes
  - Whether involvement of margins by infection affects outcome
  - What type and duration of abx used to overcome margin involvement
- Nucleic acid amplification should not be used or ? (Elster Keiser paper)

# Lab DX of Bone, Joint & Soft Tissue Infections

## BONES:

- No single lab test
- Excisional bone biopsy whenever possible
- Adequate volume of specimen required
- Cultures of sinus tract specimens poor correlation with cultures of bone
- Serial CRP and ESR +/-

# Lab DX of Bone, Joint & Soft Tissue Infections

## JOINTS:

- Dilemma is overlap in clinical and lab findings in patients with infection and crystalline disease
- Fluids should be cultured with cell count differential, sensitivity of fluid gram stain low, aerobic cultures sufficient (usually), anaerobes very rare
- Most common pathogenic yeast grow well on routine culture media, so only rarely are fungal media necessary
- Blood culture bottles should not be used
  - No manufacture, fluid not available for staining, count, or crystal analysis
  - Neisseria should be inoculated to selective media at point of

## Illustrative Case

- A 32 yr old male presents with diffuse nontender adenopathy. What infection should be considered in the differential diagnosis?
- Single node

# Lymph Nodes

- Excisional biopsy for unexplained adenopathy
  - Divide node for histo, culture, flow, and cyto genetic
- No formalin - coordinate path, surgeon and microbiologist
- Frozen section of nodes discouraged
  - Contaminate cryo stats and missed dx due to freezing artifact

# Table

**Table 1. Causes of granulomatous lymphadenitis.**

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Class, species

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Bacteria

*Bartonella* species

*Francisella tularensis*

*Yersinia pestis*

*Yersinia pseudotuberculosis*

*Brucella* species

Mycobacteria

*Mycobacterium avium* complex

*Mycobacterium scrofulaceum*

*Mycobacterium bovis*

*Mycobacterium tuberculosis*

Fungi

*Histoplasma capsulatum*

*Sporothrix schenckii*

*Coccidioides immitis*

*Paracoccidioides brasiliensis*

Parasite

*Toxoplasma gondii*

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# Diagnostic Considerations for Skin

- Cellulitis
  - Usually clinical criteria alone
  - Needle aspirate low for Gram stain and culture
  - When important to know, do biopsy
  - Role of blood cultures unclear
    - Recommended:
      - Lymph edema
      - Buccal or periorbital
      - Chills and high fever
      - Fresh or salt water
      - Absence of previous ABX TX
      - Presence of > 2 co morbid factors
      - Duration < 2 days proximal limb involvement

# Vascular Disease: Ulcers

- No justification for superficial cultures
  - Typically grow mixed anaerobic aerobic flora
  - Reporting predominant species practiced, but little scientific basis
- B/C no way to determine whether a species is an etiologic agent or colonizing superficial flora
- Amputation:
  - 1) no way to predict whether an org will emerge as a cause of any subsequent infection

# Illustrative Case

- A 63 yr old male is brought to the ED because of a 1-day hx of rapid progressing pain, swelling, and erythema of his left hand assoc with chills, fever and delirium. The pt works in a restaurant in the Gulf Coast of Florida preparing seafood. One day ago he noted swelling of his left thumb from an area that was abraded by an oyster shell. The area quickly spread proximally and has now progressed beyond the elbow. Hemorrhagic bullae formed, the skin on the hand and arm darkened, and the pt became delirious. Medial Hx is unremarkable.
- On physical examination, the patient is awake but disoriented and is writhing in pain. Temp is 103.6, HR-122, RR is 24 and BP is 88/40. The left arm and hand show the changes described above. In addition, necrosis of the skin up to the upper arm has developed. The remainder of the exam is unremarkable.

# Necrotizing Fasciitis

- Infrequent but highly lethal
  - Despite low incidence, "NSTI occur often enough that surgeons, family physicians, internists will encounter it"
  - Commonly missed with catastrophic outcomes
- High litigation potential 14/16 awarded in favor of plaintiff
- DX greatest challenge

# Necrotizing Fasciitis

- Most important DX tool is high index of suspicion
- True risk factors not defined, anyone can get
- Association: DM immune suppression and obesity, injection drug use
- S&S: swelling, erythema, pain, tachycardia, tense edema outside area of compromised skin,  
**PAIN DISPROPORTIANT TO APPEARANCE**

# Necrotizing Fasciitis

- Late findings: ecchymosis, necrosis, crepitus, hypotension, shock
- Precipitous course = group A strep or Clostridium
- More insidious progression = other organisms
- WBC count  $> 15.4$ , Na  $< 135$ mmol/L
- LRINEC score - see Table 1 and 2

**Table 1. Six different variables included in the laboratory risk indicator for necrotizing fasciitis (LRINEC) score to help discriminate between necrotizing and nonnecrotizing soft-tissue infections.**

Value	LRINEC score, points
C-reactive protein, mg/L	
<150	0
>150	4
WBC count, cells/mm <sup>3</sup>	
<15	0
15–25	1
>25	2
Hemoglobin level, g/dL	
>13.5	0
11–13.5	1
<11	2
Sodium level, mmol/L	
≥135	0
<135	2
Creatinine level, mg/dL	
≤1.6	0
>1.6	2
Glucose level, mg/dL	
≤180	0
>180	1

**Table 2. Patient categories within the laboratory risk indicator for necrotizing fasciitis (LRINEC) score according to the likelihood of necrotizing soft-tissue infection (NSTI).**

Risk category	LRINEC score, points	Probability of NSTI, %
Low	$\leq 5$	<50
Intermediate	6–7	50–75
High	$\geq 8$	>75

# Necrotizing Fasciitis

- Imaging - plain x-ray for gas, specific but very insensitive
- Increased thickness of fascial layer on CT or MRI
- TX = early debridement
- When TX is only based on ABX therapy and support, mortality approaches 100%

# Necrotizing Fasciitis

- *S. pyogenes*, *Clostridium*, *S. aureus*
  - Micro DX very important b/c TX different
    - Beta lactam vs. vanc/linezolid/dapto
  - *S. pyogenes* = GPC short to long chains w/o cluster
  - *S. aureus* = grape like clusters or short chains
  - *Clostridium* = GPB

# Necrotizing Fasciitis

- ABX single
  - Imipenem, meropenem, ertapenem, PIP/TAZ or tigecycline
- Multidrug regimens
  - High dose pcn + clinda + quinolone or AG
  - Vanc, dapt, or linezolid should be included until MRSA ruled out
  - Protein synthesis inhibitors (clinda) help with inflammatory response

- Pyomyositis

- 70-95% *S. aureus*

- FNA or CT guided biopsy, or open ex bx

- MRI

## Illustrative Cases

- 6 patients in your clinic between 2001 and 2007 for traveler's diarrhea
- All visited high risk regions for TD
  - Peru, Bolivia, Cambodia, Myanmar, India, Morocco, and Kenya
- 4 patients with additional risk factors
  - Non bottled water, street vender food, staying in jungle areas
- All received antibiotic for acute diarrhea

## CDAD after ABX for TD

- Previously considered rare but increasing
- Mild symptoms may resolve without TX after withdrawal of initial ABX
  - May lead to under reporting/under appreciation
- All ABX linked to CDAD (HX cef and clinda)
- Think of especially following quinolone use
  - Quinolones still recommended as one of first line

# CDAD after ABX for TD

- Why it's important...
  - CDAD most common infectious etiology of nosocomial diarrhea
  - NAP1/027 hyper virulent
  - Current trend in ABX policies may be changing the epidemiology of disease
  - DX methods simple and inexpensive
  - Timely DX avoids unnecessary investigation and prevents complications

• *Clin Infect Dis.* 2008;46:1060-3.

## Illustrative Case

- 3 weeks of intermittent constipation and diarrhea
- Abdominal fullness, cramps relieved by defecation
- No blood / mucus, Labs and stool studies normal including WBC and O&P
- Returned from Mexico and Peru where had 2 episodes of TD
  - Fever, diarrhea, cramps, minimal vomiting
  - Pepto, Imodium no relief

# Post Infectious Irritable Bowel Syndrome

- After acute bacterial GE, up to 1/3 w/ prolonged GI complaints
- Portion of those effected will meet Rome III diagnostic criteria
- Patho phys chronic mucosal immunologic dysregulation with altered intestinal permeability and motility
- Both host and pathogen related factors involved

## Post Infectious Irritable Bowel Syndrome

- Risk factors
  - Duration of initial infection greater than 3 weeks is 11 fold higher
  - Younger age
  - Campylobacter and Shigella > Salmonella
  - Vomiting w/ initial infection decreases risk
- DX at least 2 of the following
  - Fever
  - Vomiting
  - Diarrhea
  - Positive stool culture

# Stool Cultures

- You order a routine stool culture...which of the following pathogens does your lab always test for?
- *Campylobacter*
- *Clostridium difficile*
- *E. coli* O157 hemorrhagic
- *Giardia lamblia*
- *Listeria*
- Norovirus
- Rotavirus
- *Salmonella*
- *Shigella*

# Emergency Care Physicians' Knowledge, Attitudes, and Practices Related to Surveillance for Foodborne Disease in the United States

Lyn James,<sup>1,3,a</sup> Rebecca Roberts,<sup>2</sup> Roderick C. Jones,<sup>1</sup> John T. Watson,<sup>1,a</sup> Bala N. Hota,<sup>2</sup> Linda M. Kampe,<sup>2</sup> Robert A. Weinstein,<sup>2</sup> and Susan I. Gerber<sup>1</sup>

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Who should receive a stool culture?

- A. Acute bloody diarrhea and fever
- B. Diarrhea who recently traveled to a developing country
- C. Employed as a cook in a restaurant
- D. Attends a daycare center

- Important teaching point:
- Primary care physicians forgot to do cultures when it was important for public health
- Crucial in the latter two scenarios b/c isolation = not only report to public health department but also high priority investigation

## Illustrative Case

- 46 y/o WF bitten on hand when removing 4 month old Husky from dead groundhog
- Dog received first rabies vaccine 4 days prior
- Ground hog taken to animal control
- Comes to you for advise
- Approach?

## Which is best COA?

- 1) Wound cleanse, reassurance, tetanus, observe for 10 days
- 2) Wound cleanse, tetanus, begin rabies vaccine series
- 3) Tetanus, begin rabies vaccine series co-administered with RIG at same site (arm or buttocks)
- 4) Td, RV in arm and RIG in buttocks

- Animals which never have rabies
  - Lagomorphs, squirrels, etc
- Animals which sometimes have rabies (case by case basis)...groundhogs
- Animals guilty until proven otherwise raccoons, foxes, bats
- Animal control: rabies confirmed in

## Which is best COA?

- 1) Wound cleanse, reassurance, tetanus, observe for 10d
- 2) Wound cleanse, tetanus, begin rabies vaccine series
- 3) Tetanus, begin rabies vaccine series co-administered with RIG at same site (arm or buttocks)
- 4) Td, RV in arm and RIG in buttocks
- 5) None of the above

## Answer

- Wash thoroughly with soap and water - most important
  - dT if needed
  - As much of RIG as possible **directly into the bite**
  - First vaccine series in deltoid
  - Remainder of RIG in separate site
  - Continue vaccine series weekly as per recs.
- 
- Returns 4 days later w/ S&S of wound infection
  - Wheezing and hives to PCN and Keflex

What is best choice for cat or dog bite wound in a PCN allergic patient ?

- Clindamycin ?
- Erythromycin ?
- TMP/SMX ?
- Doxycycline ?
- Ciprofloxacin ?

# e-Medicine & Monkey Bytes

- "This email is a request for advice for personnel aboard the USS *Leyte Gulf*. We received the initial email from the ship early Monday morning 15 May. Apparently, the ship was pier side in Gibraltar when several personnel were somehow exposed to these wild Barbary apes/macques."
- "Travax indicates that this specific area of free rabies, so other concerns include staph/strep, HSV Simiae, and other pathogens."
- "2 personnel so far have developed small, honey-colored vesicular, eruptions on erythematous bases at the sights of ape contact (one got a finger bite and the other one scratched on the anterior aspect of the upper and lower right arm)."



## Herpes B (Cercopithecine virus)



- Valacyclovir high dose indefinitely
- HA, missionary, adventure...
  - Consider ?? Don't forget PEP meds

# Illustrative Case

- 72 yr female nursing home resident is hospitalized because of urosepsis following developing of fever 2 day ago. It did not respond to empiric ceftriaxone, 1g IM q day. The pt has a chronic indwelling urinary catheter. She had a UTI 1 month ago and was treated with a short course of cipro. No urine cultures were obtained.
- On PE, pt is more confused then usual. Temp is 104 and HR 152 and regular, RR 38, and BP 80/50. Left flank pain is present. There are no focal neuro findings. WBC is 20,000 with 80% segmented neutrophils and 5% band forms. Urinalysis shows 4+ leukocytes and bacteria. A urine leukocytes esterase is positive. Urine cultures obtained in the nursing home are growing 100,000

- Which of the following is the **MOST** appropriate empiric IV antibiotic agent for this patient?
- (A) Imipenem
- (B) Ceftazidime
- (C) Ampicillin-sulbactam
- (D) Trimethoprim-sulfamethoxazole
- (E) Moxifloxacin

# Why UTI?

- HAIs are the most common adverse events encountered by hospitalized patients
- UTI is most common hospital acquired infection
- Most common condition for which ABX are prescribed
- Up to 16% have a catheter at some time
- Many acquire urinary infection while the catheter remains in place each day
- Prevention of hospital acquired infection received increased prominence by stakeholders.
  - Increasing no. of states require HAI reporting in QOC

# UTI

- No pyuria = UTI highly unlikely
- **First step...remove the catheter ASAP**
- For simple uncomplicated
  - 3 days ABX better than 7-10 and also better than 1
    - Contra's to short course
      - DM
      - Pyelonephritis
      - recurrent infections
      - bladder instrumentation,
      - recent ABX use
      - pregnancy

# Preventing HA-UTI

- Which have evidence supporting their role:
  - Catheters only when needed
  - Reminder systems for removal
  - Antimicrobial catheters in patients at highest risk
  - External or condom style catheters
  - Portable US scans to detect post void residual
  - Maintaining proper insertion technique
  - Antimicrobial agents in the drainage bag
  - Bladder irrigation
  - Rigorous frequent meatal cleaning
    - *Clin Infect Dis* 2008;46:243-50.

# Preventing SSIs

- Chlorhexidine = antiseptic solution 1950 broad antiseptic
- Disrupts cell wall
- Available in variety of concentrations (0.5% - 4%)
- Gram positive, gram negative, anaerobes, yeasts, and some lipid enveloped viruses including HIV
- Not sporicidal

## Which has/have strong evidence supporting use in infection control?

- Chlorhexidine preps for
  - CVC site preparation .
  - Outbreak control of MRSA
  - Reduction of skin flora.
  - Reduction of surgical site infections
    - *Clin Infect Dis.* 2008;46:274-81.

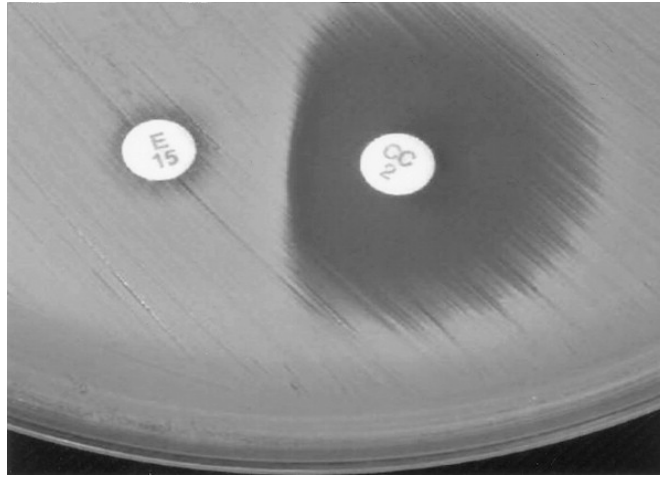
What is CA-MRSA?

# Difference between CA-MRSA and HA-MRSA

- Community isolates:
  - Usually susceptible to more ABX
  - Harbor novel MR cassette gene element
  - Occur in patients w/ no or different risk factors
    - Children, inmates, fencers, military, football players, IVDA, HIV, homeless
  - Have higher replication rates
  - More fit, displace HA isolates, or skin flora
  - More likely to encode putative virulence factors (PVL)

**Table 1. Comparison of community-associated and health care-associated methicillin-resistant *Staphylococcus aureus* (MRSA).**

Characteristic	Community-associated MRSA	Health care-associated MRSA
Susceptibility, <sup>a</sup> drug		
Chloramphenicol	Usually susceptible	Frequently resistant
Clindamycin <sup>b</sup>	Usually susceptible	Frequently resistant
Erythromycin	Usually resistant	Usually resistant
Fluoroquinolone	Geographic variability	Usually resistant
TMP-SMZ	Usually susceptible	Usually susceptible
SCC <i>mec</i> type	IV	II
Lineage	USA 300, USA 400	USA 100, USA 200
Toxin-producing	More	Fewer
Panton-Valentine leukocidin-producing	Common	Rare
Health care exposure	Less frequent	More frequent



- Double-disk diffusion test for inducible, erm-mediated resistance to clindamycin
- Flattening of the clindamycin zone between the disks is indicative of inducible resistance to clindamycin

# Treatment Considerations

- Linezolid and Synercid prohibitively expensive
  - [NEJM 2005;352:1485-7](#)
- Vanc preferred for empiric coverage and definitive TX but it may not remain so
  - Less anti-staphylococcal activity than PCNs
  - Increased use exacerbate problem of VRE
- Inexpensive agents tmp-smx, doxy, clinda, e-mycin
- Surgical drainage often enough regardless of whether on not susceptible ABX
  - [Arch Surg 2004;139:947-953.](#)

## Illustrative Case

- 2 days after you attend Cubicin sponsored lecture/CME...
- 21 yo female w/ CAP; rapid flu test+
- Worsening to point of admission
- Increasing BUN, ESR, CRP,
- 91-92% on RA
- Numerous sputum w/ heavy MRSA
- Pitfall?

# CA- MRSA Pneumonia

- 2003-2004 flu season, 17 cases in 9 states
  - Median age 21yrs (8mo.- 62yrs)
  - 16 hospitalized ( 13 in ICU)
  - 8 required intubation, 6 thoracostomy drains
  - 5 died (29%)
- All strains sensitive to rifampin and Bactrim
- Consider adding Bactrim to empiric guidelines for CAP in healthy pt post flu
- **NO DAPTO**
  - IDSA 2004 Annual Meeting. Abstract LB-8.

# Tx for CA-MRSA SSTI

- Purulent furunculosis - not simple cellulitis
- Drainage alone often enough
- Towels, soap, pet? 3 weeks TMP-SMX w/ mupirocin at end
- Erythromycin, Doxy, Clinda, TMP-SMX first line
- Linezolid, daptomycin, dalbavancin second line
- Cytopenias, neuropathy,
- SEROTONIN SYNDROME
  - with TCAs, SSRIs, triptans,
- What about vancomycin?

# Antibiotics: Vancomycin is Obsolete

- Became DOC because there were no other options
- Not subject to same pre approval scrutiny
- Poor penetration
- Weak antibacterial activity
  - Not overcome by dose escalation or combination
  - Raising trough to 15-20 ug/ml not encouraging
    - No correlation b/t trough [ ] and outcome

# Antibiotics: Vancomycin is Obsolete

- No evidence for benefit of adding gent; does cause more toxicity
  - Adding rifampin prolonged bacteremias
- No trials suggest superiority over any comparator - some evidence for inferiority -including dalbavancin
- Evidence exists that for MSSA bacteremia and endocarditis Vanc is inferior to some B lactams
  - Clin Infect Dis 2007;44:1543-5.

# Vancomycin is not obsolete

- MIC break points too high
  - Should be  $\leq 2$  not 4
- Doses incorrect
  - Should use load of 15-20 mg/kg
- Manifestation of more difficult to treat infections and more difficult bugs
- Metro and vanc equally effective for mild CDAD, but vanc may be superior for severe CDAD

## Optimum application of GN ABX and dosing of aminoglycosides

- Infections with gram negative increasingly common and difficult
- Bad bugs - no drugs
- None in pipeline
- Preserve treatment options

- **ABX resistance a huge problem**
  - 3 general categories
  
  - Measures that may prevent resistance in some species may exacerbate the problem in others
  
- **Strategies**
  - Blast them
    - More antibiotics leads to more resistance
  - Fool them
    - No compelling data support cycling
    - Cycling difficult to enforce
    - Also patient intolerance
  - **Stop irritating them**

- 3 points when this can occur
  - Before: treating only those patients that are truly infected
  - During: avoiding the use of combination when a single will do
  - At the end: treating only as long as required to cure
  
- Problem = we don't know how long
  - Poor supporting evidence other than the following:
    - UTI
    - STD
    - Endocarditis
    - TB
    - HIV
  
- Cellulitis, osteo, meningitis, lower extremity infection=???

# Applying PK and PD of ABX for Best Outcome

- Rate of killing maximized at low multiple of MIC
  - $\beta$ -lactams
  - Achieving higher [ ] does not result in > cell killing
- Best therapeutic results obtained by using smaller doses more frequently for any daily dose
- [ ] dependent killing
  - Aminoglycosides, fluoroquinolones, macrolides
- Largest possible single dose best

# Rational Use of Antibacterials

- Minimize collateral damage
  - Use ABX only when needed
  - Use the right (least) ABX for the shortest possible time
  - Probiotics ?
- Maximize outcome
  - Use the correct dose and interval
  - Some combinations antagonistic

## Top 12 Most Frequently Asked Questions

### What Should I Do?:

1. My patient has Candida in his urine.
2. My patient has Candida in a blood culture.
3. My patient has VRE in his urine.
4. My patient has diarrhea and VRE is his stool.
5. My patient has a bad cellulitis but has anaphylaxis

## Top 12 Most Frequently Asked Questions

6. I just admitted my patient with HIV on antiretroviral treatment (ART). Should I hold medicines until we figure out why he's sick?

7. My patient has *Candida* in her blood cultures. How serious is that?

8. Can I keep this central line?

9. Who needs meningococcal prophylaxis?

## Top 12 Most Frequently Asked Questions

10. In neutropenic patient with an indwelling central line and persistent fever despite antibiotics, a single positive blood culture for candida spp. may be treated by the removal of the offending indwelling catheter alone. True or false?
11. When should I treat chronic decubitus ulcers with antibiotics?
12. Our patient with neutropenic fever is still neutropenic, still has a fever, and has been on

## What to Think of When

- Elderly, dwindles, fevers, ↑ ESR, renal insufficiency
- Urethral DC from CA, HI, or SEA
- Teenage female for Planned Parenthood Clinic
- Fever in returned traveler with GI symptoms
- Diarrhea in returned traveler treated with ABX
- Diarrhea, constipation, abdominal pain following TD

# What to Think of When

- Construction worker with minor skin wound, repeated visits, back pain, shoulder pain, +/-pain at wound, no fever
- Lipo-tourist with weeping skin abscesses
- Patient on tnf-inhibitor with cough and fatigue
- Refractory anal ulcer in MSM
- Fever, low platelets, elevated LAE

# Helpful Articles/Further Reading

- Laboratory diagnosis of bone, joint, soft-tissue, and skin infections. *Clin Infect Dis.* 2008;46:453-7.
- Necrotizing soft-tissue infection: diagnosis and management. *Clin Infect Dis.* 2007;44:705-10.
- Post infectious irritable bowel syndrome. *Clin Infect Dis.* 2008;46:594-9.
- The challenges posed by reemerging *Clostridium difficile* infection. *Clin Infect Dis.* 2007;45:222-7.
- The Maxwell Finland lecture: for the duration - rational antibiotic administration in an era of antimicrobial resistance and *Clostridium difficile*. *Clin Infect Dis.* 2008;46:491-6.

# Helpful Articles/Further Reading

- Antibiotic Essentials 2010. 9<sup>th</sup> edition. Ed: Burke A. Cunha.
- HIV Essentials 2010. 3<sup>rd</sup> edition. Ed: Burke A. Cunha.
- The Washington Manual. Infectious Diseases Subspecialty Consult. Ed: Richard Starlin.
- Infectious Disease Secrets: Questions you will be asked...on rounds, in the clinic, on oral exams. Ed: Robert H. Gates. (Many DOs are chapter authors)