Musculoskeletal Infection

Objectives
1. Risk factors for infection
2. Clinical, laboratory, and radiographic evaluation
3. Treatment Strategies
4. Prevention

Causes and Risk Factors
Host Factors
- Systemic: immunocompromised, diabetes, advanced age, renal disease, smoking, obesity, drug use
- Local: peripheral vascular disease, venous stasis, skin lesions, neuropathy, history of radiation Rx

Injury-related Factors
- Open fractures (especially tibia), gross contamination, amount of soft tissue injury/periosteal stripping, fracture blisters/swelling, need for soft tissue coverage

Technical Factors
- Infection more common after ORIF.
- Avoid excessive soft tissue damage during surgery.
- Quality of debridement.
- Time to antibiotics and debridement.

Clinical Evaluation
- Pain, swelling, erythema, fluctuance, drainage, sinus tracts, non-healing wounds, dehiscence

Laboratory Evaluation
- WBC: Can be elevated in acute infection, often normal in chronic infections. Not very sensitive.
- ESR: Elevated in >90% of infections, but can be normally elevated for up to 6 mos after surgery. Not very specific.
- CRP: Can be elevated for up to 3 weeks postop. More sensitive than ESR. Good for tracking treatment response.

Intraoperative cultures – gold standard for diagnosis

Radiographic Evaluation
- Serial plain radiographs: most important. Look for lucency around screws, screws backing out, soft-tissue swelling, catastrophic hardware failure and/or loss of reduction
- Consider advanced imaging if it will change your treatment:
  - CT – can identify soft tissue abscess/fluuid collections, air/gas, presence or absence of union
  - MRI – can provide some fine details about the infection, including extent of osteomyelitis.
  - Consider administration of contrast
  - Tagged WBC scan – most expensive and likely least effective study.

Treatment Strategies
- Timely debridement with intraoperative cultures
- Consider whether hardware can be retained or needs to be removed – is the fracture healed, or does it need stability?
- Infectious disease consultation
- Appropriate management of medical co-morbidities
- Set patient expectations and outline treatment plan

Prevention
- Immediate antibiotic administration for open fractures with a timely debridement
- Meticulous soft tissue handling and wound closure
- Manage medical co-morbidities