# Knee Effusion Aspiration Skill

# Course 452

## ***Goal:***

The student will be competent to do knee aspiration and analyze the synovial fluid.

## ***Objectives:***

To be able to perform knee joint effusion aspiration properly with no or minimal risk of complication(s), and to be able to differentiate between different appearance and consistencies of the synovial fluid. The students will be performing this procedure on a manikin in the education center skill lab, under the supervision of the orthopedic surgeon assigned.

## ***Principles of Knee Joint Aspiration:***

- Consent (patient or guardian).
- Patient supine in bed and a small cushion under the knee to flex it (30°).
- Identifying boney landmarks of the knee joint.
- Instruments needed: sterile gloves and cleaning set, antiseptic solution, syringe, local anesthesia.
- Tubes needed and for what:
    - CBC: cell count (WBC and RBC).
    - 4-5 sterile tubes: gram stain, C/S, histopathology, biochemistry, and if suspecting ask for T.B- brucella- and fungus.
    - 2 blood culture tubes: aerobe and anaerobe.
- Cleaning and draping the knee under aseptic conditions.
- Possible entry points: joint line or supra patellar pouch.
- How to aspirate and exchange syringes.
- How to analyze the aspirate: amount, color, consistency, any content, and viscosity.
- Cover and bandage the aspiration site.

**KEYPOINTS**
**Knee Aspiration (Arthrocentesis)**

The knee joint is the most common and the easiest joint for the physician to aspirate.

Knee joint aspiration and is performed to establish a diagnosis, relieve discomfort or instill medication.

## Indications

### A. Diagnostic

- Diagnosis of suspected septic arthritis.
- Identification of crystal arthropathy.

### B. Therapeutic (Rare)

- Relief of pain by aspirating effusion or blood and Injection of medications.

## Contraindications

Relative contraindications include the following:

- Cellulitis overlying the joint.
- Uncontrolled coagulopathy.

## Equipment

- Sterile gloves and drapes
- Gauze pads, 4 × 4 in.
- Skin preparatory solution (alcohol or chlorhexidine)
- Lidocaine 1%.
- Syringes: 60 mL.
- Needles, 18 gauge.
- Patients who are morbidly obese might require a 21-gauge spinal needle for arthrocentesis.
- Specimen tubes, blood culture tubes: specimen will be sent for (cell count, Gram stain, AFB, aerobic and none aerobic cultures, fungal, TB cultures and crystals.
- Bandage.

## Patient Preparation

Adult patient should be relaxed.

For pediatric patient, it should be done in operating room or under conscious sedation.

**Approach**

**Lateral suprapatellar approach**

Remember that in 10% of the population, the suprapatellar bursa does not communicate with the knee joint.

For large effusion.

Knee extended on the bed.

Insert the needle 1 cm above and 1 cm lateral to the superior lateral aspect of the patella at a 45-degree angle.

## Patient advice after therapeutic aspiration/injection:

- Advise the patient to rest the joint for 1-2 days and to avoid strenuous use for five days (rest the joint).
- Warn the patient that the joint may be painful for a while and advise on use of analgesics.
- Following injection, patients should be warned that they might experience worsening symptoms during the first 24-48 hours (related to a possible steroid flare) which can be treated with ice and NSAIDs. If pain is severe or increasing after 48 hours, seek advice.
- Warn about possible other side-effects. Advise to seek help if systemic side-effects develop suggesting infection.
- Arrange appropriate follow-up.

**Possible scenarios for knee aspirates:**

- Thick pus (septic arthritis): patient must be admitted for emergency knee joint washout and Intravenous broad spectrum antibiotic therapy.
- Blood (heamarthrosis): if no fracture, same advices as for therapeutic arthrocentesis.
- Blood and fat droplet (fracture is present): should be managed as fracture principles.
- Straw color fluids (crystal induced arthritis vs rheumatological cause): fluid must be sent for same cultures as mentioned before with stress on crystal under light microscopy.