Osteomyelitis

1. Definition
    a. Inflammation of bone generally caused by pyogenic organism
    b. Usually caused by blood-borne bacteria that localize in the metaphysis
2. Signs and symptoms
    a. Low grade fever
    b. Malaise
    c. Limp/failure to walk
    d. Pain (>50% of cases)/localized tenderness
    e. Swelling/erythema
3. Causes
    a. Hematogenous spread
    b. Direct inoculation
        i. Trauma
        ii. Surgical trauma
    c. Bacteria
        i. Neonate- GBS, S. aureus, GN coliforms
        ii. Infant-4 yo- S. aureus, streptococci, H. flu
        iii. >4 yo-S. aureus
        iv. Sickle cell- salmonella
        v. Recent chicken pox- streptococcal
        vi. Trauma through shoe/to foot- pseudomonas
        vii. Drug use-pseudomonas, serratia marcescens
4. Epidemiology
    a. Infant/young kids>teens
    b. Boys>girls
    c. Legs>Arms
5. Pathogenesis
    a. Bacteria from blood seeds metaphysis
        i. Prefers metaphysis due to:
            1. Slow terminal circulation leading to secondary thrombosis which allows more bacterial proliferation
    b. Trauma can cause direct inoculation or further metaphyseal vascular compromise
    c. Pus is formed
        i. Moves to the sub-periosteal space and causes elevation of periosteum
    d. Bone necrosis
        i. From further lack of blood supply due to periosteal lifting
6. Complications
    a. Antibiotic failure
        i. Due to difficulty getting antibiotics to site of infection due to poor blood flow to area
    b. Growth disturbance
        i. More common in <18 mo

        ii. Increased, decreased growth
        iii. Deformation/angulation
    c. Joint infection
        i. More common in <18 mo
        ii. More common in hip
    d. Chronic osteomyelitis
7. Differential diagnosis
    a. Septic arthritis
    b. Acute rheumatoid arthritis
    c. Acute rheumatic fever
    d. Malignancy
    e. Bone infarction
    f. Toxic synovitis
8. Tests/diagnosis
    a. Labs
        i. Normal WBC
        ii. Elevated ESR
        iii. Elevated CRP- better for following treatment
        iv. Bone culture- needle aspirate or open culture
        v. Blood culture
    b. Radiology
        i. Xrays-may take 2 weeks
            1. Elevation of periosteum
        ii. Bone scan-will show in first 24-48 hours
            1. 90% sensitive but not specific(trauma/tumor)
        iii. CT/MRI
9. Treatment
    a. Antibiotics-selected based on culture
        i. If culture neg- based on concurrent/recent infection and age
        ii. Usually IV until improving then consider oral
            1. Can follow ESR/CRP
    b. Surgical debridement