

# Musculoskeletal corticosteroid use:

*Types, Indications, Contraindications, Equivalent doses, Frequency of use and Adverse effects.*

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# Corticosteroid Use

- **Reduce inflammation, alleviate pain and restore function.**
- **Management of degenerative diseases, inflammatory diseases and post-traumatic soft tissue injury.**
- **Administered safely into joint space, peri-articular soft tissues, bursa and tendon sheaths.**

# Disclosure

- **Dr Jide Olubaniyi – No disclosure**
- **Dr Sean Crowther – No disclosure**
- **Dr Sukhvinder Dhillon – Speaker,  
Ankylosis Spondylitis workshop, AbbVie.**

## Mechanism of Action

Binds onto intracellular glucocorticoid receptor



Receptor-ligand complex translocates into cell nucleus and binds onto target genes



Upregulation of Annexin-1



Inhibition of prostaglandin and leukotrienes production



Reduction of synovial blood flow and leucocyte accumulation



**Reduction of inflammation and pain**

# Classification

- **Soluble**

- Dissolve freely in water
- Non-particulate (clear)
- Non-esters
- Quick onset of action
- Shorter duration of action

- Dexamethasone
- Betamethasone

- **Insoluble**

- Require hydrolysis by cellular esterases
- Particulate
- Contain esters
- Longer onset of action
- Longer duration of action

- Triamcinolone
- Methylprednisolone

Methylprednisolone acetate

medrol) **FDA-approved types**

Methylprednisolone sodium succinate

(Solu-

Medrol)

Triamcinolone acetonide

(Kenalog)

Triamcinolone hexacetonide

(Aristospan)

Triamcinolone diacetate

(Aristocort

Forte)

Betamethasone sodium phosphate/acetate

(Celestone

Soluspan)

Dexamethasone sodium phosphate

(Hexadrol)

# Potency



\* Relative to hydrocortisone

# Half-life

## Short

(8-12 hours)

Hydrocortisone

## Intermediate

(12-36 hours)

Triamcinolone

Methylprednisolone

## Long

(36-72 hours)

Betamethasone

Dexamethasone



# Equivalent dose

<b>Corticosteroid</b>	<b>Dose (mg) *</b>
<b>Methylprednisolone acetate (Depo-medrol)</b>	<b>40</b>
<b>Triamcinolone acetonide (Kenalog)</b>	<b>40</b>
<b>Dexamethasone acetate</b>	<b>8</b>
<b>Betamethasone sodium phosphate/acetate</b>	<b>8</b>
<b>Hydrocortisone acetate</b>	<b>200</b>

*\* Equivalent dose to 40mg methylprednisolone acetate or triamcinolone acetonide, the most commonly used intra-articular corticosteroids.*

## Dose\*

	Small	Medium	Large
Methylprednisolone Acetate (mg)	4-10	10-40	20-80
Triamcinolone Acetonide (mg)	2.5-5.0	5-15	5-15
Betamethasone (ml)	0.25-0.5	0.5-1.0	1-2
Hydrocortisone Acetate (mg)	10-25	-	25-50
Dexamethasone Acetate 4-16mg (based on joint size)			

\* [www.drug.com](http://www.drug.com)

*Large (Shoulder, Knee). Medium (Elbow, Wrist). Small (Acromioclavicular, Facet).*

# Indications

## Inflammatory arthritides

Rheumatoid arthritis

Crystal-induced arthritis (gout, pseudogout)

Spondyloarthropathies

**Non-inflammatory arthritides:** Osteoarthritis

## Peri-articular/soft-tissue inflammatory conditions

Bursitis

Synovitis/Tenosynovitis

Adhesive capsulitis

Epicondylitis

Nerve entrapment syndromes

## Others

Ganglion cyst

Trigger finger

Neuroma

# Contraindications

## •Absolute

Infection (systemic/local)  
Corticosteroid allergy  
Intra-articular fracture  
Unstable joint

## •Relative

Coagulopathy

Indwelling prosthesis  
Uncontrolled diabetes mellitus  
Severe juxta-articular osteoporosis  
Recent intra-articular injection (< 6 weeks)  
Multiple intra-articular injections (max. of 3-4 injections per year\*)

*\* Controversial due to concerns of soft tissue/chondrocyte injury.*

# Adverse effects

- **Septic arthritis (0.01-0.03%)**

Most feared complication

Usually due to staphylococcus aureus

- **Post-injection flare (2-25%)**

Commonest adverse effect

Develops within hours post-injection, Can last up to 3 days

Presumed due to crystal-induced synovitis

- **Facial flushing (15%)**

Develops 2-30hours post-injection

Can last up to 36 hours

Usually self-limiting

# Adverse effects

- **Skin atrophy (8%)**

Develops 1-4 months post-injection

Usually normalizes over 1-2 years

- **Skin depigmentation (5%)**

Develops 2 months post-injection  
normalizes in 12 months

Usually

- **Hyperglycemia**

2-5 days post-injection  
diabetics

Caution in

# Adverse effects

- **Tendon rupture (<1%)**

Due to intra-tendinous injection  
cases of Achilles and patellar tendon rupture

Reported

- **Systemic effects**

Avoid surgery, dehydration or severe stress within 2 weeks  
post-injection

- **Brain/spinal cord infarction**

Reported following cervical transforaminal injections

Paraplegia reported following lumbar transforaminal  
injections

Particulate corticosteroid are implicated

Non-particulate corticosteroid (e.g dexamethasone) advised

# Bibliography

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