

TABLE 192-2 Common Corticosteroids and Recommended Dosages for Various Joint Injections

Corticosteroid	Concentration (mg/mL)	Large Joint* Dosage (mg)	Medium Joint [†] Dosage (mg)	Small Joint ^{††} Dosage (mg)	Ganglia (mg)	Tendon Sheath (mg)	Bursa (mg)
Hydrocortisone acetate	25, 50	40-100	20-40	8-20	20-40	20-50	40-90
Prednisolone tebutate (Hydeltra-TBA)	20	20-30	10-20	8-10	10-20	4-10	20
Prednisolone sodium phosphate	20	10-20	5-10	4-5	5-10	3-8	20
Triamcinolone hexacetonide (Aristospan)	5, 20	20-30	10-20	8-10	10-20	4-10	20
Triamcinolone diacetate (Aristocrat)	25, 40	20-40	10-20	8-10	10-20	4-10	20
Triamcinolone acetonide (Kenalog)	10, 40	20-40	10-20	8-10	10-20	4-10	20
Methylprednisolone acetate (Depo-Medrol)	20, 40, 80	20-40	10-40	8-10	4-20	4-10	20
Dexamethasone sodium phosphate (Decadron)	4	2-4	1-3	0.8-1	1-2	0.4-1	2-3
Dexamethasone acetate (Decadron-LA)	8	2-4	1-3	0.8-1	1-2	0.4-1	2-3
Betamethasone acetate/phosphate (Celestine Soluspan)	6	6-12	3-6	1.5-3	1-3	1.5-2	3-6

*Such as knee, shoulder, ankle.

[†]Such as elbow, wrist.^{††}Such as metacarpophalangeal, interphalangeal, acromioclavicular, temporomandibular.

TABLE 192-5 Needle Size and Drug Dosage for Injection Therapy

Anatomic Structure	Needle Gauge (Length)	Dose of 1% Lidocaine (mL)	Dose of Methylprednisolone Acetate (mg)
Abductor tendon of thumb (de Quervain's disease)	25 (1½ inch)	3-4	10-20
Acromioclavicular joint	22-25 (1-1½ inch)	2-4	4-10
Ankle	22 (1-1½ inch)	3-5	20-40
Anserine bursa	22-25 (1½ inch)	3-5	20-40
Biceps tendon	22 (1½ inch)	5-10	10-20
Calcaneal bursa	22 (1½ inch)	5	20-40
Carpal tunnel	25 (1½ inch)	1	20-40
Elbow	25 (1½ inch)	3-4	10-20
Radiohumeral joint	22 (1-1½ inch)	3-5	20-30
Lateral or medial epicondyle ("tennis elbow," "golfer's elbow")	22-25 (1-1½ inch)	3-5	10-30
Olecranon bursa	22 (1-1½ inch)	2-3	10-20
Finger and toe joints (interphalangeal)	25 (1 inch)	0.5-1.0	4-10
Flexor tendon sheath (trigger finger)	25 (1 inch)	0.25-0.5	4-10
Ganglion of wrist, other	18-20 (1-1½ inch)	0.25-0.5	4-10
Hip joint	20 (2½-3 inch)	5	40-80
Knee intra-articular space	20 (1½ inch)	5	20-80
Plantar fascia	22 (1½ inch)	2-4	15-30
Prepatellar bursa	20-22 (1-1½ inch)	3	20-40
Shoulder intra-articular space	20 (1½ inch)	5-7	20-40
Shoulder rotator cuff tendon	18-20 (1½ inch)	5	20-40
Shoulder subacromial bursa	22 (1½-2 inch)	5-7	30-40
Shoulder subacromial bursa	25 (½-1 inch)	1-2	10-20
Tarsal tunnel	25 (½-1 inch)	1-2	5-20
Temporomandibular joint	25 (1½ inch)	3-5	10-30
Trigger point	25 (1½ inch)	5-10	20-40
Trochanteric bursa	22 (1½-2 inch)	2-4	20-40
Wrist joint	22-25 (1-1½ inch)		

Modified from Pfenninger JL: Injections of joints and soft tissue. Part II. Guidelines for specific joints. Am Fam Physician 44:1690, 1991.

Conditions Improved with Local Corticosteroid Injection

Adapted from Pfenninger JL: Injections of joints and soft tissue. Part I. General guidelines. Am Fam Physician 44:1196, 1991.

Articular Conditions

1. Coccydynia
2. Crystal-induced arthritis
 1. Gout
 2. Pseudogout
3. Ganglions
4. Osteoarthritis
5. Rheumatoid arthritis
6. Seronegative spondyloarthropathies
 1. Ankylosing spondylitis
 2. Arthritis associated with inflammatory bowel disease
 3. Psoriasis
 4. Reiter's syndrome

Nonarticular Conditions

1. Bursitis
 1. Anserine
 2. Olecranon
 3. Prepatellar
 4. Subacromial
 5. Trochanteric
2. Costochondritis
3. Fibrositis
 1. Localized (trigger points)
 2. Systemic
4. Morton's neuroma
5. Neuritis
 1. Carpal tunnel syndrome
 2. Cubital tunnel syndrome
 3. Tarsal tunnel syndrome
6. Periarthritis
 1. Adhesive capsulitis
7. Tenosynovitis/tendonitis
 1. Bicipital tendonitis
 2. de Quervain's disease
 3. Golfer's elbow (medial epicondylitis)
 4. Impingement syndrome
 5. Plantar fasciitis
 6. Rotator cuff
 7. Supraspinatus tendonitis
 8. Tennis elbow (lateral epicondylitis)
 9. Trigger finger
8. Tietze's syndrome

Indications for Hyaluronic Acid Supplementation

Synovial fluid functions as a lubricant and a shock absorber in the joint. In OA, it retains very little of these intrinsic physical properties. At a critical load, normal synovial fluid changes its mechanical properties from viscous lubricant to elastic shock absorber. This change occurs between walking and running and is determined by the dynamic stress of both the frequency and the force of the load—a property which is diminished in OA. In addition, the concentration of hyaluronan in the synovial fluid in patients with OA is less than normal. Injected hylans and hyaluronans have properties similar to normal synovial fluid, and although they may only remain in the knee less than 2 weeks, the beneficial effects can persist up to a year (mean duration of 8.2 months). There is some evidence that they stimulate endogenous production of the synovial fluid. There is no evidence that viscosupplementation retards the progression of joint deterioration, but a recent Cochrane Review concluded that viscosupplementation showed beneficial effects on pain and patient function; this modality shows promise of postponing for years the need for total knee replacement. Studies are ongoing to assess its efficacy in other joints, because it is currently only Food and Drug Administration (FDA)–approved for use in the knee. The materials injected (hylans and hyaluronans) are pharmacologically inert so the FDA classifies them as “devices,” not “drugs.”

1. •Approved for use in knee only
2. •May be used instead of, or after, intra-articular corticosteroid injections and before surgical intervention
3. •Effective in all stages of OA of the knee, although it wanes in the most advanced stages
4. •Is being studied for use in other joints

Contraindications

1. •Cellulitis or broken skin over the intended entry site for the injection or aspiration
2. •Anticoagulant therapy that is not well controlled
3. •Severe primary coagulopathy
4. •Infected effusion of a bursa or a periarticular structure (for injection)
5. •More than three previous injections in a weight-bearing joint in the preceding 12-month period (*relative*—concern for theoretic joint destruction)
6. •Lack of response to two or three prior injections (*relative*)
7. •Suspected bacteremia (Unless the joint itself is suspected as the source of the bacteremia, it should not be tapped. Doing so could inoculate the joint space and *cause* infection.)
8. •Unstable joints (for steroid injection)
9. •Inaccessible joints (For many primary care physicians, this includes the hip joint, the sacroiliac joint, and the joints of the vertebral column.)
10. •Joint prostheses (If infection is suspected, consider a referral to the orthopedist that placed the prosthesis, if possible.)
11. •Pregnancy (*relative*)

TABLE 192-1 Relative Potency of Corticosteroids

Adapted from Leversee JH: Aspiration of joints and soft tissue injections. Prim Care 13:572, 1986.

Corticosteroid	Relative Anti-inflammatory Potency	Approximate Equivalent Dose (mg)
Short-acting Preparations		
Cortisone	0.8	25
Hydrocortisone	1	20
Intermediate-acting Preparations		
Prednisone	3.5	5
Prednisolone tebutate (Hydeltra-TBA)	4	5
Triamcinolone (Aristocort, Aristospan, Kenalog)	5	4
Methylprednisolone acetate (Depo-Medrol)	5	4
Long-acting Preparations		
Dexamethasone (Decadron-LA)	25	0.6
Betamethasone (Celestone Soluspan)	25	0.6