Infectious Diseases Guide: Specific Conditions

James Taylor, MD and Matt Anderson, MD

Community Acquired Pneumonia

Clinical Presentation: Cough, dyspnea, febrile temperature, hypoxemia, fever

Diagnostic Evaluation: CT (at presentation or 24-48 hours following hydration) or CT scan

Organisms: - Typical: Streptococcus pneumoniae, Hemophilus influenzae - Atypical: Legionella, Chlamydia pneumoniae, Mycoplasma

Treatment: Empic antibiotic coverage aimed at most common pathogens (treat for total of 7-14 days).
- Outpatient: levofloxacin, azithromycin or doxycycline
- Inpatient: ceftriaxone/azithromycin or levofloxacin

Key Points:
- May alter therapy based on identification of infecting organism or other unique risk factors.
- Always tailor antibiotic to culture result.

Nosocomial Pneumonia (hospital acquired [HAP] and ventilator associated [VAP])

Clinical Presentation: 48 hours after admission or 48 hours after intubation

Diagnostic Evaluation: CXR (less specific in VAP), fever, leukocytosis, sputum/mucus production

Organisms: NRSJA, Pseudomonas, Klebsiella, E. coli

Treatment: Varies depending on recent abs and risk for drug resistant organisms. Typically ceftriaxone/levo/cef++/or levofloxacin

Key Points:
- Always tailor antibiotic to culture result.

Differential Risk Factors
- Age >65
- Diabetes Mellitus
- Neurologic (stroke, encephalitis, anoxic encephalopathy, meningitis)
- Pulmonary/heart failure
- Renal failure

Organisms: E. coli, Proteus, Staphylococcus aureus

Treatment: 3 days

Consider drug resistant on Pseudomonas and Enterococcus

* Do not typically treat Candida UTI except in poorly controlled diabetes, renal transplant recipients

Key Point: Always tailor antibiotic to culture result.

Urinary Tract Infection

Clinical Presentation: Urinary frequency, urgency, dysuria, fever, asymptomatic

Diagnostic Evaluation:
- U/LA: Positive ≥100,000, <100,000 with pyuria; leukocyte esterase and osmocyturia; Nitrite is + with enterobacteriaceae.
- Culture: >10^6 colonies/ml if patients have symptoms and >10^4 colonies/ml if asymptomatic and complicated infection is not suspected.

Uncomplicated

- Female without recent mucous membranes

Complicated

- Male
- Diabetes Mellitus
- Neurologic (stroke, encephalitis, anoxic encephalopathy, meningitis)
- Pulmonary/heart failure
- Renal failure
- Culture +/culture membrane

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Surgical Abscess

Clinical Manifestations: Back pain (midline or radicular) + fever + progressive weakness

Etiology:
- Hemorrhagic (2/3): skin/soft tissue infections endocarditis
- Direct extension (1/3): vertebral osteomyelitis, sacral decubitus ulcer, spinal abscess, thoracic, lumbar backache

Staphylococcus aureus most common pathogen

Risk Factors: Diabetes, renal failure, alcoholism, HIV, immunosuppression

Cellulitis

Clinical Presentation: Diffuse areas of skin demarcation (typically bilateral), not as warm, more well-defined borders, deeper pink/purple color

- Drain a line around borders of the erythema to provide more accurate assessment of the infection.
- Palpate for tenderness to rule out thrombophlebitis. Don’t forget about DVT.
- Erythema doesn’t resolve with elevation of the affected limb (which is erythema due to venous insufficiency).

Organisms: Usually gram positives (strep and staph), think about anaerobes/polymicrobial in diabetic foot and treatment is usually empiric.

Treatment: Duration 7-14 days but follow clinically. Look out for subcutaneous fluid collections/abscesses which, if not drained, will not allow resolution of the infection.

Key Points:
- Always tailor antibiotic to culture result.

Osteomyelitis (cont)

Diagnosis:
- Probing ulcer to bone: Sensitivity 67% and specificity 91%. PPV of 0.57 with prevalence in population of 12%. NPV was 0.98. Lavery, L.A et al. Diabetes Care, 2007 Feb, 30(2): 270-4
- ESR: See critical edition, perimeter reaction, soft tissue swelling (these changes lag behind clinical situation so not sensitive in acute setting)
- MRI: Very sensitive (>90%) and specificity is reported as >82% in recent meta analysis. (Capraro, A et al. Archives of Internal Medicine, 2007 Jan 22; 167(2): 125-32)
- Bone scan: Relative sensitivity (usually ~80%) but not specific (as low as 25% - Lavery et al. 2007) NPV was 0.98.

Organisms:
- Hemorrhagic: Sensed from bacteremia, commonly Staphylococcus aureus
- Direct extension: Vertebral osteomyelitis, sacral decubitus ulcer, spinal abscess, thoracic, lumbar backache

Staphylococcus aureus most common pathogen

Risk Factors: Diabetes, renal failure, alcoholism, HIV, immunosuppression

Clinical Presentation: Draining ulceration or fistula, localized pain which leads to radiographic investigations, +/- signs of systemic infection

Etiology:
- Usually gram positives (staph and strep); think about anaerobes/polymicrobial
- 1st generation cephalosporins (i.e. cephalexin), anti-staphylococcal penicillins (i.e. dicloxacillin), 2nd line agents being clindamycin, azithromycin, quinolones

Duration 7-14 days but follow clinically. Look out for subcutaneous fluid collections/abscesses which, if not drained, will not allow resolution of the infection.

Clinical Presentation: Diffuse areas of skin demarcation (typically bilateral), not as warm, more well-defined borders, deeper pink/purple color

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**Clostridium difficile COLITIS**

**Clinical Presentation:**
- Can occur after any antibiotic treatment regimen
- Manifests as loose stools, sometimes voluminous in nature
- +/- fever, also can be only symptom
- Clinically dramatic elevation of WBC count (often >30,000) with significant bandemia

**Diagnosis:**
- Test with stool toxin ELISA x 3 stools collected on 3 successive days (sensitivity of 70-90% and specificity 99%)
- Metronidazole po x 14 days. Second line therapy is with po Vancomycin x 14 days

**Clinical Presentation:**
- History: meningismus (neck stiffness), photo/ophthalmitis, mental status changes, fever, encephalitis/rick contacts
- Faney, Kernig’s, Brudzinski’s signs, neck range of motion, full neurologic and mental status evaluation

**Organisms:**
- *Staphylococcus aureus* (less common)
- *Haemophilus influenzae*
- *Streptococcus pneumoniae*
- *Clostridium difficile* (tick-borne)
- *Klebsiella pneumoniae*
- *Enterobacter cloacae* (less common)
- *Escherichia coli* (tick-borne)
- *Streptococcus pyogenes*
- *Actinobacillus actinomycetemcomitans, Cardiobacterium hominis, Eikenella spp, and Kingella kingae."

**MENINGITIS**

**Diagnosis:**
- Lumbar Fontaine

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**Key Point:** Get gram stain and culture on all specimens. Get cell counts with differentials on tubes 1 and 4 to see if there may be changes related to trauma of the tap.

**Treatment:**
- EARLY ANTIBIOTICS (after tap because need to identify organism)
  - Ceftriaxone (2g IV q12h) +/- vancomycin
  - Staphylococcal empyema/empyema
  - Duration of 14 days

**Criterias for Endocarditis (re-created from Modified Duke’s Criteria):**
- Requires 2 major OR 1 major + 3 minor OR 5 minor criteria

**MAJOR CRITERIA:**
1. Positive blood cultures with typical organism for endocarditis
2. Single cause, small valve, standard blood culture, VAN group (thrombosis spp, Actinobacillus actinomycetemcomitans, Cardiobacterium hominis, Eikenella spp, and Kingella kingae.)
3. Persistent positive blood cultures from cultures drawn more than 12 hours apart OR at least 3/4 separate blood cultures with the first and last drawn at least one hour apart

**MAJOR CRITERIA (cont):**
- Evidence of endocardial involvement
  - Positive echocardiogram (i.e. oscillating intracardiac mass on valve or supporting structures, or in the path of regurgitant jets, or on an implanted material, in the absence of an alternative anatomic explanation)
  - Rheumatoid factor
  - Malignant effusion: evidence of active infection with organism consistent with endocarditis

**Treatment:**
- Be sure to remove all control lines that are in place at the time of positive blood cultures unless they are absolutely necessary
- – Target infecting organism
- – Always document bloodstream clearance with repeat cultures that are negative
- – If cultures are persistently positive, need to treat an endocarditis for 4-6 wks
- – For bacteria without evidence of endocarditis, if cultures close in 1-2 days treat as a simple bloodstream infection for 2 weeks

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