NEUTROPENIC FEVER

*Diagnosis: If possible, obtain blood culture x 2 (1 peripheral and 1 central) before antibiotics are infused. **Do NOT** delay antibiotics while waiting for cultures to be drawn. Review past microbiology for known colonization or infections with resistant organisms.*

Typical Duration: until pt is afebrile and has ANC > 500

A. Stable with NO sepsis, NO history of resistant organisms, NO specific abdominal findings: (susceptible gram-negative rods including *Pseudomonas, Acinetobacter, E.coli, Klebsiella, etc)*

- Ceftazidime or Cefepime 2gm IV q8 hours
- Consider Vancomycin **IF** suspected line infection, mucositis, sepsis, h/o colonization or infection with MRSA

B. Stable with h/o MDR infection or colonization, or abdominal findings: (susceptible gram-negative rods including *Pseudomonas, Acinetobacter, E.coli, Klebsiella*, and anaerobes)

- Meropenem 1g IV q8 hours *(requires ID consult > 72hrs)*
- **ADD** Vancomycin **IF** suspected line infection, mucositis, sepsis, h/o colonization or infection with MRSA
- Consider Daptomycin 8mg/kg q24h instead of Vancomycin **IF** history of VRE colonization or infection but discontinue when culture negative for VRE.

C. Sepsis without focal findings: (susceptible gram-negative rods including *Pseudomonas, Acinetobacter, E.coli, Klebsiella*, and anaerobes)

- Meropenem 1gm IV q8 hours STAT **PLUS**
- Tobramycin 5 mg/kg IV x1 STAT, based on ideal body weight, unless underweight or obese or renal dysfunction (call pharmacy) **PLUS**
- Vancomycin loading dose IV x1 (2 gm if $\geq$70 kg, 1.5 gm if <70kg) STAT, then 15 mg/kg IV q12 hours

D. For all pts: During flu seasons, send Flu testing and then give oseltamivir 75mg - 150mg PO/NGT q12.

C.DIFFICILE DIARRHEA

Diagnosis: Only loose stools will be accepted by the lab for C.diff testing. Order C.diff testing (Toxigenic by PCR, not toxin assay) in CPOE.

Mild to Moderate disease: Metronidazole 500mg PO TID *Typical duration: 10-14 days, do not send stool for test of cure*

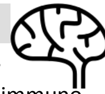
Severe disease (WBC > 15K, SCr 1.5 X baseline or ICU status): Vancomycin Solution 125mg PO q 6 hours **(Preferred agent for ICU)** *Typical Duration: 14 days; **DO NOT** send stool for test of cure*

Severe Complicated (hypotension or shock, ileus, mega colon): Vancomycin 500mg PO/NG q 6 hours **PLUS** Metronidazole 500mg IV q8 hours. Consider adding rectal instillation of vancomycin (500mg PR q6h) if complete ileus.

Also consider consulting GI, ID, and Surgery.

Duration variable

MENINGITIS



(*S.pneumoniae, N.meningitidis and H.influenzae*
Consider Listeria and HSV in patients age > 50, immunocompromised or alcoholic.)

Diagnosis: Order antibiotics immediately; Do not wait for results of LP to initiate antimicrobials. LP for opening pressure, gram stain, culture, HSV PCR, cell count, glucose, and protein. Add cryptococcal antigen for HIV patients.

Non-surgical, community-acquired:

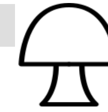
- Consider Dexamethasone 0.15mg/kg IV q6 hours for 2-4 days, give 15 minutes prior to abx if possible
- Ceftriaxone 2g IV q 12 hours **PLUS**
- Vancomycin loading dose IV x1 (2 gm if $\geq$70 kg, 1.5 gm if <70kg) STAT, then 15 mg/kg IV **q8 hours**
- **ADD** Ampicillin 2g IV q4 hours for Listeria coverage
- **ADD** Acyclovir 10mg/kg IV q8h for HSV coverage when appropriate

Typical duration: 14 days

Post-surgical meningitis: *(S.epidermidis, S.aureus, P.acnes,* gram-negative rods *(including P.aeruginosa)*

- Cefepime 2g IV q8 hours **PLUS**
- Metronidazole 500mg IV q8 hours **PLUS**
- Vancomycin loading dose IV x1 (2 gm if $\geq$70 kg, 1.5 gm if <70kg) STAT, then 15 mg/kg IV **q8 hours**

SUSPECTED FUNGEMIA



Risk factors: *Septic pts on TPN, prolonged abx therapy, malignancy, femoral catheterization or Candida colonization at multiple sites.*

- Micafungin 100 mg IV q24 hours
- De-Escalate to Fluconazole 400 mg-800mg IV Daily if *C.albicans* or if susceptible by MIC testing.
- Consult Infectious Diseases for line management.

Typical Duration: 14 days after blood culture clearance

SEPSIS: SITE UNKNOWN

(MRSA, resistant Gram-negative bacilli)
Diagnosis: Culture blood (all lumens), urine & sputum. Tailor antimicrobial within 48 hours

- Vancomycin loading dose IV x1 (2 gm if $\geq$70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hours **PLUS**
- Meropenem 1gm IV q8 hours *(requires ID consult > 72hrs)*
- If previous colonization or concerns for highly resistant Gram-negative pathogen such as *Acinetobacter, Pseudomonas*, or ESBL, **CONSIDER ADDING:**
  Ciprofloxacin 400 mg IV q8 hours **OR**
  Tobramycin 7mg/kg IV x1

Typical Duration: 14 days

SIGNIFICANT PENICILLIN ALLERGY

- Example - anaphylaxis, airway compromise, etc
- CONSULT ALLERGY for evaluation and possible skin testing

For all infections except hospital-acquired intra-abdominal infection:

- Replace Meropenem, Ceftazidime, Cefepime, or Piperacillin-Tazobactam with Ciprofloxacin 400mg IV q8h +/- Aztreonam 2gm IV q 8 hours

For intra-abdominal infections:

- Replace Ceftriaxone or Piperacillin-Tazobactam or Ertapenem with Levofloxacin 750mg PO/IV q24h + Metronidazole 500mg PO/IV q8h.

For CAP: Replace Ceftriaxone or Ampicillin-Sulbactam with Moxifloxacin 400mg PO/IV q24h

For NSTI: Omit Penicillin.

For meningitis: Replace Ceftriaxone or Ampicillin with Trimethoprim-Sulfamethoxazole 5mg/kg IV q8h **PLUS** Aztreonam 2g IV q8h **PLUS** Vancomycin

Empiric Antimicrobial Therapy

UW Medicine Sepsis Guidelines

Antimicrobial Stewardship Teams

These recommendations are based on local microbiology, antimicrobial resistance patterns, and national guidelines. They should not replace clinical judgment, and may be modified depending on individual patient. Consult pharmacy for renal dosing.

Conversion from IV to PO may be appropriate once patient hemodynamically stable and/or tolerating medications by mouth.

Order the first dose of antibiotics as STAT.

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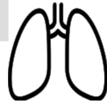
PNEUMONIA



A. Community-acquired pneumonia [non-aspiration risk] (*S. pneumoniae*, *atypicals*)
Diagnosis: Send sputum gram stain & culture, CXR, and blood cultures.

- Ceftriaxone 1 gm IV q24 hours **PLUS**
- Azithromycin 500 mg PO/IV q24 hours
- If previous MRSA colonization or infection, **CONSIDER ADDING:** Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hours

Typical Duration: 7 days

B. CAP with cavitary lesion(s) (*Oral anaerobes and MRSA*)

- Ampicillin/Sulbactam 3 gm IV q6 hours **PLUS**
- Azithromycin 500 mg PO/IV q24 hours **PLUS**
- Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hours

Typical Duration: 10-21 days

CF or Lung transplant patients: Call Pulmonary Transplant and Transplant Infectious Diseases Consult.

C. High-risk for MDRO pneumonia [i.e.from skilled nursing facility, etc](MRSA, resistant Gram-negative rods including *Acinetobacter*, *Pseudomonas*, ESBL)

- Cefepime 2g IV q8 hours +/- Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hours if h/o MRSA infection/colonization

Typical Duration: 7 days

D. UWMC only: Ventilator-associated Pneumonia (VAP) regardless of hospitalization day

- Treat as **High-risk for MDROs (see section C)**

E. HMC only:

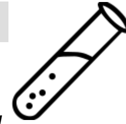
- **Early onset VAP (i.e. ≤ 4 days of hospitalization or ventilation) or aspiration:** Ceftriaxone 1g IV daily **OR** Ampicillin-sulbactam 3g IV q6h
- **Late-onset [> 4 days inpatient],** Treat as **High-risk for MDROs (see section C)**

F. For all Pneumonia pts:

⇒ **During flu seasons, send Flu testing and then give oseltamivir 75mg - 150mg PO/NGT q12.**

⇒ **Yeast in the sputum rarely represents true infection.**

BLOODSTREAM



A. Suspected Line infection (MRSA, Gram-negative rods)
*Diagnosis: Order antibiotics immediately and draw paired, simultaneous, **quantitative** blood cultures from all central line lumens AND one peripheral site. Central line CFU x2 more than peripheral site CFU strongly suggests line infection.*

- Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hours **PLUS**
- Cefepime 2gm IV q8 hours
- Please consult Infectious Diseases if considering line salvage

B. Suspected endocarditis, hemodynamically stable, no valve insufficiency:
Diagnosis: Draw 3 sets of blood cultures prior to antibiotics and consult Infectious Diseases.

- Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hours **PLUS**
- Ceftriaxone 2gm IV q24 hours
- Consult Infectious Diseases

CELLULITIS

Not-applicable to device-related infections (eg ICD, pacemakers,VADs, etc): Consult Infectious Diseases

A. Non-purulent skin/soft tissue infection:
(Streptococcus species)

- Cefazolin 2g IV q8h
- PO option for Strep/MSSA: Cephalexin 500mg QID

B. Purulent/abscess forming skin/soft tissue infection: (*S.aureus:* MSSA or MRSA)
Diagnosis: I&D abscess; send pus (not wound swab) for gram stain and culture.

- Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hrs
- De-escalate when culture data available
- PO options for MRSA: Bactrim or Doxycycline

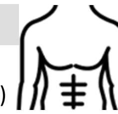
Typical Duration: 5-7 days; Consult Infectious Diseases for PO step-down options

NECROTIZING SOFT TISSUE INFECTION

(MRSA, Group A strep, *Clostridium sp* and mixed anaerobes, Gram-negative rods)
Typical Duration: 14 days after debridement
Diagnosis: Suspect NSTI in septic patients, rapid skin lesion progression, pain out of proportion to physical findings & hyponatremia. STAT surgery and Infectious Diseases consult. Focus therapy based on culture results and patient response.

- Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hours **PLUS**
- Penicillin 4 million units IV q4 hours **PLUS**
- Clindamycin 1200 mg IV q6 hours **PLUS EITHER**
- Levofloxacin 750mg IV daily **OR**
- **For Neutropenic pts:** Gentamicin 7 mg /kg IV q24 hours (replace Levofloxacin)
- **For Fournier's:** replace Penicillin with Piperacillin-tazobactam: 4.5g x1, then 3.375g IV q8h infused over 4 hrs

INTRA-ABDOMINAL



A. **Community-acquired, mild-moderate** (Enteric Gram-negative rods, anaerobes)

- HMC: Ertapenem 1g IV q24h
- UWMC: Ceftriaxone 2g IV q24 hours **PLUS** Metronidazole 500mg PO/IV q 8 hours
- For uncomplicated ***biliary*** infections, anaerobic coverage usually not necessary, use Ceftriaxone alone.

Typical Duration: 4 days following source control

B. Hospital-acquired, severe physiological disturbance, advanced age, immunocompromised (Resistant Gram-negative rods, anaerobes)

- Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hrs **PLUS EITHER**
- Piperacillin-tazobactam 4.5gm X 1, then 4 hours later start 3.375g IV q8h infused over 4 hours **OR**
- If previous colonization or concerns for highly resistant Gram-negative pathogen such as *Acinetobacter, Pseudomonas*, or ESBL, **consider:** Meropenem 1 gm IV q8 hours *(requires ID consult > 72hrs)* instead of Piperacillin-tazobactam

Typical Duration: 4-7 days from source control; if source control is not attained, then duration is variable.

C. Abdominal Transplant patients: Same as above and consult Transplant Infectious Diseases

URINARY

A. Community Acquired Pyelonephritis
(Enteric Gram-negative rods)
Diagnosis: Clean catch midstream U/A with reflexive gram stain and culture (UACRC). Neutropenic and transplant patients may not mount WBC response; appropriate to cover these patients empirically even without positive U/A if presentation suggests pyelonephritis.

- Ceftriaxone 1 gm IV q 24 hours
- If patient hemodynamically unstable or history MDRO, **CHANGE TO:** Ertapenem 1g q 24 hours

Typical Duration: 14 days

B. Catheter-associated UTI or Hospital- acquired:
(Resistant Gram-negative rods)
Diagnosis: Obtain specimen from new foley, or from sterilized port on existing foley, not from collection bag or urimeter. Send U/A with reflexive gram stain and culture (UACRC). WBCs and Bacteria on direct stain suggests infection, but colonization also very common.

- Ceftazidime 2g IV q8 hours
- If previous colonization with highly resistant Gram-negative pathogen such as *Acinetobacter, Pseudomonas*, or ESBL, **consider:** Meropenem 1 gm IV q8 hours *(requires ID consult > 72hrs)* instead of ceftazidime
- If GPC seen on gram stain, add: Vancomycin loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q12 hrs
- De-escalate or discontinue coverage if alternate source found for patient symptoms.

Typical Duration: 7-14 days

C. UTIs in abdominal Transplant patients: Same as above and consult Transplant Infectious Diseases