



Inflammation of the cellular and extracellular matrix of bone due to **infection with a microbial pathogen**.

Acute osteomyelitis: diagnosis of bone infection within 4 weeks after the onset of clinical manifestations.

Chronic osteomyelitis: protracted, indolent disease process with sequestrum and/or relapse of infection more than 4 weeks after the initial diagnosis and treatment.

DIAGNOSIS

Gold Standard: microbiological & pathological assessment of bone sample (*only if need for debridement*)

- MRI with gadolinium enhancement
- X-ray may not be helpful as findings lag 7-10 days after symptom onset

COMMON BACTERIA

In children older than 1 month:

1. *Staphylococcus aureus* (up to 33% are MRSA)
2. *Streptococcus pyogenes*
3. *Streptococcus pneumoniae*
4. *Kingella kingae**

**higher rate of infection in younger children*

CLINICAL PRESENTATION

- Pain involving a bone or joint
- Lack of weight bearing & decreased use of affected extremity
- Fever
- Focal swelling, tenderness, warmth, erythema when metaphyseal and periosteal infection with abscess



Pain near the buttock or pelvic area?

- High degree of suspicion for osteomyelitis in the pelvic bone or ileum!
- Physical findings are very difficult to elicit.



Septic arthritis or bone/soft tissue abscess?
Needs debridement!

INITIAL WORK-UP

- CBC
- CRP
- Radiograph (*rule out trauma*)
- Blood Culture
- +/- ESR

PATHOPHYSIOLOGY

Commonly acquired through hematogenous (bacteremia), through direct inoculation (trauma or recent procedures), or via spread from adjacent soft tissue or synovial fluid infection.

With hematogenous osteomyelitis, organisms enter the bone through nutrient arteries and proliferate in venous sinusoids.

Children have a rich vascular supply in their bones especially around the growth plates.

Common sites: metaphysis in long tubular bones.

DIFFERENTIAL DIAGNOSIS

Transient synovitis of hip	Bone neoplastic lesion
Fracture/Trauma	Lyme disease arthritis
Cellulitis	SLE
Hematologic malignancy	
Juvenile idiopathic arthritis	

APPROACH TO MANAGEMENT

If fully immunized, empiric antibiotics

- First generation cephalosporin
- Common: Cefazolin 100-150mg/kg/day IV q6-8h

If risk of MRSA

- Same as above and ADD Vancomycin until further testing confirms MRSA negative

If age <4yo, and unimmunized

- Empiric therapy with IV cefuroxime to also add coverage for *H. influenzae*

With cultures and susceptibilities

- Switch to targeted therapy specific to pathogen

Post hospital stay

- Switch to PO antibiotics with clinical improvement and decreased CRP (usually within a week) or following consultation with Pediatric Infectious Diseases.
- Treat for a total of 3-4 weeks with antibiotics if uncomplicated.

CONSULTS

- In the community?** - Referral to hospital for further assessment and initiation of IV antibiotics
- Abscess, septic joint, complicated course?** - Consult Pediatric Orthopedic Surgery
- Atypical bacteria or fungi?** - Consult Pediatric Infectious Disease