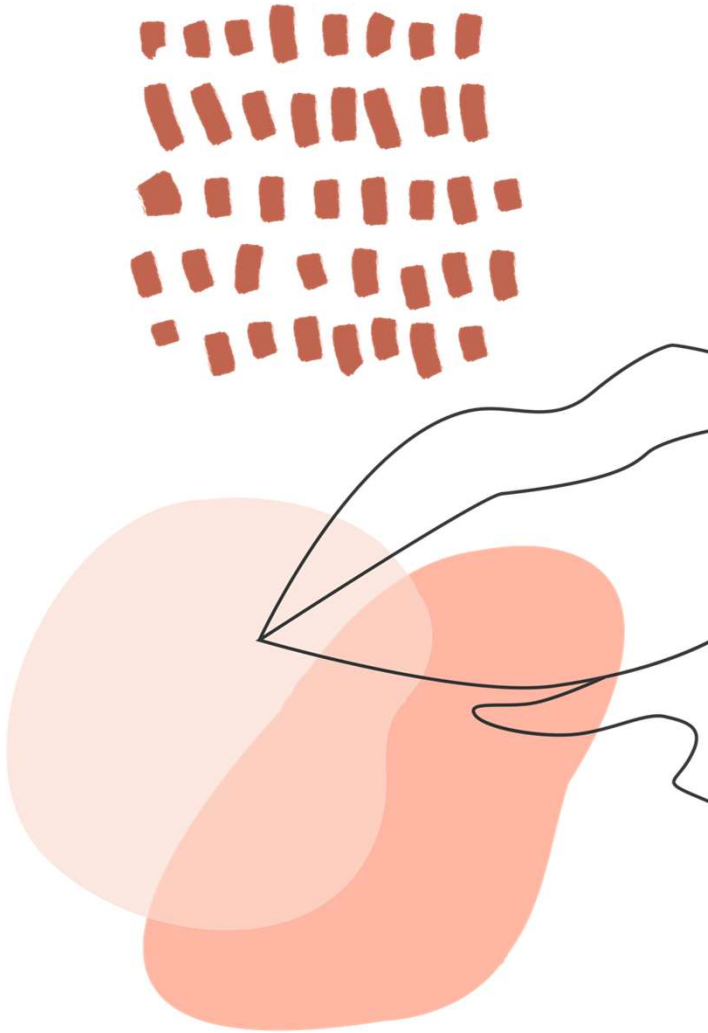
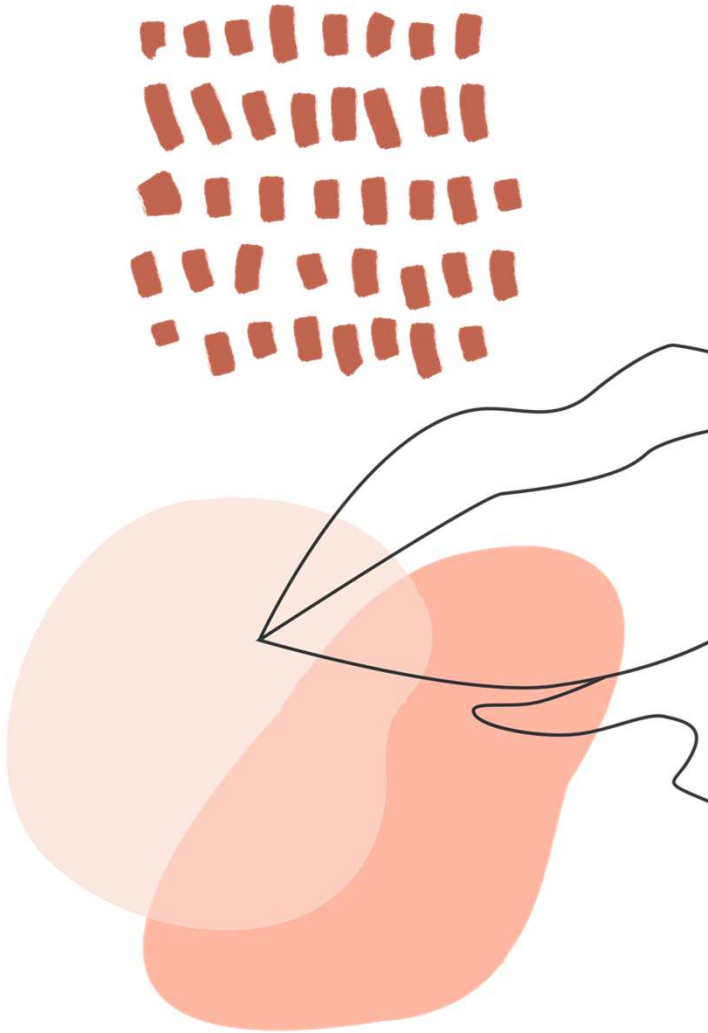
# INFECTIOUS DISEASES PEARLS FOR THE "CULTURED" HOSPITALIST

RACHEL HENDRYX, PA-C



# Disclosure statement

I have no relevant relationships with Ineligible companies to disclose within the past 24 months. (Note: Ineligible companies are defined as those whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.)



# OBJECTIVES

At the conclusion of this session participants should be able to:

- Recognize hospital medicine specific ID pearls and clarify common mistakes or misunderstandings regarding obtaining and interpreting microbiology data
- Describe specific principles when choosing an anti-infective: side-effects, interactions, doses, delivery, etc.
- Recall ID-specific resources to reference in daily clinical use

# A QUICK MICROBIOLOGY REVIEW

## OBTAINING GOOD CULTURES

- All cultures BEFORE antibiotics
- Blood: 2 sets, 2 separate sites, within one hour ideally
- Urine: UA always, clean catch, exchange foley, straight cath or from stoma aka at the source
- Respiratory: engage RT early
- CSF: Cell counts, cytology
- Pleural: Cell counts, cytology
- To swab or not to swab?

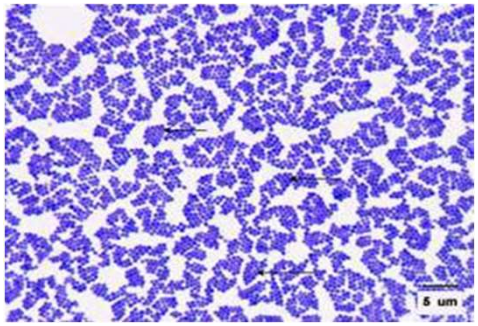
## THE GRAM STAIN

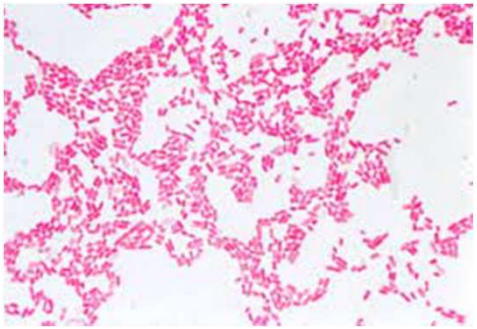
- Gram stain does not equal growth on cultures
- Gram stain does not always translate to true pathogenic infection, i.e. mixed respiratory flora.
- Are there heavy PMN's?

## CONTAMINANTS

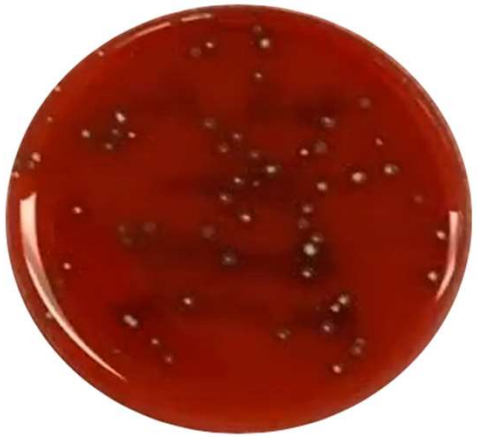
- It begins with step one: obtaining good cultures.
- Know your common skin colonizers
- Yeast in urine and respiratory cultures often colonization
- Colonization vs. contamination
- Transient bacteremias

# MICRO LAB: BEHIND THE SCENES

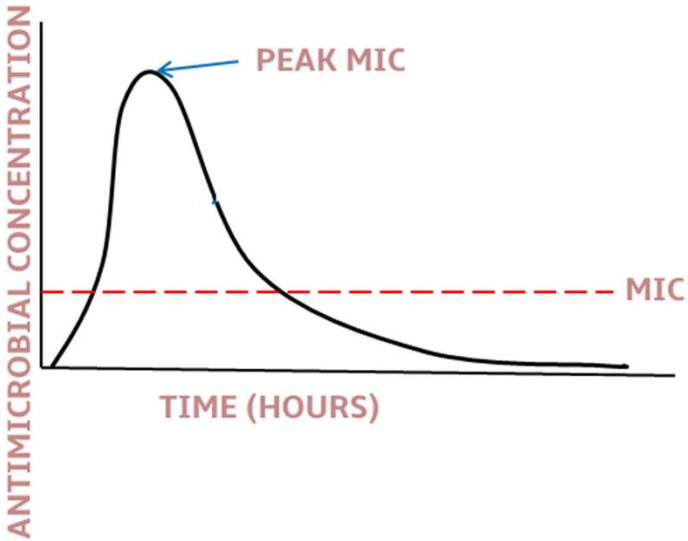


Gram stain: A sample is looked at under a microscope after having a stain applied.



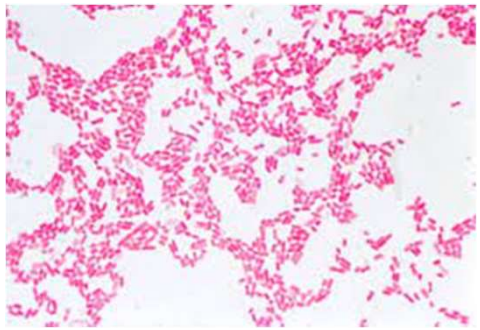
Culture: Bacteria, yeast, etc. from the sample are grown and examined to help determine the pathogen

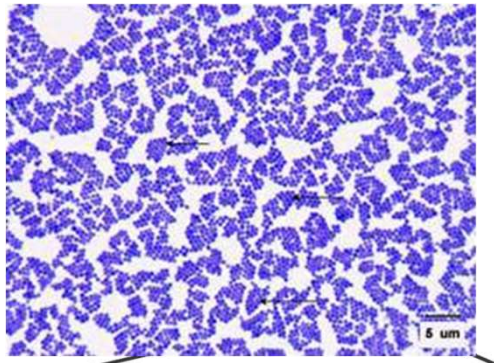



Sensitivity: This determines which drug is best for treating the infection.

# MICRO LAB: THE GRAM STAIN

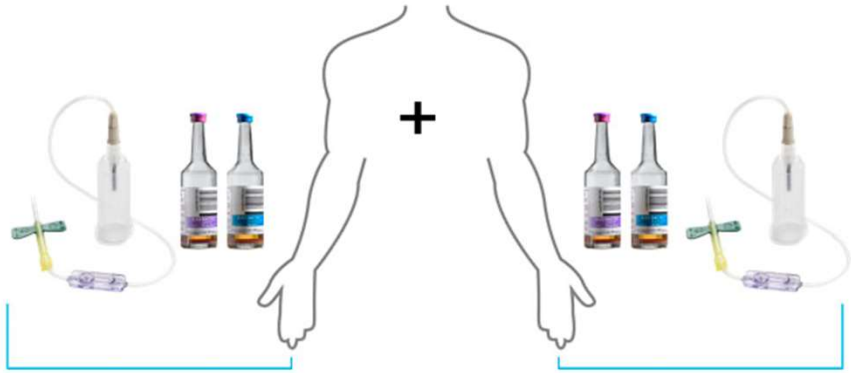
- Gram stain does not always translate to growth on culture media, and likewise growth on cultures does not always equate to pathogenic infection
- Are there heavy PMN's? – increased PMN's can infer inflammatory/infectious response. Few PMN's making this less likely
    - Example: Respiratory gram stain shows few GPC's and GNR's, few PMN's. culture = mixed respiratory flora





# A QUICK MICROBIOLOGY REVIEW: BLOOD CULTURES

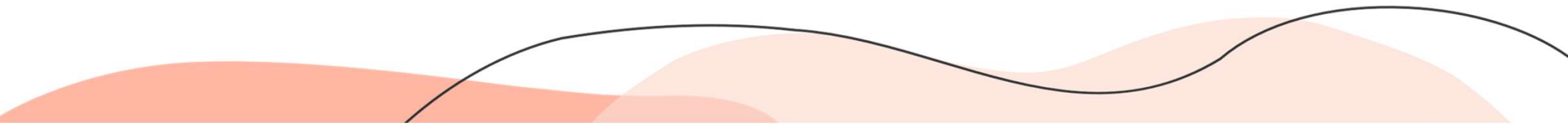
- A blood culture set is defined as **two bottles, an aerobic bottle and an anaerobic bottle.** Two blood culture sets (a total of 4 bottles) should be drawn
- Reminder: ALWAYS specify in EMR order to draw one set from Ports, PICC's, etc.
- Always draw before starting antibiotics
- Always order 2 sets, they need to be drawn ideally within one hour from each other and from 2 separate sites
- 2/2 sets positive = at least one bottle from each set is positive
- Don't be confused by micro reports, "2/2 bottles positive" = one set positive (institution specific)




ALWAYS OBTAIN ONE SET FROM CENTRAL LINE WHERE APPLICABLE WITH SECOND SET FROM PERIPHERY.

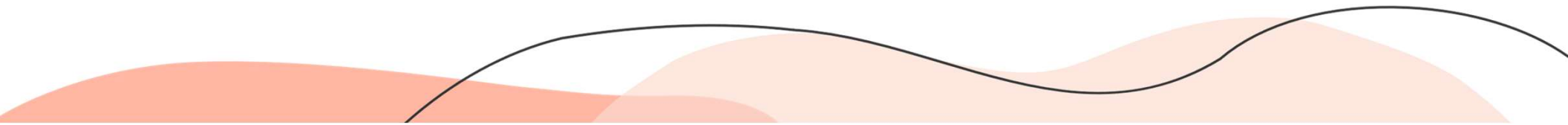
# A QUICK MICROBIOLOGY REVIEW: URINE CULTURES

- NEVER draw from old bag (nephrostomy, foley, etc.)
- Draw from stoma, after foley exchange, after SPC exchange etc.
- Remember to document when the foley was exchanged and if urine obtained post exchange
- Don't forget the UA (asymptomatic bacteriuria, or bacterial growth on urine culture in setting of negative UA for instance shouldn't infer automatic infection)



# A QUICK MICROBIOLOGY REVIEW: RESPIRATORY CULTURES

- Engage RT early to avoid delays
- Hospital specific: AFB Order sets to r/o TB
- Remember: positive gram stain does not equate to positive cultures
  - Multiple isolates on gram stain commonly speciate to mixed respiratory flora
    - If micro lab notes a pseudomonas, staph aureus and few others will be denoted as such and not combined with mixed respiratory flora



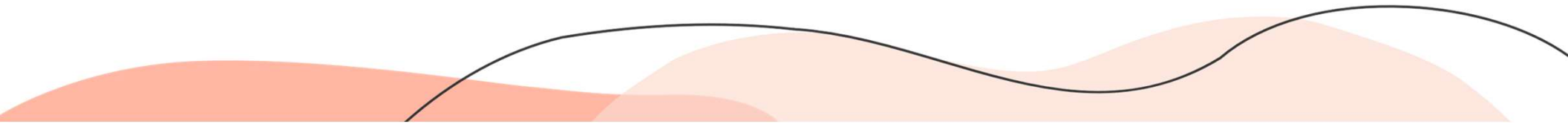
# A QUICK MICROBIOLOGY REVIEW: PLEURAL, PERITONEAL, CSF ETC.

- Always draw fluid for cell counts, glucose, protein, cytology, etc and not just cultures. Often cannot rule out contamination in absence of these markers
- Doesn't hurt to save extra CSF for add-on tests pending ID consult / further recommendations

- IR CULTURES
  - Typically need anaerobic, aerobic and fungal cultures (sometimes AFB?). Don't expect IR to place the orders. It may be your responsibility as a hospitalist to make sure cultures are ordered *prior to the procedure!*
  - Another reminder NOT to draw cultures off an existing drain bag. Only reliable cultures obtained during drain placement or exchange

# A QUICK MICROBIOLOGY REVIEW: CONTAMINANTS, COLONIZERS

- Distinguishing colonization from infection is an important factor in making the correct diagnosis
- Improperly obtained cultures can lead to mis-diagnoses and lengthy / expensive / invasive workups (TEE, prolonged antibiotic durations, CT scans etc.)

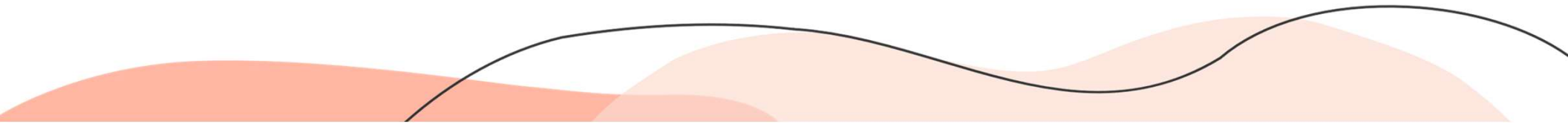


# A QUICK MICROBIOLOGY REVIEW: CONTAMINANTS, COLONIZERS

| COMMON SKIN CONTAMINANTS | COMMON URINE CONTAMINANTS | COMMON RESPIRATORY CONTAMINANTS |
| --- | --- | --- |
| • Coagulase negative staph species (CoNS)<br>  ○ exception: staph lugdunensis<br>• Corynebacterium species<br>• P. acnes<br>• Bacillus species (not anthracis) | • Yeast<br>• Staph aureus = concerning for bacteremia / deep seeded infection<br>• Other skin colonizers that aren't staph aureus | • Yeast (typically, but not always, other markers like beta d glucan, aspergillus galactomannan also helpful) |

# A QUICK MICROBIOLOGY REVIEW: CONTAMINANTS, COLONIZERS

- Staph aureus in blood cultures almost never considered contaminant (risk of not treating is too high)
- Yeast in blood cultures is never a contaminant
- Joint aspirates, CSF cultures, etc. similar contaminants as skin colonizers on previous slide: again very important to get cell counts for correlation



# SHOULD I SWAB IT? (PROBABLY NOT)

- Skin swabs = Contaminants / colonizers
- Okay to swab If you can unroof a lesion or drain the abscess for a fresh sample

# A QUICK MICROBIOLOGY REVIEW: SUSCEPTIBILITIES, BREAKPOINTS

- A reminder MIC = **minimum inhibitory concentration, or minimum medication needed to inhibit bacterial or fungal growth**
- MIC(aka breakpoint, cutoff) vary from facility to facility based on local isolates and their respective sensitivities
- Not every antibiotic is tested, clinicians must infer certain types of antibiotic susceptibility based on bacterial patterns of resistance and sensitivities of other antibiotics
- Many isolates may report susceptible but be at high risk for developing resistance or already has, i.e. Amp-C inducers, if a patient is very sick of at risk of resistance keep this in mind

GSBLD CX — Gram negative rods

Resulting Agency: AMC Lab

Susceptibility

| | Escherichia coli<br>AUTOMATED SUSCEPTIBILITY (PHOENIX) | |
|---|---|---|
| Amoxicillin/Clavulanic | <=4/2 ug/mL | Susceptible |
| Ampicillin | >16 ug/mL | Resistant |
| Ampicillin/Sulbactam | 8/4 ug/mL | Susceptible |
| Aztreonam | 8 ug/mL | Intermediate |
| Cefazolin | >16 ug/mL | Resistant |
| Cefepime | 4 ug/mL | Intermediate |
| Cefoxitin | 8 ug/mL | Susceptible |
| Ceftazidime | 4 ug/mL | Susceptible |
| Ceftazidime/Avibactam | <=0.25/4 ug/mL | Susceptible |
| Ceftriaxone | 32 ug/mL | Resistant |
| Ciprofloxacin | 0.5 ug/mL | Intermediate |
| Ertapenem | <=0.25 ug/mL | Susceptible |
| Gentamicin | <=2 ug/mL | Susceptible |
| Levofloxacin | <=0.5 ug/mL | Susceptible |
| Meropenem | <=0.5 ug/mL | Susceptible |
| Meropenem/Vaborbactam | <=2/8 ug/mL | Susceptible |
| Minocycline | 4 ug/mL | Susceptible |
| Piperacillin/Tazobactam | <=2/4 ug/mL | Susceptible |
| Tetracycline | >8 ug/mL | Resistant |
| Tigecycline | <=1 ug/mL | Susceptible |
| Trimethoprim/Sulfamethoxazole | <=0.5/9.5 u... | Susceptible |

# MICRO LAB BEHIND THE SCENES: MIC TESTING

**MIC Microbroth dilution**

**MIC Disks**

# ANTIBIOTIC (OR ANTIFUNGAL/ANTIVIRAL) SELECTION

| ALLERGIES | DELIVERY | INTERACTIONS | RESISTANCE | EXPOSURES | PENETRATION /DOSE | DURATION |
|---|---|---|---|---|---|---|
| Childhood allergy?<br>Cross-Reactivity<br>Side-chains | IV vs. PO<br>Absorption<br>Volume status<br>Bio-availability | Home meds | Local antibiogram<br>Hx of resistance? | Hospital acquired<br>Environmental<br>Workplace<br>Housing insecurity, etc. | CNS<br>Bone<br>Urine<br>Endocarditis | Guidelines, case reviews, Up to Date etc. can be helpful |

# ANTIBIOTIC SELECTION: START WITH ALLERGIES

- First thing to consider when selecting an agent: (for pretty obvious reasons) but always clarify the allergy severity and timeframe
- Did you know? About 10% of all people in the United States report having a penicillin allergy, but only 1% of those people actually have an allergy. Furthermore, patients are at risk of increased adverse outcomes with abx allergy labels
- Offer allergy testing inpatient if offered at your institution or referral on discharge followed by desensitization if available
- Not all antibiotics within the same class share the same allergy profile / cross-reactivity (different side chains)

| Similar side chains | Penicillin | Amoxicillin | Ampicillin | Cephalexin | Cefuroxime | Cefoxitin | Ceftriaxone | Cefotaxime | Cefepime | Ceftazidime |
|---|---|---|---|---|---|---|---|---|---|---|
| Penicillin | ■ | | | | | X | | | | |
| Amoxicillin | | ■ | X | X | | | | | | |
| Ampicillin | | X | ■ | X | | | | | | |
| Cephalexin | | X | X | ■ | | | | | | |
| Cefuroxime | | | | | ■ | X | X | X | | |
| Cefoxitin | X | | | | X | ■ | | | | |
| Ceftriaxone | | | | | X | | ■ | X | X | X |
| Cefotaxime | | | | | X | | X | ■ | | X |
| Cefepime | | | | | | | X | | ■ | |
| Ceftazidime | | | | | | | X | X | | ■ |

- chart courtesy of Meghan Jeffres pharmD

# ANTIBIOTIC SELECTION: DELIVERY

- Do I need IV?
  - Critically ill patients
  - Is the patient NPO or at risk of aspiration?
  - Any concern for GI absorption ability? Short gut syndrome, hx of gastric bypass etc. (typically if the abx has rapid absorption, still okay for PO but not extended release, delayed release, etc.)
  - Do I have concerns about their volume status and unnecessary fluid burden?
  - Bio Availability
    - Many agents are equally bio-available whether IV or PO. Always prefer PO if none of the above are concerns
  - Penetration sites, IV may be necessary vs dose adjustment or both

# ANTIBIOTIC SELECTION: MORE ON BIO-AVAILABILITY

- **COMMON AGENTS THAT ARE EQUALLY BIO-AVAILABLE IV VS. ORAL**

| ANTIBIOTICS | ANTIFUNGALS | ANTIVIRALS |
|---|---|---|
| • Fluoroquinolones: **Moxifloxacin**, Levofloxacin, Ciprofloxacin but need to adjust dose<br>• **Metronidazole**<br>• **Bactrim**<br>• **Linezolid** | • Azoles: i.e. Fluconazole, Voriconazole | • **None** |

# ANTIBIOTIC SELECTION: INTERACTIONS / RISK FACTORS

- Typically EMR will flag this for you but good to remember common interactions:
- Medications that lower seizure threshold in epileptics or someone at risk for seizure (i.e. brain tumor, mass effect, etc.) (4$^{th}$ generation cephalosporins, carbapenems, quinolones, Unasyn)
- Serotonin syndrome (particularly with linezolid)
- QTc prolonging agents (fluoroquinolones, azoles, macrolides)
- Warfarin and most antimicrobials
- Encephalopathy: carbapenems, cefepime (reversible so don't necessarily avoid therapy with this in patients at risk for AMS, can always change therapy as needed if concerns present)
- Vascular disease (increased risk of aortic dissection with quinolones)
- Alcohol use (avoid metronidazole)
- Remember antibiotics can lower efficacy of contraceptive pills

# ANTIBIOTIC SELECTION: EXPOSURES

- Am I treating a hospital or community acquired infection?
  - Do I need to be worried about pseudomonas or MRSA?
- Does the patient have hx of resistance / MDR's? How long ago?
- Local resistance – utilize your facility antibiogram
- Environmental exposures
  - Is Listeria a concern?
  - Mycobacterial infections: save your antibiotics to reduce risk of resistance
  - Risk of invasive or atypical fungal infections? (soil / livestock exposures, patient is immunocompromised, etc.)

# ANTIBIOTIC SELECTION: PENETRATION / DOSE

- BONE PENETRATION
- CNS / OCULAR PENETRATION
- URINE / RENAL PENETRATION
- PULMONARY

*Image from UCH Antibiogram

**CNS, Bone, and Urinary Penetration for Select Antimicrobial Agents**

| Drug | CNS Uninflamed (%) | CNS Inflamed (%) | Bone | Urine |
|---|---|---|---|---|
| **Beta-Lactams - Penicillins** | | | | |
| Penicillin G/V | Low | Moderate (30) | N/A | Excellent |
| Nafcillin | Low (1-2) | Moderate (20-30) | Moderate | Good |
| Ampicillin | Low (1.6) | Moderate (39) | Mod-Good | Good |
| Sulbactam | Low (7) | Low (10) | Mod-Good | Good |
| Amoxicillin | Low | Low (5.8) | Moderate | Excellent |
| Clavulanic Acid | Low (3.7) | Low (8.4) | Moderate | Excellent |
| Piperacillin / tazobactam[2] | Low (3.7/10.6) | Moderate (32) | Moderate | Good |
| **β-Lactams- Monobactam** | | | | |
| Aztreonam | Moderate | Moderate (13-18) | Moderate | Good |
| **β-Lactams – Cephalosporins** | | | | |
| Cefazolin[2] | Low | Low (9-10) | Moderate | Excellent |
| Cefotaxime | Low (9) | Moderate (17) | Moderate | Good |
| Cefoxitin[2] | Low (0-9) | Good (41-50) | Moderate | Good |
| Ceftriaxone | Low (0.7-2) | Moderate (20-35) | Moderate | Good |
| Ceftazidime | Low (2-8) | Moderate (36-40) | Mod-Good | Excellent |
| Ceftazidime-Avibactam[2] | N/A | N/A | N/A | Excellent |
| Cefepime | Low (8-10) | Moderate (20-34) | Good | Good |
| Ceftolozane-Tazobactam[2] | N/A | N/A | N/A | Excellent |
| Ceftaroline[2] | Low (3) | Moderate (15) | N/A | Good |
| **β-Lactams – Carbapenems** | | | | |
| Ertapenem[2] | ? | Low-Moderate | Moderate | Good |
| Meropenem | Moderate (5-25) | Good (39-75) | Moderate | Good |
| Imipenem/Cilastatin | Low | Moderate (14) | Low | Good |
| **Fluoroquinolones** | | | | |
| Ciprofloxacin[2] | Good (24-43) | Excellent (92) | Excellent | Excellent |
| Moxifloxacin[2,3] | Good (46) | Excellent (71-94) | Excellent | Low |
| Levofloxacin[2] | Good (71) | Excellent (>90) | Excellent | Excellent |

# ANTIBIOTIC SELECTION: DOSE

- Similar to choosing an antibiotic with specific sites of penetration, the dose may need to be altered depending on site of infection:
  - Endocarditis, Osteomyelitis, CNS infection, renal infection vs. UTI, etc.
- Don't forget patient's weight/age
- Trough levels: vancomycin for instance
- Renal function/HD/CRRT dosing, may need to frequently adjust dose based on renal function
- Augmented renal clearance: can check cystatin C for more accurate dosing
- MIC: some antimicrobials are dose dependent based on the MIC, ex: c. glabrata

# ANTIBIOTIC SELECTION: DURATION

- Simple guidelines do exist for common infections: pneumonia, SSTI, endocarditis, bacteremias, CNS infections. A quick UptoDate check can be helpful, case review for less documented infections.
- Do I have source control? Typically first day of appropriate therapy is when source control is achieved, example: I&D, surgical washout, line removed, etc.
- Many guidelines don't exist: when in doubt choose an even number (*joking-ish)

# ANTIBIOTIC SELECTION: NARROW AS ABLE!

- Antibiotic-resistant superbugs = a looming health threat
- Bus are smart! Pathogens can genetically adapt themselves through repeated exposures to antibiotics
    - Repeated use of narrow spectrum antibiotics eventually lead to super bugs requiring broad spectrum antibiotics
- Set realistic antibiotic durations
- Narrow your regimen as quickly as able
- Judicious use of antibiotics: ex: asymptomatic bacteriuria vs UTI vs. colonization, etc.

# AS AN FYI: A FEW ID RESOURCES WE LIKE:

| APPS | ANTIBIOGRAMS | PHARMACISTS |
| --- | --- | --- |
| • John Hopkins Antimicrobial guide<br>• Sanford guide<br>• Case reviews<br>• IDSA practice guidelines<br>• CDC Provider resources | • Don't forget your local antibiogram | • Don't forget about antimicrobial stewardship!<br>  • Simple/initial/empiric antibiotic choice/dose/duration and when to narrow can be done by ID pharmacy |

# UCHealth AMC/BFH Antibiogram (1/1/2022-12/31/2022)

- Antibiogram example:

  This data is pulled from facility specific microbiology lab to assess local antimicrobial susceptibility patterns to help guide empiric therapy

**Gram Negatives: Community Acquired**
(Cultures obtained ≤48 hours from admission)

| Organism | n | Ampicillin | Amoxicillin-Clavulanate | Cefazolin | Ceftriaxone | Ceftazidime | Cefepime | Piperacillin-Tazobactam | Meropenem | Ertapenem | Levofloxacin | Amikacin | Tobramycin | Sulfamethoxazole-Trimethoprim | Nitrofurantoin[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Escherichia* spp | 1580 | 49 | 92 | 69 | 86 | 89 | 87 | 94 | 99 | 99 | 77 | 100 | - | 70 | 97 |
| *Klebsiella* spp | 338 | 0 | 90 | 70 | 90 | 92 | 91 | 86 | 99 | 99 | 90 | 99 | - | 84 | 54 |
| *K. pneumoniae* | 81 | 0 | 91 | 80 | 90 | 92 | 91 | 87 | 99 | 99 | 87 | 99 | - | 82 | 44 |
| *K. oxytoca* | 139 | 0 | 80 | 16 | 83 | 92 | 86 | 80 | 100 | 100 | 95 | 100 | - | 86 | 93 |
| *Enterobacter* spp. | 191 | - | - | - | 70 | 71 | 85 | 72 | 98 | 84 | 93 | 100 | - | 91 | 33 |
| *Proteus* spp. | 139 | 70 | 97 | 10 | 93 | 100 | 98 | 99 | 100 | 100 | 93 | 100 | - | 83 | 0 |
| *Citrobacter* spp. | 73 | 0 | 32 | 28 | 76 | 78 | 93 | 80 | 100 | 98 | 90 | 100 | - | 95 | 85 |
| *C. freundii* | 44 | 0 | 0 | 0 | 68 | 65 | 90 | 72 | 100 | 100 | 88 | 100 | - | 95 | 100 |
| *P.aeruginosa* | 225 | - | - | - | - | 88 | 76 | 88 | 88 | - | 76 | 98[1] | 99 | - | - |

**Gram Negatives: Hospital Acquired**
(Cultures obtained >48 hours from admission)

| Organism | n | Ampicillin | Amoxicillin-Clavulanate | Cefazolin | Ceftriaxone | Ceftazidime | Cefepime | Piperacillin-tazobactam | Meropenem | Ertapenem | Levofloxacin | Amikacin | Tobramycin | Sulfamethoxazole-Trimethoprim | Nitrofurantoin[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Escherichia* spp | 352 | 40 | 74 | 58 | 79 | 84 | 81 | 90 | 99 | 99 | 67 | 100 | - | 66 | 96 |
| *Klebsiella* spp | 229 | 0 | 84 | 62 | 85 | 87 | 87 | 81 | 97 | 96 | 90 | 99 | - | 83 | 54 |
| *K. pneumoniae* | 159 | 0 | 84 | 72 | 85 | 85 | 86 | 80 | 97 | 96 | 88 | 99 | - | 81 | 41 |
| *K. oxytoca* | 55 | 0 | 76 | 18 | 81 | 89 | 87 | 76 | 93 | 92 | 97 | 100 | - | 83 | 100 |
| *Enterobacter* spp. | 179 | 0 | 0 | 0 | 62 | 63 | 78 | 61 | 95 | 78 | 95 | 100 | - | 91 | 27 |
| *Proteus* spp. | 64 | 73 | 95 | 9 | 92 | 98 | 98 | 100 | 100 | 100 | 84 | 100 | - | 84 | 0 |
| *Citrobacter* spp. | 59 | 0 | 27 | 18 | 59 | 59 | 77 | 55 | 100 | 96 | 90 | 100 | - | 89 | 84 |
| *C. freundii* | 43 | 0 | 4 | 2 | 46 | 46 | 72 | 46 | 100 | 95 | 89 | 100 | - | 88 | 88 |
| *P.aeruginosa* | 183 | - | - | - | - | 89 | 79 | 87 | 87 | - | 81 | 100[1] | 97 | - | - |

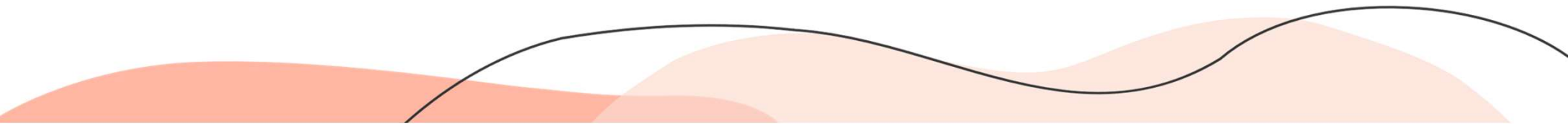
***Klebsiella (Enterobacter) aerogenes* is included with *Enterobacter* spp.
1: urinary isolates only

# Practice question #1

A 37yo F with no significant PMH presents to the hospital with abdominal pain, diarrhea, fever. Your leading diagnosis is simple viral gastroenteritis however you obtain blood cultures and she has one out of two sets with Gram Positive Clusters

What is your initial plan?

A. Wait until blood cultures are speciated before starting antibiotics
B. Defer antibiotics because this is probably a contaminant
C. Start IV Vancomycin
D. Start PO linezolid



# Practice question #2

A 68yo M with PMH BPH, HTN, CAD presents to the hospital with abdominal pain with associated nausea and vomiting. The patient is s/p lap cholecystectomy two weeks prior for cholelithiasis. His vital signs are notable for a tmax of 101.8F, HR 119, 93% on room air. Labs notable for a WBC of 19, normal lactate, Cr .95, normal LFT's. A CT a/p with contrast is obtained and demonstrates a 6cm x 8.5cm abscess in the cholecystectomy bed. IR has been consulted and plans to place a drain later today and obtain cultures.

What is your initial plan?

A. Defer antibiotic therapy until IR cultures have resulted
B. Start IV Ceftriaxone and IV flagyl
C. Start IV vancomycin / IV meropenem
D. Start IV Piperacillin/tazobactam
E. Start IV Unasyn
F. Start PO Augmentin

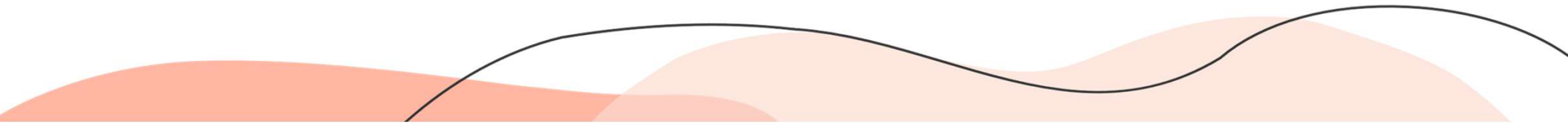
# Practice question #3

A 57 yo F with PMH of MS complicated by neurogenic bladder / chronic suprapubic catheter, recurrent UTI's presents with fevers, flank pain and foul smelling urine. You exchange her suprapubic catheter and obtain a urine culture, preliminary UA appears has +WBC, nitrites and leukocyte esterace. You find records from the last 6 months that demonstrate prior urine cultures for pan susceptible e. coli, pan susceptible pseudomonas. The gram stain of the urine demonstrates >100k Gram negative rods. What is your initial antibiotic choice?

A. PO Levaquin
B. IV Levaquin
C. IV Cefepime
D. IV Ertapenem
E. IV meropenem
F. IV Ceftriaxone

# Summarization

- Prioritize obtaining quality specimens for delivery to the microbiology lab, will avoid unnecessary, invasive and expensive workups.
- Consider multiple factors when choosing an anti-infective including allergies, IV vs. PO, dose, interactions, penetration, exposure history, duration. Use evidence based judgment to narrow patient's regimens in a timely and concise manner to avoid resistant super-bugs.
- Utilize common resources to help guide your diagnoses and subsequent management.



# Questions?

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