

Soft Tissue and Joint Injections

Corticosteroids: Depo-Medrol (methylprednisolone)- 40 mg or 1 mL for large joint (intermediate)
Kenalog (triamcinolone)- 40 mg or 1 mL for large joint (intermediate)
Celestone (betametasone) - 6 mg or 1 mL for large joint (long)- currently unavailable
Decadron (dexamethasone) - 4 mg or .5 mL for large joint (long)
(adjust according to patient size)

Anesthetic: 1% lidocaine or .5% bupivacaine- 2x to 3x amount of steroid

Caution: Not in tendon

Allergic rxn- watch for 30 minutes

Flare- ice 15-20 mins every 2 hours, and NSAIDs

Contraindicate: **allergy to steroid**
Infected joint, superficial skin infection, bacteremia, blood thinner (relative)

Complications:

<u>Local:</u>	Bleeding	<u>Systemic:</u>	Face flushing
	Infection		Impaired glucose tolerance
	Depigmentation		Syncope
	Subcut. Atrophy		Menstrual irreg.
	Pain		Muscle Atrophy
	Post-inj. Flare		Osteoporosis
	Tendon rupture		Adrenal Suppression
	Calcification		Psychologic upset
	Fat atrophy		Acne
	Nerve damage		Allergic reaction

Needles gauge: 18-20 for aspiration
22-25 for injection
25-30 for skin anesthetic

HIP: Greater trochanteric bursitis - lateral recumbent- palpate up femur- max tenderness
- needle to bone, w/d 2-3 mm
- 1 ml of Dep,Ken,Cel or .5 ml Dec + 2 ml bup/lid

Hip Joint Proper -very difficult, experience needed, often requires fluoroscopy

KNEE: Joint - superior med or lat position- 1 cm sup and 1 cm med/lat to patella
- flexed- lateral to patella tendon- .5-1 cm above tibial plateau
- 2 ml of Dep,Ken,Cel or 1ml Dec + 3-4 ml bup/lid

Pes anserine bursa - follow adductor muscle group to tibia- max tender
- needle to bone- w/d 2-3 mm
- 1ml Dep,Ken,Cel or .5 Dec + 2 ml bup/lid

ANKLE: Joint - anterior to med malleolus and lateral to ant tibialis tendon
- palpate talus/tibia articulation
- 1ml Dep,Ken,Cel or .5 Dec + 2 ml bup/lid

1st MTP - palpate joint line- dorsolateral or dorsomedial approach
- shallow joint
- .5ml Dep,Ken,Cel or .25 Dec + 1 ml bup/lid

Plantar Fascia - Caution for rupture or atrophy
- NOT through sole/fat pad- medial approach
- 1ml Dep,Ken,Cel or .5 Dec + 2 ml lid

SHOULDER: Glenohumeral - posterior- 2-3 cm below angle of spine, aim for coracoid
- 1.5 ml Dep,Ken,Cel or .75 Dec + 3 ml bup/lid

Acromioclavicular - palpate out on clavicle, slight depression at site
- .25ml Dep,Ken,Cel + .5 ml bup/lid

Biceps tendon - Caution for tendon rupture (easy flow only)
- + Speeds test
- insert at max tender- 30 degree angle to bicep tendon
- .25ml Dep,Ken,Cel + .5 ml bup/lid

Subacromial - subdeltoid bursitis- tender lateral to acromian
- impingement- overhead activities- + Neers and/or +Hawkins
- anterior lat approach- for subdelt bursitis
- post-lat approach- 1-2 cm below post-lat edge- aim to coracoid
- 2 ml of Dep,Ken,Cel or 1ml Dec + 3-4 ml bup/lid

ELBOW: Joint - triangle of olecranon, radial head, and lat epicondyle
- aim to medial epicondyle
- 1ml Dep,Ken,Cel or .5 Dec + 2 ml bup/lid

Lateral epicondyle - elbow at 45 degrees and hand in pronation
- max tenderness- to bone- w/d 1-2 mm
- can do peppering

- Olecranon Bursa
 - 1ml Dep,Ken,Cel or .5 Dec + 2 ml bup/lid
 - aspirate fluid with large bore needle (Cx)
 - r/o infection before injecting with steroids
 - wrap tightly and NSAIDs
 - 1ml Dep,Ken,Cel or .5 Dec + 2 ml bup/lid
 - often returns
- HAND:** Carpel tunnel
 - distal crease and ulnar to palmaris longis
 - ulnar to midline w/o palmaris longis
 - 30 degrees toward middle finger
 - 1ml Dep,Ken,Cel or .5 Dec + 2 ml lid
- DeQuervain's
 - + Finklestein test
 - distal to radius styloid- peritendon: NOT in tendon
 - 1ml Dep,Ken,Cel or .5 Dec + 2 ml bup/lid
- Trigger Finger
 - identify the flexor tendon involved
 - distal palmer crease
 - peritendonously, syringe will move with finger flexion
 - 1ml Dep,Ken,Cel or .5 Dec + 2 ml bup/lid
- Ganglion Cyst:**
 - 18-gauge needle needed for aspiration
 - thick gelatinous fluid
 - hold needle in place with hemostat, remove syringe and replace with steroid containing syringe
 - .5ml Dep,Ken,Cel or .25 Dec + 1-2 ml bup/lid
 - often returns

Quick References

Residency Inpatient web site: Has videos of many joint injections.

Pfenninger JL, Fowler G., ed. *Pfenninger and Fowler's Procedures for Primary Care, 2nd Ed.*, 2080 pages, Mosby

Joint and Soft Tissue Injection. AAFP, July 15, 2002: vol 66, num 2

Knee Joint Aspiration and Injection. AAFP, Oct. 15, 2002: vol 66, num 8

Diagnostic and Therapeutic Injection of the Wrist and Hand Region. AAFP, Feb 15, 2003: vol 67, num 4

Diagnostic and Therapeutic Injection of the Elbow Region. AAFP, Dec 1, 2002: vol 66, num 11

Diagnostic and Therapeutic Injection of the Shoulder Region. AAFP, March 15, 2003: vol 67, num 6

Diagnostic and Therapeutic Injection of the Ankle and Foot Region. AAFP, Oct 1, 2003: vol 68, num 7

Diagnostic and Therapeutic Injection of the Hip and Knee Region. AAFP, May 15, 2003: vol 67, num 10

Basics of Joint Injection. Postgraduate Medicine Online, January 2001, vol 109, num 1

fpnotebook.com, ortho procedures

Steroid Dosing and Equivalents

<i>Steroid</i>	<i>Common concentration (mg per mL)</i>	<i>Common equivalent dose* (mg)</i>	<i>Approximate duration of action (days)</i>
Methylprednisolone acetate (Depo-Medrol)	40 or 80	40	8
Triamcinolone acetonide (Kenalog)	10 or 40	40	14
Triamcinolone hexa-cetonide (Aristospan)	20	40	21
Dexamethasone acetate (Decadron-LA†)	8	8	8
Dexamethasone sodium (Decadron†, Solurex†)	4	8	6

NOTE: Steroid agents listed in order of prevalence of use.

*-Dose equivalent to 40 mg of methylprednisolone acetate or triamcinolone acetonide (the most commonly used intra-articular steroid; see Table 6^o).

†-Brand no longer available in the United States.

Joint Specific Injections (Proximal to Distal)

<i>Joint</i>	<i>Steroid dose* (mg)</i>	<i>Anesthetic dose† (mL)</i>	<i>Needle length (inch)</i>	<i>Needle gauge</i>
Shoulder	20 to 40	5	1.5	21
Elbow	20	3	1.0	23
Wrist	20 to 40	3	0.5 to 1.5	23 or 25
Knee	20 to 80	5	1.5	21
Ankle	20 to 40	3 to 5	1.0 to 1.5	23

*-Dosing for methylprednisolone acetate (Depo-Medrol).

†-Dosing for 1% lidocaine (Xylocaine).

Information from reference 45.

Table 7. Local Anesthetics for Joint Injection

<i>Medication</i>	<i>Onset of action (minutes)</i>	<i>Duration of action (hours)</i>	<i>Max volume of injection*</i>
0.25% Bupivacaine (Marcaine)	30	8	60 mL
0.5% Bupivacaine	30	8	30 mL
1% lidocaine (Xylocaine)	1 to 2	1	20 mL
2% lidocaine	1 to 2	1	10 mL

*-Increased risk of cardiac toxicity or arrhythmia above these dosages.

Tables from: Stephens MD, Beutler AI, and O'Connor FG. Musculoskeletal injections: a review of the evidence. AFP 78(8) 2008.