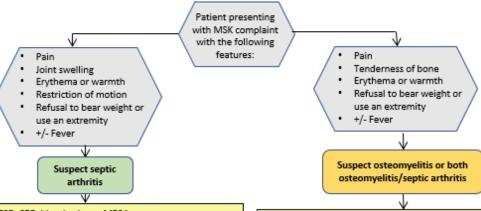


Guidelines for Management of Pediatric Patients with Suspected Musculoskeletal Infections



- Labs: CBC, ESR, CRP, blood culture, MRSA screen
- Obtain plain films +/- ultrasound of involved joint; consider MRI with contrast for concurrent osteomyelitis
- Consult orthopedics
- Consult infectious diseases
- If hemodynamically unstable, start vancomycin and cefazolin and speak to infectious diseases early
- If well hold antibiotics pending arthrocentesis/washout unless blood culture is positive
- If orthopedics performs an arthrocentesis send synovial tissue and aspirates (not swabs if possible):
- Cell count, gram stain, culture, pathology, +/- AFB and fungal cultures
- If < 4 year old, Kingella PCR and inoculate synovial fluid into blood culture bottles to increase vield
- Send extra specimen to send outs in case of additional testing
 - If joint fluid consistent with infection (eg: purulent or cloudy, >50,000 WBC, high% PMNs, positive gram stain)
 - If age ≥ 4 start empiric IV clindamycin
 - if age <4 years consider cefazolin (either alone or with clindamycin)
 - Consider Lyme serum titers if from endemic county. Can also send Lyme PCR from joint fluid.

- Labs: CBC, ESR, CRP, blood culture, MRSA screen
- Obtain plain films (image joint above and below)
- Consult orthopedics, consider MRI with contrast
- Consult infectious diseases
- If hemodynamically unstable, start vancomycin and cefazolin and speak to infectious diseases early
- If well, hold antibiotics pending possible biopsy or source culture unless blood culture is positive
- If I/D or biopsy performed send synovial tissue and aspirates (not swabs if possible) for:
- Pathology, bacterial gram stain and culture, +/- AFB and fungal cultures
- If < 4 year old, Kingella PCR and inoculate sample into blood culture bottles to increase yield
- Extra specimen to send outs in case of additional testing
- After I/D, If age ≥ 4 start empiric IV clindamycin
- If no I/D performed, please discuss with ID prior to starting antibiotics
- Daily physical exam and CRP every 1-2 days
- · If patient is not improving consider repeating imaging, labs, or cultures; or expanding differential dx (discuss with ortho and ID)

Criteria to transition to oral antibiotics and discharge

- Definitive and consistent clinical improvement (i.e. weight bearing or moving extremity)
- Tolerating oral antibiotics and pt/family understand importance of compliance
- Follow up blood cultures negative x 48 hours if patient was bacteremic
- CRP half of initial and consistently downtrending
- Known susceptibilities if cultures positive

- If age <4 years consider cefazolin (either alone or with
- clindamycin)

EXCLUSION criteria

- Age < 3 months (may need to consider LP, unusual organisms)
- Chronic infection, decubitus ulcer, or previous septic joint/osteomyelitis
- Concern for CRMO
- Polyarthritis
- Immunocompromisedhost
- Hardware infection
- Penetrating traumatic injuries
- Necrotizing infections

Risk factors for less common organisms

- <u>Lyme</u>: Exposure to Nevada, Mono, Amador, Tuolumne, Mendocino, Trinity, Humboldt, Sonoma, Marin,
 Santa Cruz counties
- Gonococcus: Adolescence, sexual activity
- Streptococcus pneumonia, Hemophilus influenzae: Unvaccinated and age <5
- Salmonella: Pets, sickle cell, asplenia
- <u>Tuberculosis</u>: Travel, contacts
- <u>Brucella</u>: Dairy, farm animals
- <u>Endemic fungi</u>: Travel, Central Valley (Coccidioides) includes Kern, Fresno, Kings, Monterey, Merced, San Louis Obispo, Tulare counties

How to send special labs:

- Kingella PCR from synovium or bone: miscellaneous send out to Mayo (MAYO # KKRP)
- Lyme PCR: (orderable in EPIC)
- <u>University of Washington broad range PCR</u> (bacterial, fungal, AFB): Miscellaneous send out: Needs a separate fluid/bone sample to be sent directly to send out lab

Discharge and outpatient management

General length of therapy:

- Septic arthritis 2-4 weeks
- Osteomyelitis 3-6 weeks
- If indicated (rare), arrange for outpatient parenteral (IV) antimicrobial therapy (OPAT) with ID and discharge planner
- Ortho outpatient referral for follow-up in 1-2 weeks
- ID outpatient referral for follow-up in 2-3 weeks
- Weekly labs if receiving parenteral therapy to monitor side effects of antibiotics (see below)

Most commonly used antibiotics for MSK infections with typical dosing and side effects

	Cefazolin (IV)	Cephalexin (PO)	Ceftriaxone (IV)	Vancomycin (IV)	Clindamycin (IV or PO)	Ampicillin (IV)	Amoxicillin (PO)	TMP-SMX (IV or PO)	Linezolid (IV or PO)	Daptomycin (IV)	Ceftaroline (IV)
Daily amount	150 mg/kg/day divided Q8H	100-150 mg/kg/day divided TID or QID	100 mg/kg/day divided 0.12- 24h	Start at 15mg/kg/dose Q6H; goal trough 15-20	40mg/kg/day divided Q6H or Q8H	200 mg/kg/day divided Q6H	80-100 mg/kg/day divided TID	12mg/kg/day divided BID	<12 years: 30mg/kg/day divided Q8H <u>212 years:</u> 20mg/k/dayg divided Q12H	1-6 years: 12 mg/kg/daily 7-11years: 9 mg/kg daily 12-17 years: 7 mg/kg daily	45 mg/kg/day divided Q8H
Maximum dose	2000 mg	1000 mg	2000 mg	Adjust based on trough and renal function	IV: 900 mg PO: 600mg	2000 mg	1000 mg	160 mg	600mg	None	600mg
Side Effects											
Diarrhea including C. difficile colitis	+	+	+	+	‡	+	+	+	‡	+	+
Bone marrow suppression	+	+	+	+		+	+	+	‡		+
Rash, including Stevens-Johnson syndrome	+	+	+	+	+	‡	‡	‡	+	+	+
Nephrotoxicity	+	+		‡		+	+	+		+	+
Elevated transaminases			+					+	+	+	+
Elevated CK										+	
Optic neuropathy									+		
Serotonin syndrome									+		
Lactic acidosis									+		
Cholestasis			‡								

(Modified from Antimicrobial Stewardship at Children's Hospital Colorado, Sarah Parker 2023 and 2021 IDSA guidelines)

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