1. **What is your general approach to a patient with acute monoarthritis?**
   - When dealing with a single joint location, need to check to make sure it is actually arthritis, as you need to consider the following:
     - Bursitis
     - Tendonitis
     - Cellulitis (important, as you don’t want to stick a needle through an area of cellulitis)
     - Panniculitis
   - Main categories of arthritis
     - Infective
     - Crystal-induced arthropathies (gout, pseudogout)
     - Trauma (occasionally)
     - Haemarthrosis
     - Immune dysregulation arthropathies (e.g. psoriatic arthritis, reactive arthritis)

2. **How do you differentiate between different types of arthritis on history?**
   - A hot swollen joint is a diagnostic emergency – need to make the diagnosis as quickly as possible
   - Need to prioritise the exclusion of infection on history
   - Elements of history that would be suggestive of:
     - **Septic arthritis**
       - History of intravenous drug use
       - Leg ulcers
       - Recent infection
       - Recent bacteraemia
       - Intravenous devices e.g. cannulas
       - Evidence of immunosuppression (drugs, diabetes, HIV)
       - Pre-existing joint disease (can be a risk factor for septic arthritis)
     - **Gout**
       - Biggest clue – previous episode of gout
       - Risk factors
       - Obesity/overweight
       - High risk racial group – Maori/Polynesian
       - Renal failure
       - Heavy alcohol use
     - **Pseudo-gout**
       - Biggest risk factor is age
       - Calcium pyrophosphate can be detected in 30% of people over the age of 80
       - Can be associated with heavy blood staining in joint fluid though not a real haemarthrosis
• Trauma  
  o Be careful – as often people naturally try to justify their swollen joint (irrespective of aetiology) as a consequence of a recent trauma  

• Haemarthrosis  
  o Anticoagulation  
  o Haemophilia  
  o Acute pseudo-gout can be associated with heavy blood staining in synovial fluid (not a true haemarthrosis)  
  o Surrounding muscle tear (e.g. glenohumeral joint can have blood from rotator cuff tear)  

• Immune dysregulation disorders  
  o Often other joints have been involved  
  o Diffusely swollen toe or finger (‘dactylitis’) – push you towards psoriatic/reactive arthritis  

Case - A 60 year old male with history of type 2 diabetes and osteoarthritis presents with an acutely swollen red and painful right knee. Febrile to 38 degrees, on examination he is unable to move that knee due to pain. You suspect septic arthritis.  

1. How do you approach examination of mono-arthritis and differentiate it from other acute causes?  
   • With bursitis or cellulitis, often have relatively preserved range of motion in the knee  
   • If pre-patellar bursitis – often get a characteristic golf-ball sized swelling on top of the knee-cap  
   • Involvement of deep infra-patellar bursitis can be difficult to differentiate from a septic knee joint but suspect this diagnosis if the swelling is mainly anterior and you cannot get positive bulge on swipe test – you may need to get expert help before aspirating the knee joint  
   • Fever – favours septic arthritis (occasionally get fever with non-septic polyarthritis)  

2. Can you exclude septic arthritis on clinical examination alone?  
   • Absence of swelling, fevers, erythema tends to go against diagnosis of septic arthritis  
     o In this case patients should be given careful instructions to represent if signs of septic arthritis develop  
   • A red, hot swollen joint, even in the presence of history of gout or rheumatoid arthritis, often still requires aspiration to exclude septic arthritis  

3. What investigations would be order before aspirating the joint?  
   • X-ray – looking for calcium pyrophosphate crystals, fracture, getting an understanding of baseline state of joint  
   • Blood tests – may help in management but not necessarily diagnosis. Do not need to wait for results prior to aspiration. Look for inflammatory markers – CRP and ESR. Liver and renal function would be helpful.  
   • Blood cultures essential if infection suspected  

4. How do you perform arthrocentesis – what does this procedure generally involve?  
   • Remember, bedside arthocentesis should never be performed on patients with artificial material in the joint e.g. previous joint replacement – such a procedure should be performed by orthopaedic surgeons in the operating theatres  
   • Otherwise – clean (not necessarily sterile) procedure:  
     o Antiseptic to skin; allow adequate time to dry  
     o Must be able to feel joint lines or fluctuant swelling  
     o If unable to identify these, need to seek help – may require image guided insertion
Can send fluid in sterile yellow-top jar

- All fluid that can easily come out should be removed
- If there is strong suspicion of inflammation (e.g. gout) but just excluding septic arthritis then no harm in injecting corticosteroids into joint AFTER sending off for fluid for analysis

5. What tests do you request for analysis of fluid from aspiration?

- Cell count, gram stain, culture and crystal identification
- Note: There are situations where very little fluid is obtained
  - Often there is diagnostically useful material within the needle itself and the doctor should personally take down the needle and syringe to the laboratory or directly to a rheumatologist for the material to be examined under the microscope
  - Otherwise the syringe can be sent to the lab without the needle

6. How do you interpret synovial fluid analysis?

- Positive Gram stain is proof of septic arthritis
  - Unfortunately only positive in 50% of proven septic arthritis
- Negative Gram stain and positive crystals
  - Treat presumptively as crystal arthropathy
  - Irrespective of how high the WBC count
  - Fluid should still be sent off for culture and to chase these results
- If WCC > 50,000, negative gram stain and no crystals
  - Treat as septic arthritis as likelihood of infection is high
  - Refer to orthopaedic surgery
  - Diagnostic but not therapeutic emergency
  - If not septicaemic, then immediate antibiotic not critical and can afford to await expert opinion if confirmation of diagnosis still required

7. What is the general management for septic arthritis?

- Empirical antibiotics for staph aureus usually involves IV therapy with flucloxacillin, cefalothin or cephazolin
- If gonococcal arthritis suspected – ceftriaxone
- If colonised with MRSA – usually other antibiotics
- Duration of therapy changes depending on organism
  - If staphylococcus (most common) – will need IV antibiotics for 4 weeks and occasionally up to 6 weeks
  - Thus in cases where it is not clear, then careful observation of patient over next few hours may be more appropriate before committing them to such long duration of treatment
- Arthroscopic washout may be indicated in the following scenarios:
  - Late presentation
  - Evidence of developing loculation
  - Unable to aspirate joint to dryness