

# CLINICAL PATHWAY: Osteomyelitis

THIS PATHWAY  
SERVES AS A GUIDE  
AND DOES NOT  
REPLACE CLINICAL  
JUDGMENT.

**Inclusion Criteria:** Age >2 months with suspicion for acute osteoarticular infection (<4 weeks since symptom onset)  
**Exclusion Criteria:** Age ≤2 months, chronic osteomyelitis (≥4 weeks from symptom onset), suspected skull (including orbital) or vertebral osteomyelitis, infection surrounding open fracture or hardware, immunocompromised patients, concern for septic shock (see [Septic Shock Clinical Pathway](#))

## Initial Evaluation

- **History & physical exam:** consistent with acute osteoarticular infection<sup>1</sup>
- **Labs:** CBC with diff, CRP, ESR, CMP, blood culture
- **Initial imaging:** 2-view x-rays of affected area
- **Make NPO** for possible surgical procedure
- **Hold empiric antibiotic coverage** until imaging completed (if patient stable, may hold up to 48 hours), unless **concern for sepsis/hemodynamic instability** (should be treated per [Septic Shock Clinical Pathway](#)) or positive blood culture

## <sup>1</sup>High Suspicion for Osteomyelitis

- Fever
- Focal pain and/or decreased function/weight-bearing of affected area
- Localized edema, tenderness, erythema, and/or warmth on exam
- Superficial infection (i.e., cellulitis) not improving as expected
- ↑ CRP and/or ESR

High suspicion for osteomyelitis?

No

Treat off pathway.  
Consider alternative diagnosis (e.g., septic/reactive arthritis, Lyme arthritis, myositis, fracture, malignancy, etc).

Yes

## Consultations in the Emergency Department (ED):

- Orthopedics ASAP to guide imaging; Infectious Diseases (ID) if positive blood culture or imaging consistent w/osteoarticular infection
- Imaging:**
- MRI with and without gadolinium contrast of region of suspicion, per Orthopedics (may not be required for fingers/toes)
    - *If sedation is required for MRI:* coordinate with Orthopedics (who will discuss with Anesthesia) so that a potential surgical procedure can occur while the patient is still under sedation
  - *If high suspicion for septic joint:* consider joint ultrasound while awaiting MRI, per Orthopedics

Evidence of osteomyelitis on imaging (or high suspicion of osteo but unable to obtain imaging in the ED)?

No

Treat off pathway.  
Consider alternative diagnosis.  
Consider discharge with close PCP follow-up.

Yes

## Admit to Pediatric Hospital Medicine (PHM) service

*If sickle cell disease or other hemoglobinopathy present, admit to Heme/Onc*  
**Consult Infectious Diseases (ID)** once imaging confirms osteomyelitis, if not already done.

## Antibiotics

## Assessment

## Surgical Management

## Empiric Antibiotic Coverage

[Common pathogens: MSSA (most common), MRSA, *Strep pyogenes*, *Strep pneumoniae*, *Kingella* (≤4 yrs)]

## Antibiotic Timing:

- **Obtain blood culture before antibiotics**
- Discuss timing of antibiotics with ID:
  - Hold antibiotics until after surgery if surgery done ≤48hrs after admission
  - Give antibiotics immediately if surgery is not indicated, surgery is delayed >48hrs, concern for sepsis, or if blood culture is positive

## Antibiotic Selection:

- **No recent history of invasive MRSA infection (in past 6 months):**
  - Preferred: **Cefazolin IV** 150 mg/kg/day div q8hr (max 6 g/day)
  - Alternatives:
    - *If bone abscess:* Nafcillin IV 200 mg/kg/day div q6hr (max 8 g/day) and/or clindamycin IV 40mg/kg/day div q8hr (max 2.7g/day)
    - *If cefazolin allergy:* consider nafcillin, another cephalosporin, or clindamycin (consult ID and pharmacy)
- **If recent history of MRSA (invasive infection in past 6 months) or suspicion for *Salmonella*, *Kingella*, or other less common pathogens:** discuss with ID

## Ongoing Antibiotic Management

- <sup>2</sup>*If blood culture positive:* adjust antibiotics according to BioFire BCID PCR and/or blood culture sensitivities per ID guidance

## Labs:

- Repeat CBC w diff after 48 hours, then PRN
- Trend CRP q48hrs
- *If blood culture positive<sup>2</sup>:* repeat blood culture after 36-48 hours to document sterility

## Assess for risk of acute and chronic complications when repeat CRP is available at 48-96 hours after starting antibiotics

- Use A-SCORE and C-SCORE in [Appendix A](#)

Low risk for acute and chronic complications?

Yes

(A-SCORE ≤4 and C-SCORE ≤3?)

No

(A-SCORE >4 or C-SCORE >3)

## Discharge criteria for PO antibiotic course:

Afebrile >24 hrs; improving pain and function; CRP ≤50% of maximum value

## Outpatient Medications (consider trial of PO antibiotic before discharge for young children):

*Final antibiotic selection based on response to inpatient antibiotic, micro results and ID recs. Minimum duration 3-4 weeks (IV + PO).*

- Cephalexin 100-150 mg/kg/day div TID depending on severity of infection (max 1.5 g/dose: 4.5 g/day if div TID; for large adolescents up to 6 g/day div QID) or Clindamycin 40 mg/kg/day div TID (max 1.8 g/day)
- If no PICC in place: offer probiotics

## Disposition

- Follow up: ID within 7-10 days; orthopedics within 2-4 weeks
- If discharged on IV antibiotics, order weekly labs: CBC with diff, CMP, ESR, CRP (*if not yet normalized at discharge*)
  - Fax to ID Department at 860-545-9371 with name of ID attending
- Long term follow up at orthopedics for detection of possible sequelae, including ≥1 year if C-SCORE ≥4

## Not yet eligible for PO antibiotics

- Consider: repeat MRI; surgical drainage/culture; antibiotic changes per ID; PICC for prolonged antibiotics
- ID to determine ideal timing to change to PO antibiotics on case-by-case basis

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**Acute and Chronic Scores for Complications of Osteomyelitis Risk Evaluation**

<b>A-SCORE:</b> Acute Score for Complications of Osteomyelitis Risk Evaluation <i>(≤4 has negative predictive value of ≥91%)</i>	
Complication	A-SCORE Points
Bone abscess	2
Prolonged fever > 48 hours after starting antibiotics	2
Suppurative arthritis	3
Disseminated disease <sup>1</sup>	4
Delayed source control <sup>2</sup>	4
<b>Maximum score</b>	<b>15</b>
<b>A-SCORE interpretation</b>	≤4 = low risk for acute complications

<b>C-SCORE</b> Chronic Score for Complications of Osteomyelitis Risk Evaluation <i>(≤3 has negative predictive value of ≥95%)</i>	
Complication	C-SCORE Points
CRP ≥ 10mg/dL at 2-4 days after starting antibiotics	1
Disseminated disease <sup>1</sup>	1
Bone drainage/debridement	2
<b>Maximum score</b>	<b>4</b>
<b>C-SCORE interpretation</b>	≤3 = low risk for chronic complications

<sup>1</sup>**Disseminated disease:** multifocal infection, pneumonia, septic pulmonary embolism, deep vein thrombosis, or endocarditis

<sup>2</sup>**Delayed source control:** >72 hours after admission