



Common Office Procedures

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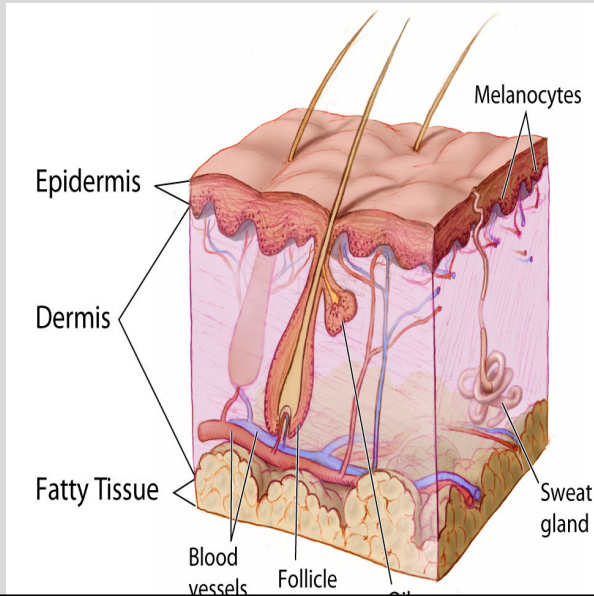
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Objectives

- Review normal skin anatomy
- Define cryosurgery
- Discuss the indications
- Illustrate some techniques for cryosurgery
- Describe contraindications and post surgical care for cryosurgery

Skin Anatomy



Knowledge of skin anatomy is critical to an effective procedure and understanding potential complications

- Epidermal thickness 0.05-1.5mm
- Dermal thickness 0.6-3mm

Cryosurgery

- Use of extremely low temperatures to produce local tissue destruction
- Liquid nitrogen most commonly used professionally
 - Produces much colder temps (-168C) than OTC products (i.e. dimethyl ether -24C)
- Relative contraindications
 - Cold sensitivity (i.e. cold urticaria)
 - Ill-defined lesion, location (eyelid), tanned or dark skin

Cryosurgery - Vehicles

- Spray-tip canister
 - Direct contact not needed
- Cotton-tip applicator
 - Very precise
 - Small lesions near eyes
 - Children
- Metallic instrument
 - Frozen in LN
 - Clamp to skin tag

Cryosurgery - Mechanism

- Heat is transferred away from cells to the LN - causing tissue necrosis
- The freezing causes cell destruction
 - ice crystal formation
 - cell membrane disruption
 - vascular stasis
- Rapid cooling and slow thaw maximizes tissue destruction

Cryosurgery - Indications

- Benign lesions - skin tags, seborrheic keratosis, warts, molluscum, keloids, solar lentigines
- Pre-malignant lesions - actinic keratosis
 - Take care to biopsy any suspicious lesion for SCC
- Malignant lesions – superficial basal cell carcinoma, squamous cell carcinoma in situ
 - Used for thin, well defined lesions when other treatments are contraindicated (rare)
 - Require longer freezing times to reach lower tissue temperature

Cryosurgery - Technique

- Freeze fast, thaw slowly
 - Better intracellular ice formation is more damaging
- Repeat freeze-thaw cycles for maximal destruction
- General parameters for benign and pre-malignant lesions:
 - 1 to 2 cycles of 3-10 second freeze with 2mm lateral spread

Cell Type	Temperature range for destruction
Melanocytes	- 4 to -7 C
Benign lesions	-25 to -50 C
Malignant lesions	At least -50C

Cryosurgery Video



Cryosurgery – Post Procedure Care

- Daily cleansing with soap and water
- Petrolatum ointment
- Sun protection
- Healing expected within 1-3 weeks

Cryosurgery – Post Procedure Expectations

- Expected side effects: Pain, edema, erythema, blister and crust formation
- Complications
 - Common: hypopigmentation (mild degree of freezing (-5C) to irreversibly damage melanocytes)
 - Uncommon: scarring, nail dystrophy, alopecia



Common Office Procedures Skin Biopsies

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Skin Biopsies

- Obtain informed consent
 - Risks:
 - Pain
 - Bleeding
 - Infection
 - Scarring
 - Potential need for additional procedures
 - Benefits
 - Diagnosis and
 - Potentially curative treatment

Skin Biopsies- Relative Contraindications

- Bleeding Risk- severe thrombocytopenia, bleeding disorder, or anticoagulant/antiplatelet use
- History of keloid scarring
- Infection at biopsy site
- Anesthetic allergy
 - More common with esthers than amides
 - Often due to a preservative rather than the anesthetic itself
 - Options
 - Anesthetic of alternative class in preservative-free formulation
 - 1% diphenhydramine solution
 - Normal saline

Skin Biopsies- Bleeding Risk

- Biopsy may still be performed but hemostasis may be delayed
- Areas more prone to bleeding
 - Lower legs, hands, feet, digits, lips, and scalp
- Use anesthetic with epinephrine
 - Caution with tips of ears, fingers, toes, and genital area
 - May need to use aluminum chloride, pressure dressing, or absorbable sponge

Shave Biopsy

- Most common skin biopsy technique
- Diagnostic role- obtain specimen for histologic exam
- Therapeutic role- removed inflamed or symptomatic lesion
 - If the intent is complete lesion removal then the term “shave excision” or “shave removal” is used

Shave Biopsy

- Best for epidermal and superficial dermal processes
 - Biopsy of suspected basal cell carcinoma or squamous cell carcinoma
 - Removal of skin tags and other benign exophytic neoplasms

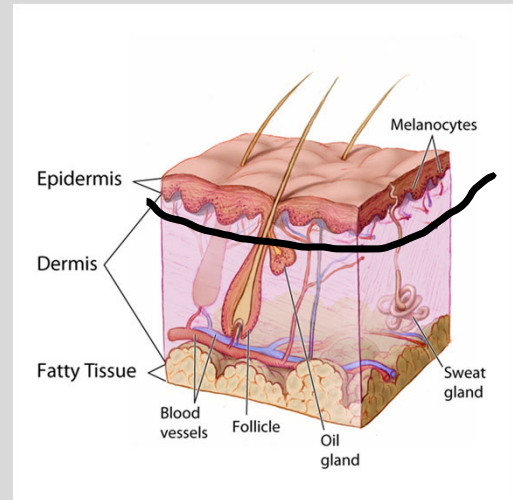


Image from National Cancer Institute

Shave Biopsy

- Local anesthesia used to produce a wheal under the lesion
- Use a 10- or 15- blade or single edged razor blade held semi-curved
- Move through skin in a sawing motion horizontally
 - Entering epidermis to depth of superficial dermis
- Goal is a shallow, saucer-shaped defect with a single intact specimen
- Submit specimen in 10% formalin or Michel's solution for immunofluorescence

Shave Biopsy Video



Punch Biopsy

- Deeper sampling than shave biopsy
- Diagnostic role- obtain specimen for histologic exam
 - Useful for rashes, dermal or subcutaneous nodules, melanocytic neoplasms
- Therapeutic role- removal of small dermal neoplasms
 - “benign excision” or “punch removal” are best terms
 - Useful for cysts, inflamed dermal nevi

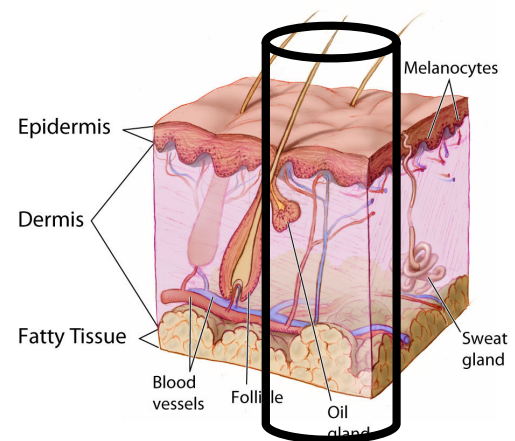


Image from National Cancer Institute

Punch Biopsy

- Common punch tools vary from 2 mm – 10 mm
 - 4 mm is most common
- Oval-shaped defect is optimal
 - Create by spreading skin perpendicular to relaxed skin tension lines during biopsy
- Push and rotate punch tool to subcutaneous tissue (hub of the punch tool)
- Forceps and scissors can be used to extricate the specimen



Punch Biopsy Closure

- Let close by secondary intention if < 4 mm
- Sutures generally provide best closure
 - Nylon or polypropylene monofilament- require removal
 - 3-5 days for face (use 6-0)
 - 7-10 days for scalp and neck
 - 10-14 days for remainder of body
 - Fast-absorbing gut dissolves
- Wound closure strips in non-tension areas
- Absorbable sponge product is a good choice for areas that are difficult to suture

Punch Biopsy Video



Conclusions

- Knowledge of skin anatomy is critical to successful performance of dermatologic procedures and understanding side effects
- When performing cryosurgery tailor length of freeze and number of cycles to “thickness” of target lesion
 - Freeze fast and thaw slowly for best results
- Shave biopsy is best for epidermal and superficial dermal pathology
- Punch biopsy is best when assessment of dermal or deeper pathology is necessary



Common Office Procedures: Joint Injections

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Objectives

- Overview common musculoskeletal procedures
- Discuss indications and contraindications for performing aspirations and injection of joints
- Review therapeutic and diagnostic benefit of such procedures

Points to Review

- Injection/Aspiration
 - Indications for each
 - Relative and absolute contraindications
 - Outpatient setting (routine vs urgent)
- Safety
 - Site identification and consent
 - Infection prevention
 - Prevent injury or tissue damage
 - Patient comfort
- Technique
 - Effective aspiration/injection
 - Keys to success: anatomy

Joint Injection Techniques

- Indications
- Diagnostic
 - Evaluation of synovial fluid
 - Local analgesia
- Therapeutic
 - Improve pain/mobility
 - Adjuvant therapy
- Caution
 - Introduction of infection/worsen bleeding
 - Recurrence

Aspiration Indications

- In setting of injury/trauma, historically:
 - Aspiration to obtain further diagnostic information
 - Hemarthrosis: ligament injury
 - Fat globules: bony injury
- Now essentially a historical use
 - Advances in imaging modalities
 - Avoid risk: injury, infection, or patient discomfort

Aspiration Indications

- Diagnosis of infection or inflammatory arthritis,
 - Gout, RA, Pseudogout, etc.
 - Send aspirate for microbiological or fluid studies
- Management of septic arthritis
 - Serial aspiration
 - Rarely used as part of management strategy
 - Poor surgical candidate
 - May also be used to monitor clinical response
 - Send follow up aspirate for evaluation

Injection Indications

- Pain or inflammation of joint:
 - Osteoarthritis/Degenerative Joint Disease
 - Rheumatoid Arthritis or other inflammatory arthropathy
 - Tendonitis/Tenosynovitis/Bursitis:
 - Use Caution - may result in tendon injury
 - Inject bursa or tendon sheath
 - Rotator cuff tendinopathy/subacromial bursitis
 - Trigger finger, DeQuervain's tenosynovitis
 - Greater Trochanter, pes anersinus, other
 - Enthesopathies
 - Lateral epicondylitis (Tennis elbow)
 - Medial epicondylitis (Golfer's elbow)
 - Achilles or Plantar fasciitis (caution)

Contraindications

- Absolute:
 - Skin infection, contamination, or compromise at injection site
 - May be able to use alternate approach or location
 - Infected joint or bursa?
 - Contraindication for Therapeutic injection
 - Indication for Diagnostic aspiration
 - Presence of Joint Prosthesis
 - Consult Ortho or refer patient back to treating surgeon
 - Patient preference/refusal
 - Drug allergies
 - Acute Fracture

Contraindications

- Relative:
 - Anatomic difficulty
 - Severe scarring
 - Deep structure (intra-articular hip)
 - Excessive soft tissue envelope
 - *Consider image guidance*
- Coagulopathy
 - depending on strength of indication, may be managed proactively
- No/Minimal relief from previous
- Osteoporosis surrounding
- Uncontrolled diabetes mellitus

Complications

- Infection
- Reaction (local)
- Steroid flare
- Soft tissue atrophy
- Hypopigmentation
- Tendon rupture
- Systemic effects
- Direct needle injury

Complications

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Safety

Site Identification and Consent

- Informed consent
 - Review procedure, risks and benefits with patient
 - Document! (may be verbal or written)
- Determine correct site - patient agreement
 - Follow your institutional protocol
 - Each site of procedure should be identified
- Alert patient
 - Verbal confirmation of appropriate site
- Non-participating patient–include representative
 - Mark site according to institutional protocol

Safety

Infection Prevention - Skin Prep

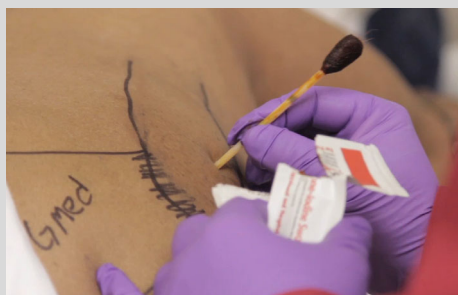


- Decrease contamination/sterilize skin
- Do not place through non-intact skin!
 - Rash, cellulitis, psoriatic plaque, abrasion, etc.
 - May need alternate technique or delay procedure
- Skin Cleanse with antiseptic
 - Alcohol, Povidone-iodine and/or Chlorhexidine

Safety

Infection Prevention - Skin Prep

- Using basic sterile technique to prep:
 - Always wear gloves
 - Scrub field in circular pattern
 - center and moving peripherally
 - Do not touch field with non-sterile object
 - May use sterile alcohol swab to wipe injection site
 - If hair removal needed - snip or use clipper, not razor
- Allow alcohol to dry
 - Drying action hydrolyses bacteria to kill
- Perform procedure immediately to avoid re-contamination



Safety

Infection Prevention - Skin Prep

- Try to make the experience as pleasant as possible
 - Avoid further discomfort or complications
 - Positioning, relaxation, watching, “Needle phobia”
- Use of Analgesics
 - Topical, local
- Accurate, confident injection technique
 - Know your anatomy and equipment
 - Needle and fluid “feel”
 - Difficult to reach target
 - *Consider image guidance*
 - Reassure patient

Safety

Infection Prevention

- Use “no-touch” technique to place needle
 - important to avoid contaminating “field” by touching prepped area with unsterile object, e.g. glove
 - use of sterile gloves or sterile drape is optional
 - may require prepping larger field, and help of assistant
 - may be helpful if you need to palpate area for accuracy
- Cover with sterile dressing following injection
 - Compressive wrap optional

Medication

Corticosteroid

- Efficacy generally accepted but little evidence
- Systemic side effects
 - Short term:
 - Hyperglycemia
 - Persists for variable period following injection
 - Long term:
 - AVN
 - Impaired immunity
 - Adrenal suppression
- Relatively rare with common injection dosing and occasional use

Medication

Corticosteroid

- True Allergy uncommon
 - May include allergy to carrier or other component of formulation
 - Still reported - rarely
- Local effects
 - Increased risk of infection
 - Possible increased risk of future periprosthetic infection
 - Skin hypopigmentation
 - Tendon attrition/tears
 - Actual effect on joint unknown, difficult to pinpoint

Medication

Local Anesthetics

- Lidocaine, ropivacaine, bupivacaine, etc.
- Allergy
- Toxicity
 - High intra-articular concentration linked to chondrotoxicity
 - CNS and Cardiovascular effects
 - Large dose
 - Inadvertent intravascular injection



Aspiration/Injection Technique

General Comments

- Use same size needle for injecting/aspirating same fluid each time
 - consistent “feel” for the flow
- Smaller gauge may produce too much resistance to flow:
 - false feeling of not being in the space with injection attempt
 - may yield a false “dry tap” with aspiration attempt
- Larger gauge: flow may feel “too easy” even if not in joint.
- Needle length: Spinal needle for deep structures
 - Larger gauge due to flexibility and resistance to flow (18 or 20g)

Aspiration/Injection Technique

Setup – Joint Injection Video

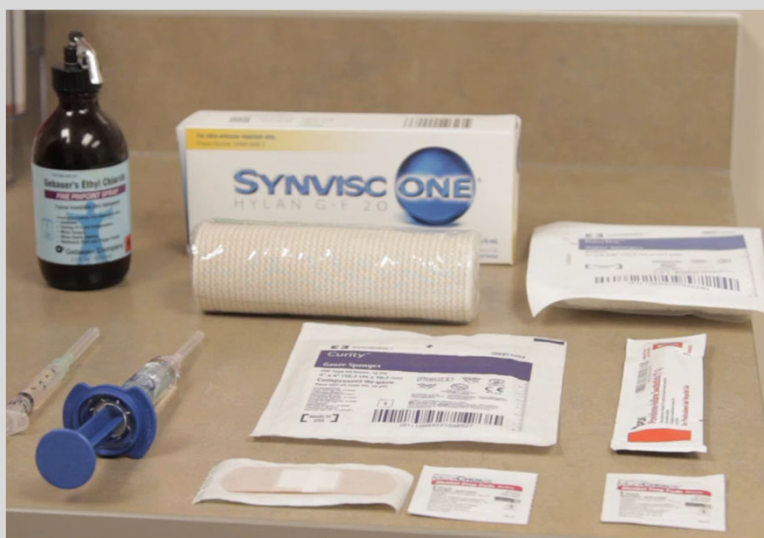
Injection video – Knee anatomy, Skin



Video - Aspiration/Injection Technique

Setup – Joint Injection Video

Instruments



Aspiration/Injection Technique

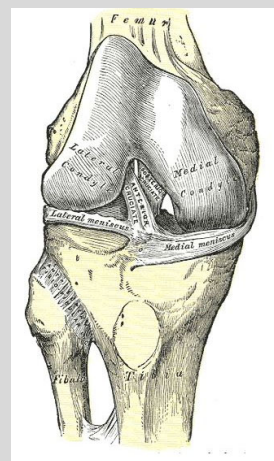
Specific - Knee

- Relevant anatomy
 - Joint capsule extends from just below joint line to above patella, including suprapatellar pouch
 - Fibular head is lateral side, below joint line
 - Extra articular
 - Prepatellar bursa does not communicate with joint normally, suprapatellar bursa does.

Aspiration/Injection Technique

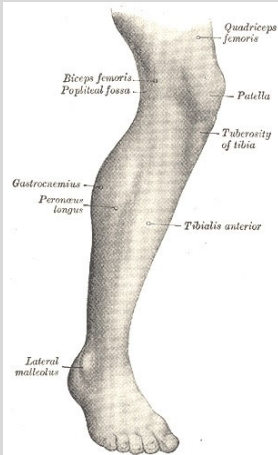
Specific - Knee

- Approach: anterior medial (1)
 - Knee flexed, patient seated
 - Medial femoral condyle
 - Needle aims directly posterior
 - Touch but do not penetrate articular cartilage
- Approach: anterior lateral (2)
 - Knee flexed, patient seated
 - Lateral arthroscopic portal
 - Location corresponds to lateral joint line, just lateral to Patella tendon
 - Aim needle posteromedially to enter femoral notch
 - Fluid should flow freely, otherwise advance slightly and gently apply pressure again
 - Needle may be in prepatellar fat pad



Aspiration/Injection Technique

Specific - Knee



- Approach: lateral suprapatellar
 - Knee extended, patient supine
 - Inject suprapatellar pouch from lateral side
 - Palpate IT band (Posterior) and Quad Tendon (Anterior)
 - Insert needle at level just proximal to superior pole of patella
 - Should feel resistance at capsule, then “Pop” through
 - Needle should be able to pivot proximal and distal under patella/ quad tendon

Video - Aspiration/Injection Technique

Joint Injection Video

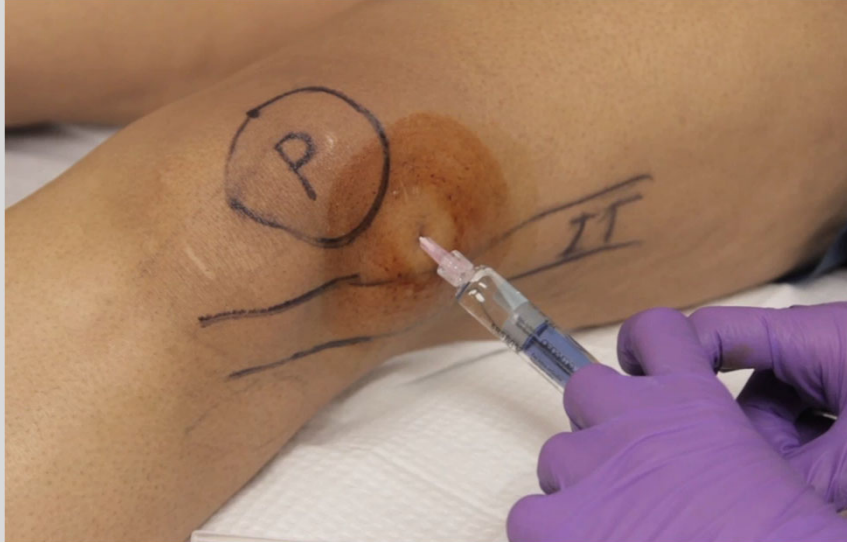
Simulation of Knee Injection with Anatomic Model



Video - Aspiration/Injection Technique

Joint Injection Video

Injection of pre-injected Knee with Viscosupplementation



Aspiration/Injection Technique

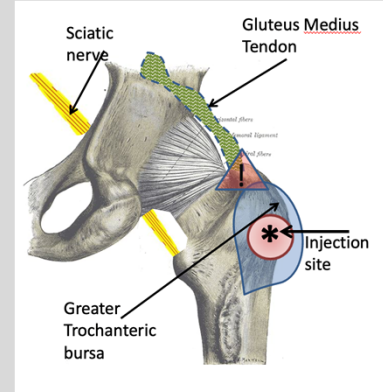
Specific - GT Bursa

- Approaches:
 - Posterolateral “hip”/upper thigh
 - Lateral decubitus with affected side up
 - Can be done with patient standing and leaning over a table
 - Spinal needle sometimes needed for length
 - if large soft tissue envelope

Aspiration/Injection Technique

Specific - GT Bursa

- Indications
 - Trochanteric “bursitis”
 - Maximally painful area of posterolateral trochanter
 - may not correspond to physical fluid sac
 - Differentiate from Gluteus Medius tendon insertion
 - Inject point of maximal tenderness
 - Not G. Medius!
 - Avoid injection of tendon to avoid attritional tear



Aspiration/Injection Technique

GT Bursa Injection Video

Video - Specific technique: Greater Trochanteric Bursa



Aspiration/Injection Technique

Specific - Subacromial Bursa

- Relevant anatomy
 - Subacromial bursa is separate from Glenohumeral joint if rotator cuff is intact
 - Lies between the Acromion and the rotator cuff tendons
- Positioning:
 - Seated upright or supine/beach chari
 - Seated position opens up subacromial space due to gravity on arm
 - Note: If there is full thickness Rotator Cuff tear, medication also reaches the Glenohumeral joint

Aspiration/Injection Technique

Specific - Subacromial Bursa

- Diagnostic and/or therapeutic
- Indications
 - Subdeltoid/subacromial bursitis
 - Rotator cuff impingement
 - Rotator cuff tendinopathy
 - Adhesive capsulitis

Aspiration/Injection Technique

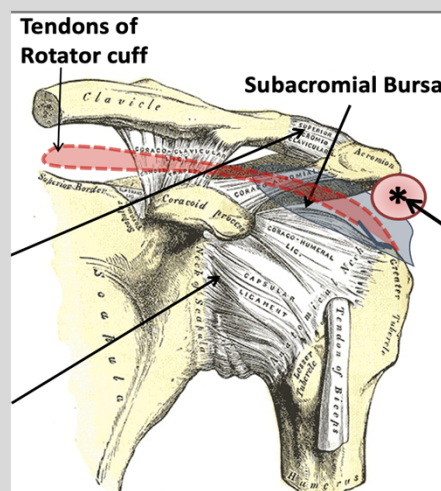
Specific - Subacromial Bursa

- Multiple Shoulder injection targets
 - Subacromial Bursa
 - Most commonly performed
 - Topic of this instruction
 - Acromioclavicular Joint
 - Small joint superior/anterior to GH joint, lateral end of clavicle
 - May be difficult due to osteophytes
 - Glenohumeral Joint
 - (Intra-articular Shoulder)
 - Ultrasound guidance

Aspiration/Injection Technique

Specific - Subacromial Bursa

- Palpate the distal, lateral, and posterior edges of acromion
- As prior with aseptic technique
- Needle is inserted just inferior to posterolateral edge of acromion
- Directed anteromedially



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