Prosthetic Joint Infections and Osteomyelitis (Excluding Diabetic Foot Infection)

Work-up:

1. Blood cultures prior to antibiotics
2. Joint fluid aspirate, send for culture as well as cell count/differential
3. MRI is the most sensitive and specific imaging modality for osteomyelitis.
4. Send bone biopsy or specimen for culture if it can be obtained, ideally prior to antibiotics.

Treatment: Based on microbiology

Microbiology	First Line	Second Line	Comments
Empiric or culture negative	Vancomycin + ciprofloxacin 750mg BID	Daptomycin 8mg/kg IV Q24h as substitute for vancomycin, ceftriaxone 2g IV q24h as substitute for ciprofloxacin	Daptomycin: check baseline CK, and consider holding statins Quinolones: Consider EKG if on other QTc prolonging agents
Methicillin-Susceptible *Staphylococcus* spp.	Nafcillin 2g IV q4 hr (12gm/24hr) OR cefazolin 2g IV q8h (6gm/24hr) OR Ceftriaxone 2g IV q24h (plus rifampin 300-450mg BID if liner exchange, 1 stage revision, or retained hardware)	Vancomycin (plus rifampin 300-450mg BID if liner exchange, 1 stage revision, or retained hardware)	Avoid combination of nafcillin plus rifampin if on Coumadin
Methicillin-Resistant *Staphylococcus* spp, Vancomycin MIC <2	Vancomycin (plus rifampin 300-450mg BID if liner exchange, 1 stage revision, or retained hardware)	Daptomycin 8mg/kg IV q24h OR Linezolid 600mg PO BID (plus rifampin 300-450mg BID if liner exchange, 1 stage revision, or retained hardware)	Daptomycin: check baseline CK, and consider holding statins Linezolid: Avoid using with SSRIs or other agent that increase serum levels of serotonin
Methicillin-Resistant *Staphylococcus* spp, Vancomycin MIC ≥2	Daptomycin 8mg/kg IV q24h OR Linezolid 600mg PO BID (plus rifampin 300-450mg BID if liner exchange, 1 stage revision, or retained hardware)	Ceftaroline	Request ID consultation
Pseudomonas	Cefepime 2g IV q12h (6g/q24h) OR Ceftazidime 2g IV q8hr (6g/24hr)	Ciprofloxacin 750mg PO BID OR Piperacillin-tazobactam (higher dose for Pseudomonas)	
Enterobacteraciae	IV PCNs or cephalosporins based on in vitro sensitivities OR Ciprofloxacin 750mg PO BID	Ertapenem 1g IV q24h	Consider reserving oral quinolone for suppression if liner exchange or 1-stage revision and no other oral medications available
Streptococcus spp.	PCN G 4 million units q4h (24 million units IV q24h) OR Ceftriaxone 2g IV q24h	Vancomycin	
Enterococcus (ampicillin-sensitive)	Ampicillin 2g IV q4h (12 g/q24h) OR PCN G 4 million units q4h (24 million units IV q24h)	Vancomycin OR Daptomycin 8mg/kg q24h OR Linezolid 600mg PO BID	If using PCN G, need to confirm with lab isolate sensitive
Enterococcus (ampicillin-resistant, vancomycin-sensitive)	Vancomycin	Daptomycin 8mg/kg IV q24h OR Linezolid 600mg PO BID	

Enterococcus (VRE)	Daptomycin 8mg/kg IV q24h OR Linezolid 600mg PO BID	Tigecycline 100mg load then 50mg BID	Consider anti-emetic pre-med with tigecycline
Propionobacterium	PCN G 4 million units q4h (24 million units IV q24h) OR Ceftriaxone 2g IV q24h	Vancomycin	If using PCN, request lab perform beta-lactamase test. If suppression anticipated, please send for formal susceptibility testing.

Duration (dependent on procedure and organsm):

Resection arthroplasty:

- 4-6 week regardless of organism, then 3 months of oral therapy (ideally directed at initial organism)

Liner exchange:

- Staph spp: 2-6 weeks of rifampin plus IV companion drug, followed by 3 months (hip) or 6 months (knee) oral therapy (consider rifampin plus oral companion drug)
- All other organisms: 4-6 weeks followed by oral suppression (duration TBD by ID)

1-stage revision:

- Staph spp: 6 weeks of rifampin plus IV companion drug, followed by 3 months of oral therapy (consider rifampin plus oral companion drug)
- All other organisms: 4-6 weeks followed by oral suppression (duration TBD in clinic)

Osteomyelitis: 6 weeks regardless of organism. Consider early transition to oral regimen if there is an agent with excellent bioavailability to which the organism is sensitive (eg, quinolone, metronidazole or linezolid). Oral suppression to be determined at clinic f/u, but is generally only indicated for retained hardware.

References:

1. Osmon DR, Berbari EF, Berendt AR, et al; Infectious Diseases Society of America.. Executive summary:diagnosis and management of prosthetic joint infection: clinical practice guidelines by the Infectious Diseases Society of America. Clin Infect Dis. 2013 Jan;56(1):1-10.
2. Berbari EF, Kanj SS, Kowalski TJ, et al, Infectious Diseases Society of America. 2015 Infectious Diseases Society of America (IDSA) Clinical Practice Guidelines for the Diagnosis and Treatment of Native Vertebral Osteomyelitis in Adults. Clin Infect Dis. 2015 Sep 15;61(6):e26-46.