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 2gm IV q8h or Cefepime 2gm IV q8h
- 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 q8h *(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 q8h 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 **

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.
DO NOT *send stool for test of cure*

Mild to Moderate disease:
Metronidazole 500mg PO q8h, *duration: 10-14 days*

Severe disease (WBC > 15K, SCr 1.5 X baseline or ICU status): Vancomycin Solution 125mg PO q6h **(Preferred agent for ICU)** *Typical Duration: 14 days*

Severe Complicated (hypotension or shock, ileus, mega colon): Vancomycin 500mg PO/NG q6h **PLUS** Metronidazole 500mg IV q8h. Consider adding rectal 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 12h **PLUS**
- Vancomycin**
- **ADD** Ampicillin 2g IV q4 hours for Listeria coverage
- **ADD** Acyclovir 10mg/kg IV q8h for HSV coverage when appropriate

Typical duration: 7-21 days depending on organism

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

- Cefepime 2g IV q8h **PLUS**
- Metronidazole 500mg IV q8h **PLUS**
- Vancomycin**

Duration: variable

SUSPECTED FUNGEMIA

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

- Micafungin 100 mg IV q24h
- De-Escalate to Fluconazole 400 mg-800mg IV q24h 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** **PLUS**
- Meropenem 1gm IV q8h *(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 q8h **OR**
  Tobramycin 7mg/kg IV x1

Typical Duration: 7-14 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 q8h

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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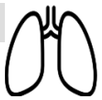
PNEUMONIA



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

- Ceftriaxone 1 gm IV q24h **PLUS**
- Azithromycin 500 mg PO/IV q24h x 5 days
- If previous MRSA colonization or infection, **CONSIDER ADDING:** Vancomycin**

Typical Duration: 7 days

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

- Ampicillin/Sulbactam 3 gm IV q6h **PLUS**
- Azithromycin 500 mg PO/IV q24h **PLUS**
- Vancomycin**

Typical Duration: 10-21 days

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

C. Healthcare associated pneumonia [i.e. from skilled nursing facility, etc]

- Cefepime 2g IV q8h +/- Vancomycin** if h/o MRSA infection/colonization

Typical Duration: 7 days

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

- Treat as **Healthcare associated pneumonia (section C)**

E. HMC only:

- **Early onset VAP (i.e. ≤ 4 days of hospitalization or ventilation) or aspiration:** Ceftriaxone 1g IV q24h **OR** Ampicillin-sulbactam 3g IV q6h

Typical Duration: 7 days

- **Late-onset [> 4 days inpatient],** treat as **Healthcare associated pneumonia (section C)**

F. For all Pneumonia pts:

⇒ **Anaerobic coverage such as Piperacillin-tazobactam is NOT recommended for HAP or VAP.**

⇒ **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** **PLUS**
- Cefepime 2gm IV q8h
- 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** **PLUS**
- Ceftriaxone 2gm IV q24h
- 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.

- *Usually abx are unnecessary unless significant surrounding cellulitis or pt clinically unstable*
- Vancomycin**
- De-escalate when culture data available
- PO options for MRSA: Bactrim or Doxycycline (Consult ID)

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)
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** **PLUS**
- Penicillin 4 million units IV q4h **PLUS**
- Clindamycin 1200 mg IV q6h **PLUS EITHER**
- Levofloxacin 750mg IV q24h **OR**
- **For Neutropenic pts:** Gentamicin 7 mg /kg IV q24 hours (replace Levofloxacin)
- **For Fournier's:** replace Penicillin with Piperacillin-tazobactam: 4.5gm x1, then 4 hours later, start 3.375gm IV q8h infused over 4 hrs

Typical Duration: 10-14 days after debridement

INTRA-ABDOMINAL

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

- **HMC only:** Ertapenem 1g IV q24h
- **UWMC only:** Ceftriaxone 2g IV q24h **PLUS** Metronidazole 500mg PO/IV q8h
- 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

- Vancomycin** **PLUS**
- Piperacillin-tazobactam 4.5gm X 1, then 4 hours later, start 3.375gm IV q8h infused over 4 hours

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

C. Intra-abdominal infections:

⇒ **Double anaerobic coverage is not required (i.e. metronidazole + piperacillin/tazobactam)**

⇒ **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 q24h
- If patient hemodynamically unstable or history MDRO, **CHANGE TO:** Ertapenem 1g q24h

Typical Duration: 14 days

B. Catheter-associated UTI or Hospital- acquired:(Resistant Gram-negative rods)
Diagnosis: In symptomatic pts, 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 q8h
- If GPC seen on gram stain, add: Vancomycin**
- 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

CONCERN FOR MULTI-DRUG RESISTANT ORGANISMS (MDRO)

If previous infection or colonization with highly resistant Gram-negative pathogens such as *Acinetobacter, Pseudomonas*, or ESBL, instead of the listed agent, **consider:** Meropenem 1 gm IV q8h, or 2 gm IV q8h for meningitis
(ID consult required for use beyond 72 hours)

****Vancomycin Dosing:**
Loading dose IV x1 (2 gm if ≥70 kg, 1.5 gm if <70kg), then 15 mg/kg IV q8-12 hours