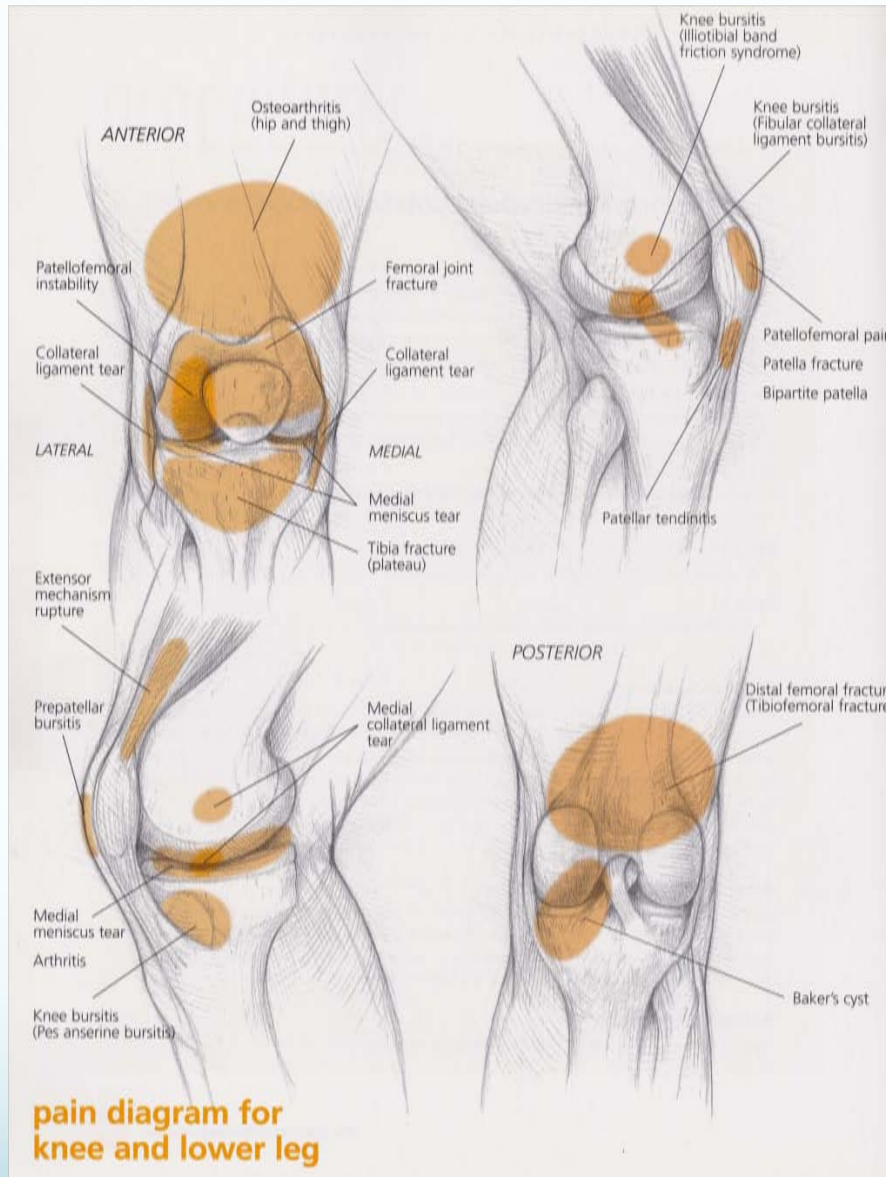


# Knee Arthrocentesis

Kurt Ortwig NP

NorthShore University Health System



# Indications

- Aspiration of Fluid (Arthrocentesis)
  - Diagnosis
  - Relief of pressure
- Injection of Medications
  - Glucocorticoid
  - Local anesthetic
  - or a combination of the two.

# Diagnostic

- Fluid Analysis
  - Unexplained joint swelling
  - Suspected crystal-induced arthritis
    - Acute arthritis
    - Intercritical gout
  - Suspected septic arthritis

# Joint Effusion Categories

- Noninflammatory
  - Osteoarthritis / trauma
- Inflammatory
  - RA, gout, pseudogout, ankylosing spondylitis, SLE,
- Septic
  - Bacterial / Fungus /mycobacteria
- Hemorrhagic
  - Trauma / Anticoagulants / neoplasms

# Synovial Fluid Analysis

- Normal
  - Highly viscous
  - Clear
  - Essentially acellular
  - Protein concentration approximately one-third that of plasma
  - Glucose concentration similar to that in plasma

### Categories of synovial fluid based upon clinical and laboratory findings

Measure	Normal	Noninflammatory	Inflammatory	Septic	Hemorrhagic
Volume, mL (knee)	<3.5	Often >3.5	Often >3.5	Often >3.5	Usually >3.5
Clarity	Transparent	Transparent	Translucent-opaque	Opaque	Bloody
Color	Clear	Yellow	Yellow to opalescent	Yellow to green	Red
Viscosity	High	High	Low	Variable	Variable
WBC, per mm <sup>3</sup>	<200	0-1,000	1,000-100,000	15,000- >100,000*	200-2,000
PMNs, percent	<25	<25	≥50	≥75	50-75
Culture	Negative	Negative	Negative	Often positive	Negative
Total protein, g/dL	1-2	1-3	3-5	3-5	4-6
Glucose, mg/dL	Nearly equal to blood	Nearly equal to blood	>25, lower than blood	<25, much lower than blood	Nearly equal to blood

\* Lower part of range with infections caused by partially treated or low virulence organisms.

Graphic 76506 Version 2.0

# Nucleated Cell Counts

- Inflammatory and septic fluids have increasing proportions of polymorphonuclear / PMNs present. Bacterial joint infections often have  $\geq 75$  percent PMNs
- Eosinophilia in the synovial fluid suggests parasitic infection, allergy, neoplasm, or Lyme disease
- Malignant appearing cells may be noted in synovial fluid



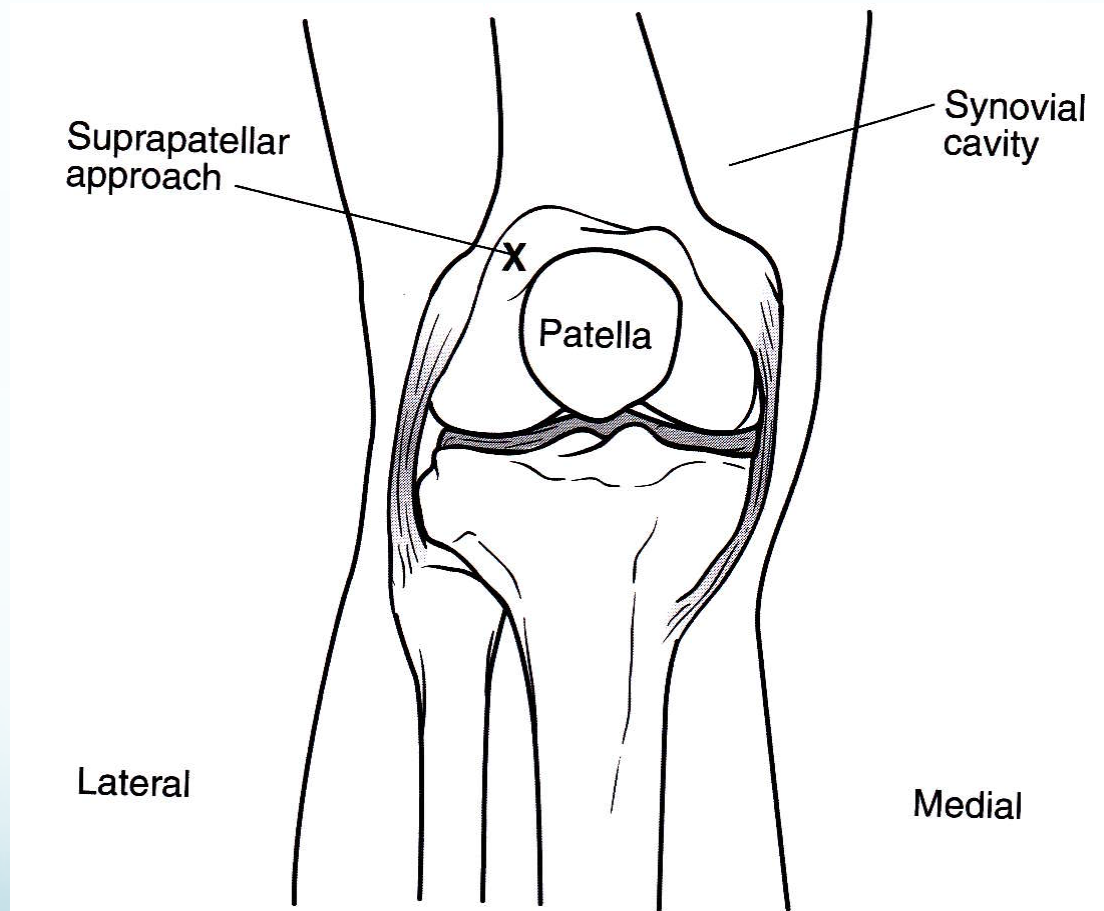
# Pain Relief and Intra-Articular Medications

- Injection of joints with inflammatory arthritis
  - Marcaine 3-4ml
  - Kenalog: 40mg (40mg/ml)
  - Combination
- Side Effects
  - 10% experience flushing
- Infection rate: 1:3200

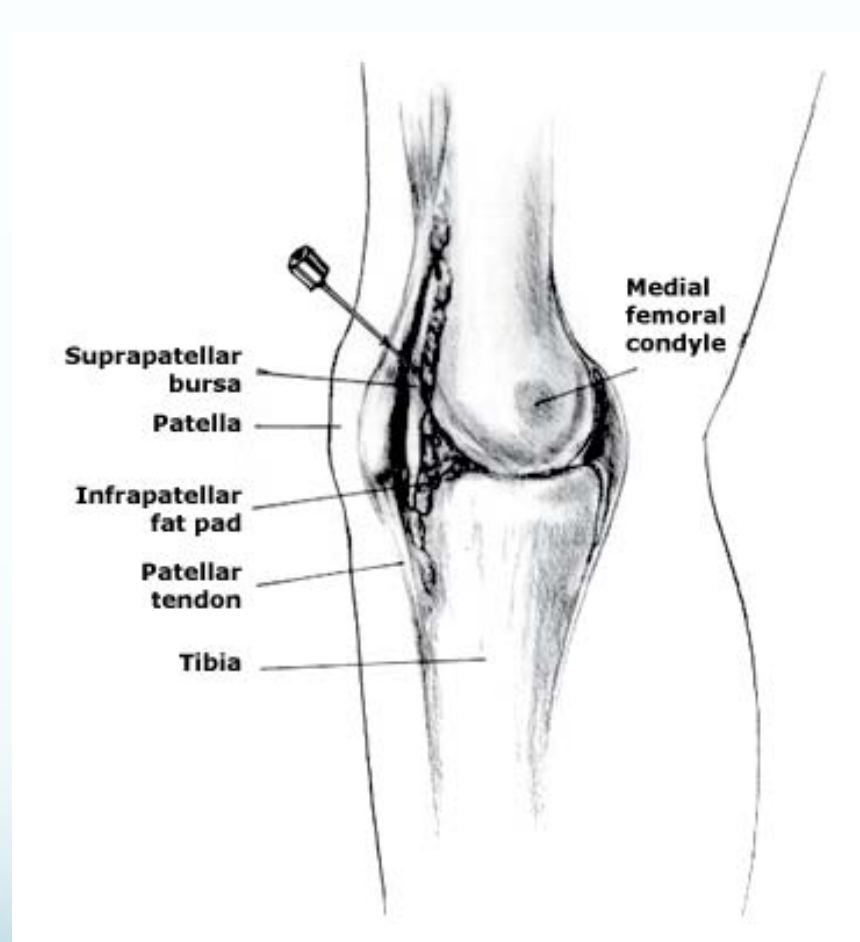
# Procedure

- Strict Sterile Technique maintained throughout procedure
- Maintain patient in supine position with affected knee in extended position or slightly bent
- For Lateral approach, inspect knee and note landmarks.
- For large effusions, effusion may extend 1 hand width above the superior aspect of patella.

# Lateral Approach



# Medial Approach



# Procedure cont...

- Lateral approach is 1cm superior and 1cm lateral to superolateral aspect of the patella.
- Prep skin: betadine x3
- Lidocaine wheel 3-5ml @ point of entry
- Using a 18g needle attached to 30ml+ syringe, enter through the anesthetized site.
- As you advance needle, may feel a pop as you go through joint capsule.
- Maintain negative pressure as needle advances.

# Procedure cont...

- Problems with flow
  - Needle not completely into joint capsule
  - Synovial tissue blocking
  - Thick synovial fluid
  - Reposition needle and reattempt aspiration.
- Instill any medications if necessary
- Withdraw needle and cover with bandaide.

# Lab Orders

- Crystal analysis
- Culture with Gram Stain
- Cell Count
  
- Label syringe at bedside with patient sticker
- Can send syringe to lab with plastic cap so sample can be divided appropriately for testing