Knee and Shoulder Injection Workshop

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Outline

- Common sites of injection
- Indications and contraindications
- Considerations
- Consent
- Positioning
- Documentation
- Preparation/Sterile Technique

The Most Common Injection Sites

- Knee Joint
- Subarcromial Bursa
- Glenohumeral Joint
- AC joint
- Greater Trochanteric Bursa (Hip)
- Lateral Epicondyle (elbow)

Diagnostic Indications

- Evaluate fluid for:
  - Infection
  - Inflammatory arthropathies
  - Trauma
- Immediate pain relief often indicates inflammatory condition.

Therapeutic Indications

- Relief of pain/inflammation from:
  - Arthritis
  - Tendonopathies
  - Bursitis
  - Trauma
  - Gout
  - Rheumatoid Arthritis

Relative Contraindications

- Anticoagulated patient
- Injection within the last 3 months
- Minimal or no relief with 2 prior injections
- Diabetes
- Immunocompromised patient
- Inaccessible joints
- Unstable joints

Absolute Contraindications

- Local cellulitis (overlying)
- Septicemia/Bacteremia
- Allergy or Hx of anaphylaxis to injection medications
- Prosthetic joint (unless you put it in)
- Acute or Subacute fracture
- Patella and Achilles tendonopathy

Medications - Theories

- Steroids
  - Suppress Inflammation in acute phase
  - Stop inflammatory damage-repair-damage cycle (chronic)
- Anesthetic
  - Direct analgesia
  - Diagnostic of intra-articular etiology
  - Dilution (greater effect on larger area)
  - Distension (of the joint)
- Hyaluronic acid
  - Lubrication
  - Distension

Steroids

- Methylprednisolone * (greatest potency)
  - Depo-medrone (40mg/ml)
- Triamcinolone
  - Adcortyl (10mg/ml)
  - Kenalog (40mg/ml)
- Hydrocortisone
  - hydrocortistab(25mg/ml)

Steroids

- Betamethasone (Celestone Soluspan)
  - Long acting
  - 6-12mg for large joint (knee, shoulder)
  - 1.5-6mg for small/intermediate joints

Anesthetics

- Lidocaine 1% (Xylocaine) w/o epinephrine
  - Intra-articular injection and local when aspirating
  - Fast onset
  - Diagnostic

Anesthetic

- Bupivicaine (0.25%) (Marcaine)
  - Possible cause of chondrocyte death (reported with continuous infusion in mice)
  - Frequently used

Complications

Complications	Estimated prevalence
Postinjection flare	2–10%
Needle Fracture	<0.001%
Tendon rupture	<1%
Facial flushing	<1%
Skin atrophy, depigmentation	<1– 4%
Iatrogenic infectious arthritis	**<0.001 to 0.072%**
Transient paresis of injected extremity	Rare
Hypersensitivity reaction	Rare

Steroid Arthropathy

- A well known complication of local injections
  - Largely a myth
  - Cases reporting osteonecrosis were associated with high dose PO steroids and/or high dose and high frequency injection (1 per month for 6 – 12 months)
  - Evidence supports injections every 3-4 mos for up to 2 years as safe.

Adverse Reactions

- Loss of glucose control in DM (short term)
- Increased appetite
- Insomnia
- Irritability

Considerations

- Evaluate the patient
- Patient education
- Consent
- Patient positioning
- Sterile preparation and technique
- Documentation

Examine the Patient

- Avoid the common reaction to give anyone with joint pain an injection
- Obtain a good history
- Examine the other joints
- Obtain x-rays
- **MRI only if appropriate**

Patient Education

- Inform patient:
  - Medications in the syringe (allergies?)
  - Expected results (including what it won't do)
  - Approximate time for results
  - Next step if injection is ineffective

Consent

- Verbal or Written
  - Physician dependent or facility dependent

Positioning

- Knee
  - Seated (Lateral portal)
  - Supine (superolateral approach)
- Shoulders
  - Seated (watch for vasovagal)
  - Ethyl chloride (cold spray)
  - Distraction/pain reliever
  - Will drip onto clothes

Sterile Technique

1. Expose site
2. Use alcohol, betadine or chlorhexidine prep
3. Use aseptic technique
4. Consider use of sterile gloves
5. Sterile drapes/towels are optional

Following the Injection

- Band-Aid
  - Pressure dressing on bleeders
- Rest and Ice for 24 hours
  - Anesthetic wears off, pain often returns
- Warn about potential steroid flare

Documentation - Exam

- In H&P, note all exam findings to support the decision to aspirate or inject
- Site (joint and what side)
  - Specify GH vs subacromial, etc.
- Medications and Doses used
- Expiration dates and lot numbers
  - Recently problematic

Document - Fluid

- Amount of fluid aspirated
- color, clarity and viscosity of fluid
- purulent?
- Blood? (trauma)
- Lipid?(trauma/occult fx)

What to Order When Sending Fluid

- Labs:
  - Cell Counts
  - Cultures (Aerobic & Anaerobic)
  - Gram stain
  - Crystal Analysis
  - ?Fungal
  - ? Lyme

Dosing Recommendations by Location

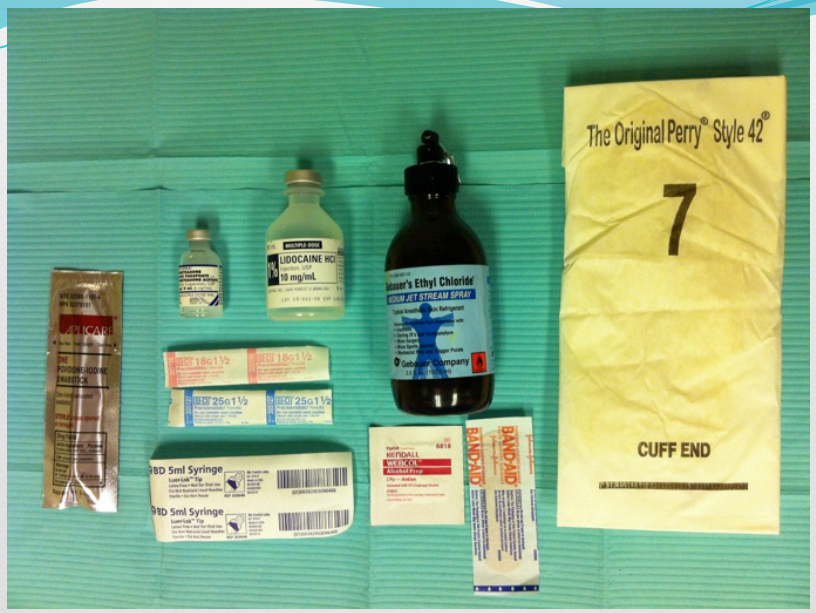
- Knee
  - Intra-articular (1 cc steroid: 4-6 cc anesthetic)
- Shoulder
  - SA (1 cc steroid: 3-6 cc anesthetic)
  - AC (1cc steroid: 1 cc anesthetic)
  - GH (1 cc steroid: 3-6 cc anesthetic)

What You Will Need

- Alcohol wipes/Betadine/Chloroprep
- Gloves (sterile/nonsterile)
- 20 – 25 gauge 1.0 – 1.5 inch needle*
- 1 mL to 10 mL syringe**
- Local anesthetic
- Corticosteroid preparation
- Ethyl Chloride (optional)
- Adhesive bandage dressing

*18 gauge for aspiration, can numb tract
**Multiple 60cc syringes may be required if aspirating

http://www.gebauer.com/Products/Gebauer-s-Ethyl-Chloride-1/



http://medconnections.com/drugs/equip/ideal/guide/images/-3.jpg

Injections

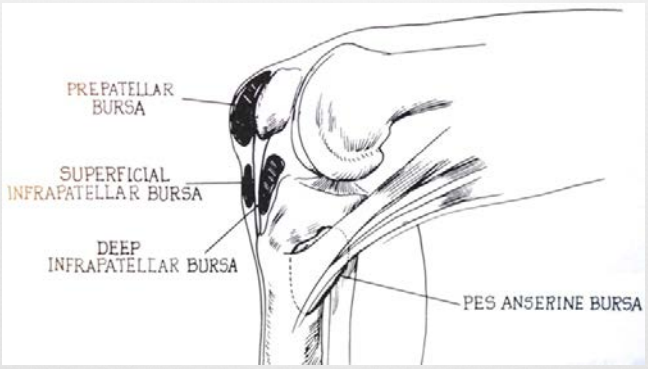
- Knee
  - Intra-articular
- Shoulder
  - GH
  - Subacromial
  - AC joint

Knee Injection Sites

http://www.knee-explained.com/knee.jpg

- Superolateral Patella
- Lateral portal
- Medial portal

Knee Bursa



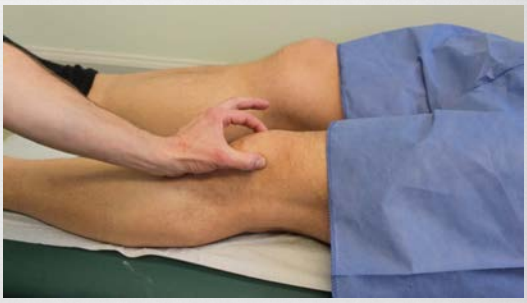
http://www.knee-image/knee-pain-flatb.jpg

The Knee

- Superolateral approach most reliable
  - 93% accuracy vs. 71-75% with bent knee anteromedial/anterolateral approach
  - Lowest risk of tendinous or ligamentous injury

Superolateral Approach

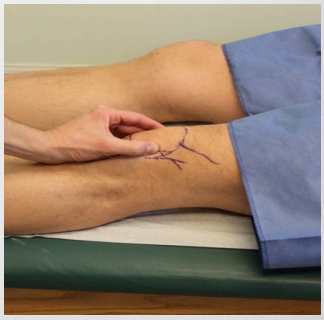
- Patient Supine with knee extended
- Palpate bony landmarks
  - Patella
  - Lateral Femur



http://orthostreams.com/2013/06/aaos-/placement

Superolateral Approach

- Palpate lateral border of patella and Lateral femur at the PF joint
- Draw the patella laterally with your contralateral hand and palpate the soft spot
- Soft spot = Ideal injection site



http://orthostreams.com/2013/06/aaos-the-knee/place

The Injection

- Reassure patient
- Relaxed quads = more space at PF joint
- Needle Trajectory
  - 15-20 degrees posterior

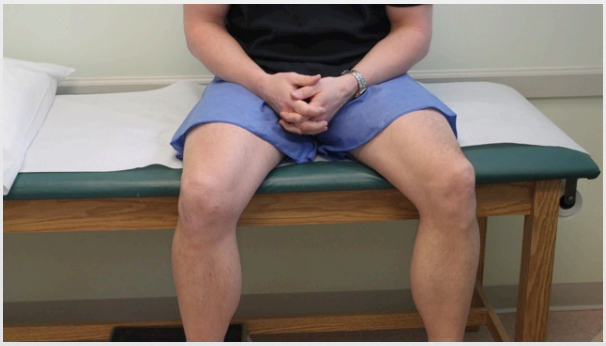
http://sitemaker.umich.edu/fm_gmeig_musculoskeletal_joint-inject-aspir/knee_injectionimages (need website)

Needle Trajectory

Anterior Approach (medial or lateral)

- Not as accurate as superolateral approach
  - Greater risk of fat pad injection(source of pain)
- Can be easier in the obese knee, or if patient can't tolerate laying down.
- Patient sitting with knee bent to 90 degrees

Anterior Approach (bent knee)



Injectionsinprimarycare

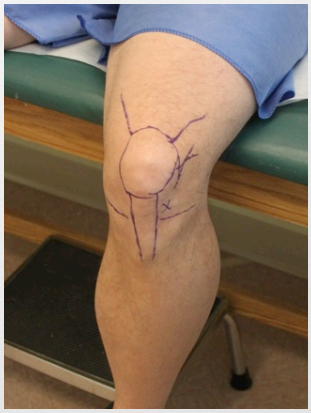
Anterior Approach

- Palpate landmarks
  - Inferior pole of patella
  - Patella tendon
  - Tibial Plateau

http://injectioncourses.blogspot.com/

Injection

- May inject medial or lateral to patella tendon
- ~ Half the distance from plateau to inferior pole of patella
- Trajectory toward intercondylar notch
- Must aspirate to assure not in vessel
- If you feel resistance to injection, pull back gently to avoid injection into ligament



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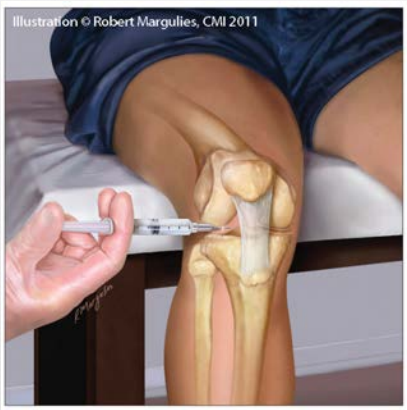
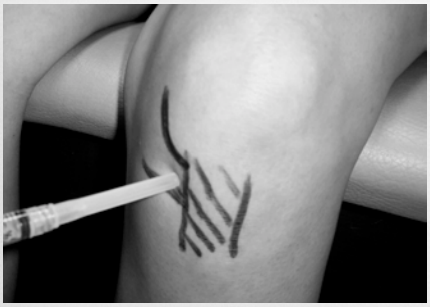
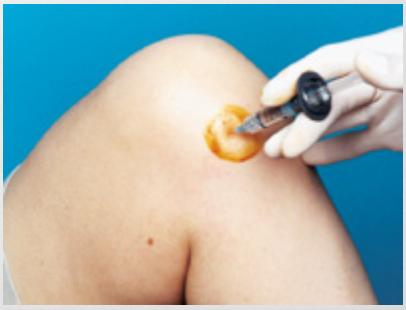
Lateral Portal



http://www.rheumatologynetwork.com/sites/default/files/rm/1873633.png

Medial Portal





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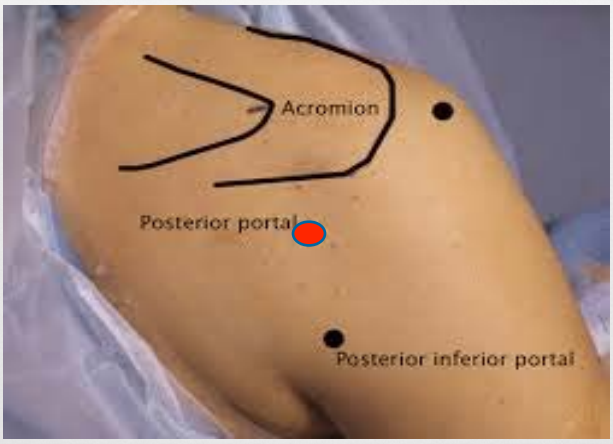
Shoulder (GH joint)

- Posterior approach
- Position patient sitting with arm at side
- Palpate bony landmarks
  - Clavicle
  - Coracoid
  - Posterolateral acromion
    - Approx 1-2cm inferior
    - Approx 1cm medial
    - Find soft spot
    - Using contralateral hand with finger on coracoid
    - Trajectory is toward the coracoid with slight caudad tilt
    - If resistance is felt, slight adjustment in needle is necessary

Shoulder (SA Bursa)

- Posterior
  - Repeat same steps as GH injection
  - Trajectory is 10-30 degrees cephelad
- Lateral
  - Trajectory is approximately 5-10 degrees caudad

Landmarks



http://injectioncourses.blogspot.com/

http://injectioncourses.blogspot.com/

Shoulder

- Needle placement accuracy (Kang, 2008)
- 60 shoulders with impingement
- 70% subacromial accuracy rate
- No differences among injection approaches
- Clinical improvement did not correlate with accuracy

Postinjection Flare

- Occurs and resolves within 48 hrs
- Occurs in about 10% of people
- Flares occur more frequently in soft tissue injections (Roberts, 2005)

Questions?

Thank you

Resources

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