

**BACTEREMIA**

- Look for source and for evidence of complications
- Repeat Blood Cultures
- Consult ID if *S. aureus*, *Candida*, or other concerns

**OSTEOMYELITIS**

- If clinically stable, do not start empiric antibiotics; get a culture first
- There are better outcomes with pathogen directed therapy

**Pneumonia**

- New infiltrate
- Evidence suggesting Infectious Etiology
  - Fever, Purulent sputum, ↑ WBC, ↓ SaO2

<p><b>CAP</b> Community-Acquired</p> <p><b>CURB-65:</b> Confusion, BUN &gt;19, RR&gt;29, SBP &lt;90, 65yo or greater</p> <p><b>0-1</b> → Treat as outpatient <b>Azithromycin</b> (Z-pak) If comorbidities, consider adding a beta-lactam or using a resp FQ</p> <p><b>1-2</b> → Consider Admit to Wards <b>Ceftriaxone</b> 1g IV q 24h <b>AND</b> <b>Azithromycin</b> 500mg IV/PO q24h</p> <p><b>3-5</b> → Consider ICU Admission <b>Azithromycin</b> 500mg IV q24h <b>AND</b> <b>Cefepime</b> 2g IV q8h +/- <b>Vancomycin</b> 15mg/kg IV q8-12h if concerned for MRSA</p> <p>Typical Duration of Tx: 5 days</p>	<p><b>HAP</b> Hospital-Acquired; hospitalized &gt;48 hrs</p> <p><b>VAP</b> Ventilator-Associated; intubated &gt;48 hrs</p> <p>Obtain Blood and Sputum Cultures Consider a serum Procalcitonin Consider an RVP +/- Influenza</p> <p><b>Cefepime</b> 2g IV q8h <b>AND</b> <b>Vancomycin</b> 15 mg/kg IV q8-12h (Consider 25-30mg/kg load i.v.) +/- <b>Tobramycin</b> 7mg/kg IV q 24h if severely ill and significant concern for Pseudomonas</p> <p><b>TIMEOUT</b> Consider de-escalation 48-72 hrs</p> <ul style="list-style-type: none"> <li>• Clinical response, cultures, repeat procalcitonin</li> </ul> <p>Typical duration of Tx: 7 days</p>
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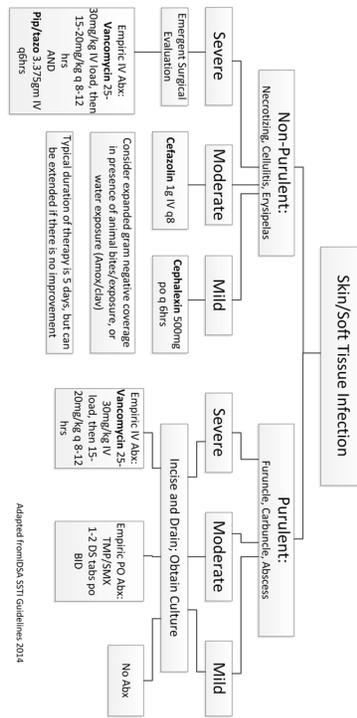
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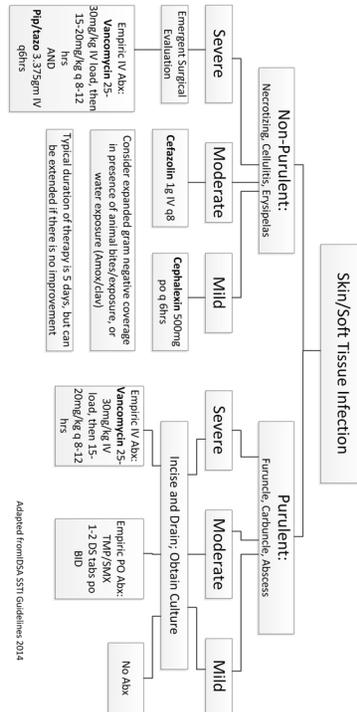
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Adapted from IDSA SSTI guidelines 2014

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**SAMMC Antimicrobial Stewardship Program**

Department	Phone Number
Infectious Disease	513-6060, 916-5554 (clinic)
Pediatric ID	513-9544
Infection Control (page ID after hrs)	916-3857, -1430, -8294, -6842
Microbiology	916-3353
Pharmacy (Inpatient)	916-6975, 916-5251

**SELECTED SUSCEPTIBILITIES OF LOCAL ISOLATES:**

- *Staphylococcus aureus*
  - Resistance: TMP/SMX, 2%; Doxycycline, 6%; Clindamycin, 31%
  - 40% MRSA; if serious infection, Choose Vancomycin!
- *Enterococcus* spp.
  - 8% resistant to Ampicillin; 7% are VRE
- *E. coli*
  - 19% is resistant to FQ; 23% is resistant to TMP/SMX
- *Pseudomonas*
  - Resistance to individual agents Pip/tazo, Cipro, or Imipenem ranges from 18-20% each; 12% resistant to Cefepime, 8% resistant to Tobramycin
  - Adding a fluoroquinolone to a beta-lactam for empiric “double coverage” only adds an additional 2-6% of isolates. In order to get >90% susceptibility, an aminoglycoside should be added to a beta-lactam, only indicated in severely ill.

**GENERAL PRINCIPLES OF ANTIMICROBIAL STEWARDSHIP:**

1. Get **Cultures prior** to initiating antimicrobials
2. **Select** Empiric Antibiotics based on **Local Susceptibility Data**
3. Take an **Antibiotic Time-out** at 48-72 hours to assess drug/spectrum
4. Choose the **Right Drug, Right Dose, Right Duration** of the most narrow spectrum

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## GOALS FOR 2016-2017 SAMMC ASP GUIDELINES

- Limit fluoroquinolone (FQ) use
  - FDA states that serious side effects of FQ generally outweigh benefits for pts with acute sinusitis, bronchitis, or uncomplicated UTI if other treatment options are available
- Minimize clindamycin use
  - It is active against <70% of our *S. aureus* isolates
  - It increases risk for *C. difficile* Infection (Odds Ratio 16.8)

### RISK FACTORS FOR INFECTION WITH AN MDRO:

- Prior colonization with MDRO
- Recent (within 90days) intravenous antibiotics
- Recent prolonged (>5 days) hospitalization
- Residence in long term care facility

### ISOLATION PRECAUTIONS

**Wash hands** or use hand sanitizer before and after all contact with patients/environment.

**Standard:** Wear gloves (gown) when anticipate exposure to blood/body fluids. Wear eye/face protection when exposures to aerosols or spraying are likely.

Type	Pathogen/disease	Gloves/Gown	Surgical Mask	N95 Mask
<b>Contact</b>	Diarrhea, draining wounds, generalized rash, MDRO, RSV	X		
<b>Contact Plus</b>	<i>Clostridium difficile</i> -from time of suspicion until 48hrs after formed stool	X Wash with SOAP/H <sub>2</sub> O		
<b>Droplet</b>	Respiratory viruses (RSV immunocompromised adults); pertussis, meningococcal, Group A strep		X	
<b>Airborne</b>	Measles, MERS CoV, Varicella, disseminated Zoster; TB		Patient during transport	X Neg Flow

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## Restricted Formulary

Antimicrobial	Indications (not all inclusive)/Degree of Restriction
Liposomal amphotericin b (Ambisome) (IV)	<b>Immediate ID Approval</b> Indications: 1. Invasive aspergillosis refractory to voriconazole 2. cryptococcal meningitis 3. other known or suspected systemic fungal infections  Please note, suspected mucorales infections should be dosed at 5-7.5mg/kg/day
Caspofungin (IV) and Micafungin (IV)	<b>Immediate ID Approval</b> Indications: Candidemia in the ICU, or other candida infections with resistant isolates (such as krusei)
Voriconazole (IV and PO)	<b>Immediate ID Approval</b> Indications: invasive aspergillosis or other mold infection.
Daptomycin (IV) Ceftaroline (IV) Linezolid (IV and PO)	<b>Immediate ID Approval</b> Indications: Alternative MRSA coverage. Culture directed therapy for vancomycin resistant enterococci (VRE). Do not use daptomycin for pneumonia.
Colistin (IV)	<b>Immediate ID Approval</b> One of the last line drugs for drug resistant gram negative rods, high toxicity profile
Amikacin (IV) Tobramycin (IV)	<b>72 hour ID Approval</b> – if continuing antimicrobial beyond 72 hours, please call for approval for continued use. Aztreonam indications: penicillin allergy pts requiring empiric gram negative coverage. NO gram positive or anaerobic coverage Aztreonam (IV) Fluconazole (IV only) Impipenem (IV) Meropenem (IV) Ertapenem (IV)
Aztreonam (IV) Fluconazole (IV only) Impipenem (IV) Meropenem (IV) Ertapenem (IV)	Impipenem/Meropenem: MDR gram negative infections Ertapenem: Intraabdominal infections, culture directed therapy against ESBL or MDR gram negative rods; Does NOT cover <i>Pseudomonas</i> or <i>Enterococcus</i>
Other Non-Formulary* Posaconazole Isavuconazonium Ceftaz/avibactam (Avycaz) Ceftolozane/tazobactam (Zerbaxa)	<b>Immediate ID Approval</b> Indications: Posaconazole – prophylaxis for invasive yeast and mold infections. Isavuconazonium – treatment for invasive yeast and mold infections Avycaz – Culture directed therapy of MDR pathogens. Better drug for KPC's (carbapenem resistant organisms) Zerbaxa – culture directed therapy for MDR pathogens (mostly <i>Pseudomonas</i> ).

**\*\*There are some exceptions to the above restrictions in Bone Marrow Transplant Unit, and the NICU**

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Other Non-Formulary* Posaconazole Isavuconazonium Ceftaz/avibactam (Avycaz) Ceftolozane/tazobactam (Zerbaxa)	<b>Immediate ID Approval</b> Indications: Posaconazole – prophylaxis for invasive yeast and mold infections. Isavuconazonium – treatment for invasive yeast and mold infections Avycaz – Culture directed therapy of MDR pathogens. Better drug for KPC's (carbapenem resistant organisms) Zerbaxa – culture directed therapy for MDR pathogens (mostly <i>Pseudomonas</i> ).

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## SEPSIS Recommendations

- Diagnostic work up: History/Physical, imaging as indicated
  - Blood cultures x 3 sets within first 24 hrs
  - UA/Culture if urinary symptoms
  - Sputum Culture if respiratory symptoms
  - Consider Serum Procalcitonin
- Start Empiric Antibiotics
  - Vancomycin 25-30mg/kg IV x1 load, followed by 15-20mg/kg IV q 8-12hrs, goal trough 15-20
  - Pip/tazo 4.5gm IV q 6 hrs
    - Pip/tazo covers 82% of *Pseudomonas*, up to 88% with FQ
    - Cefepime covers 88% of *Pseudomonas*, up to 90% with FQ; if choose cefepime, consider adding metronidazole to cover anaerobes (GI source)
  - Consider addition of Tobramycin 7 mg/kg q 24 x48-72 hrs for severely ill patients in whom there is risk for resistant *Pseudomonas*
- TIME-OUT:** Re-evaluate need for continued antibiotics/de-escalation at 48-72hrs
  - Consider culture results, clinical response, repeat Procalcitonin

### UTI Recommendations

- Do Not treat Asymptomatic Bacteriuria
  - unless pregnant, or preparing for invasive GU procedure
- Woman, acute, uncomplicated (no fever or flank pain and able to take PO)
  - Nitrofurantoin 100mg po bid x5d (96% of *E. coli* susceptible)
    - Do not use if CrCl <60
- Pyelonephritis
  - Get UA/Culture
  - If treating as an outpatient, start Levofloxacin 500mg PO daily empirically while awaiting susceptibilities (duration of therapy typically 5days)
  - If treating as an inpatient, start Ceftriaxone 1gm IV q 24h empirically while awaiting susceptibilities
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