# Joint Injection Workshop

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# Joint injections

- Indications
- Type of steroid and why
- Technique
- Complications
- Consent – verbal, written
- Imaging?

# Indications for aspirating or injecting joints/soft tissues

| Reasons for joint aspirations |
| --- |
| Exclude infection (mandatory) |
| Diagnostic e.g crystals, inflammation |

| Reasons for injections |
| --- |
| Diagnostic – eg. LA |
| Therapeutic (relieve symptoms) Joints, tendon sheaths, bursa, CTS |

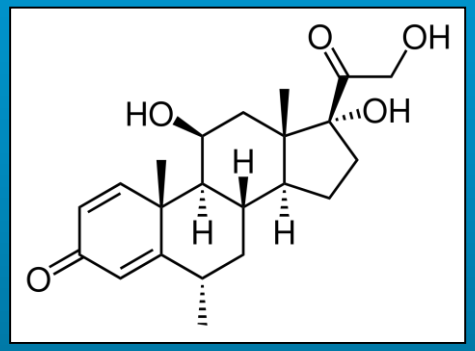
# What to inject?
# Type of steroid

- Duration in joint?
- Risk of fat necrosis/atrophy and skin pigmentation
- Dose?

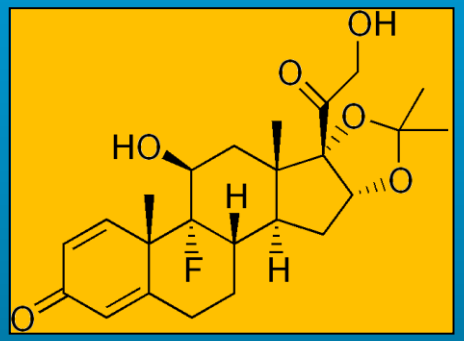
# Duration in joint - solubility

| Corticosteroid | Solubility | Cost |
|---|---|---|
| Betamethasone sodium phosphate | Most soluble | |
| Dexamethasone sodium phosphate | Soluble | |
| Prednisone sodium phosphate | Soluble | |
| **Methylprednisolone acetate** | **Slightly soluble** | **$4.72 (40mg/vial)** |
| **Betamethasone sodium phosphate + Bethamethasone acetate** | **Slightly soluble** | **$5.34 (2.96/2.71mg/vial)** |
| Triamcinolone diacetate | Slightly soluble | |
| Prednisolone tebutate | Slightly soluble | |
| **Trimancinolone acetonide** | **Relatively insoluble** | **$27.25 (10mg/vial) $81.39 (40mg/vial)** |
| Triamcinolone hexacetonide | Relatively insoluble | |
| **Hydrocortisone acetate** | **Relatively insoluble** | |
| Dexamethasone acetate | Relatively insoluble | |

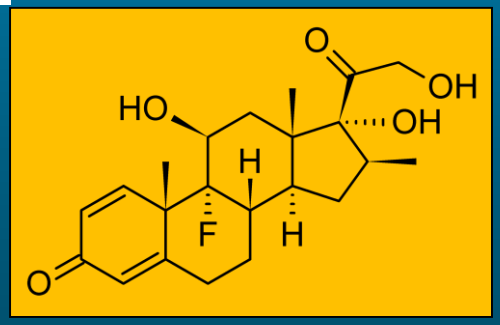
# Fluorinated vs non-fluorinated steroids




Methylprednisolone acetate




Triamcinolone acetonide




Betamethasone

# Fluorinated steroids risk in s/c injections – fat necrosis, hypopigmentation

| Corticosteroid | Fluorinated |
|---|---|
| Betamethasone sodium phosphate | Yes |
| Betamethasone sodium phosphoate/Betamethasone acetate | Yes |
| Dexamethasone sodium phosphate | Yes |
| Triamcinolone diacetate | Yes |
| Trimancinolone acetonide | Yes |
| Triamcinolone hexacetonide | Yes |
| Dexamethasone acetate | Yes |
| Prednisone sodium phosphate | No |
| **Methylprednisolone acetate** | **No** |
| Prednisolone tebutate | No |
| **Hydrocortisone acetate** | **No** |

# Dose – how many vials?

| | Methylprednisolone acetate | Triamcinolone acetonide | Hydrocortisone acetate |
|---|---|---|---|
| **Available doses** | 40mg/ml<br>(1, 2, 3ml vials) | 40mg/ml<br>Or 10mg/ml | 25mg/ml<br>(1ml vials) |
| **Doses**<br>**Large joint – eg. knee** | 80mg (2 vials) | 80mg (2 vials) | Soft tissue injections |
| **Medium or small joint e.g. elbow, wrist, shoulder** | 40mg (1 vial) | 40mg (1 vial) | |

# Complications of steroids injections

| Complication | Incidence |
|---|---|
| Infection | 1 in 15000 injections |
| Tendon rupture | <1% |
| Post injection flare | 5% |
| Facial flushing | 40% |
| Skin atrophy/fat necrosis | <1% |
| Skin hypopigmentation | <1% |
| Steroid arthropathy | 0.8% |
| Vasovagal reaction | 10-20% |
| Systemic absorption | rare |
| Nerve damage (eg. Median nerve) | rare |
| Hyperglycemia in diabetics | 2hrs – 5 days |

# Contraindications for injections – when not to inject….

- Infection of the overlying skin or subcutaneous tissues or if bacteremia suspected or known
- Significant bleeding disorder or anticoagulation or severe thrombocytopenia
- Prosthetic joints

# How much is too much?

- 3-4 per year
  - Consider overall dosage of steroids in one year
- Cole et al 2005 for OA knee
  - Repeated use every 3 months for 2 yrs showed no change in joint space narrowing
- McAlindon et al 2017 JAMA Boston
  - 2 year RCT 40mg Triamcinilone acetonide every 3mo
  - 70 pts in each group
  - MRI more cartilage loss (-0.11mm (-0.20-0.03)) in steroid group
  - No difference in pain
- Zeng et al 2019 (OAI)
  - Worsening JSW – HR 2.93 (148 pts)

# Aftercare

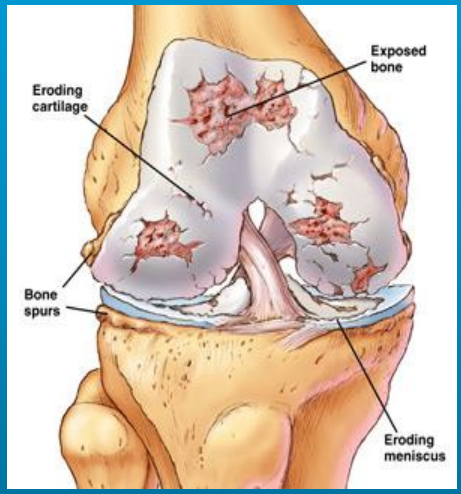
- Rest the injected area for 24-48hrs after a therapeutic injection

# Consent?

- Verbal or written?

# Osteoarthritis – Cochrane review 2015 Juni et al

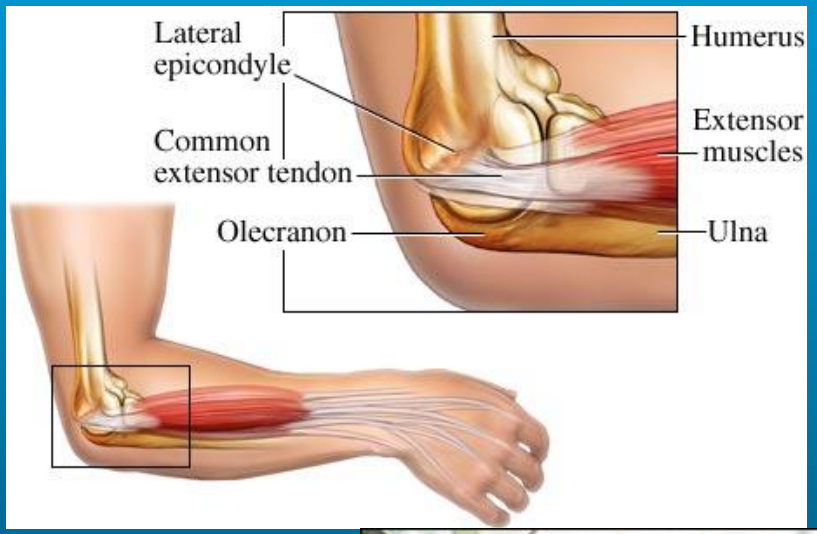
| | Trials (n=27 trials) |
|---|---|
| Pain reduction | NNT 8 (6-13)<br>1.0cm on VAS<br>Moderate 1-2wks<br>Small to moderate 4-6wks<br>Small 13wks<br>Nil 26wks |
| Functional improvement | NNT 10 (7-33)<br>Small to moderate 1-2wks<br>Small to moderate 4-6wks<br>Nil 13wks or 26wks |
| QOL | Nil effect |
| Joint space narrowing | Nil effect |

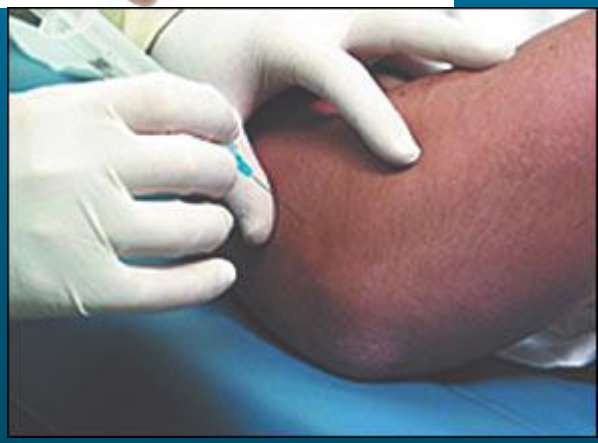


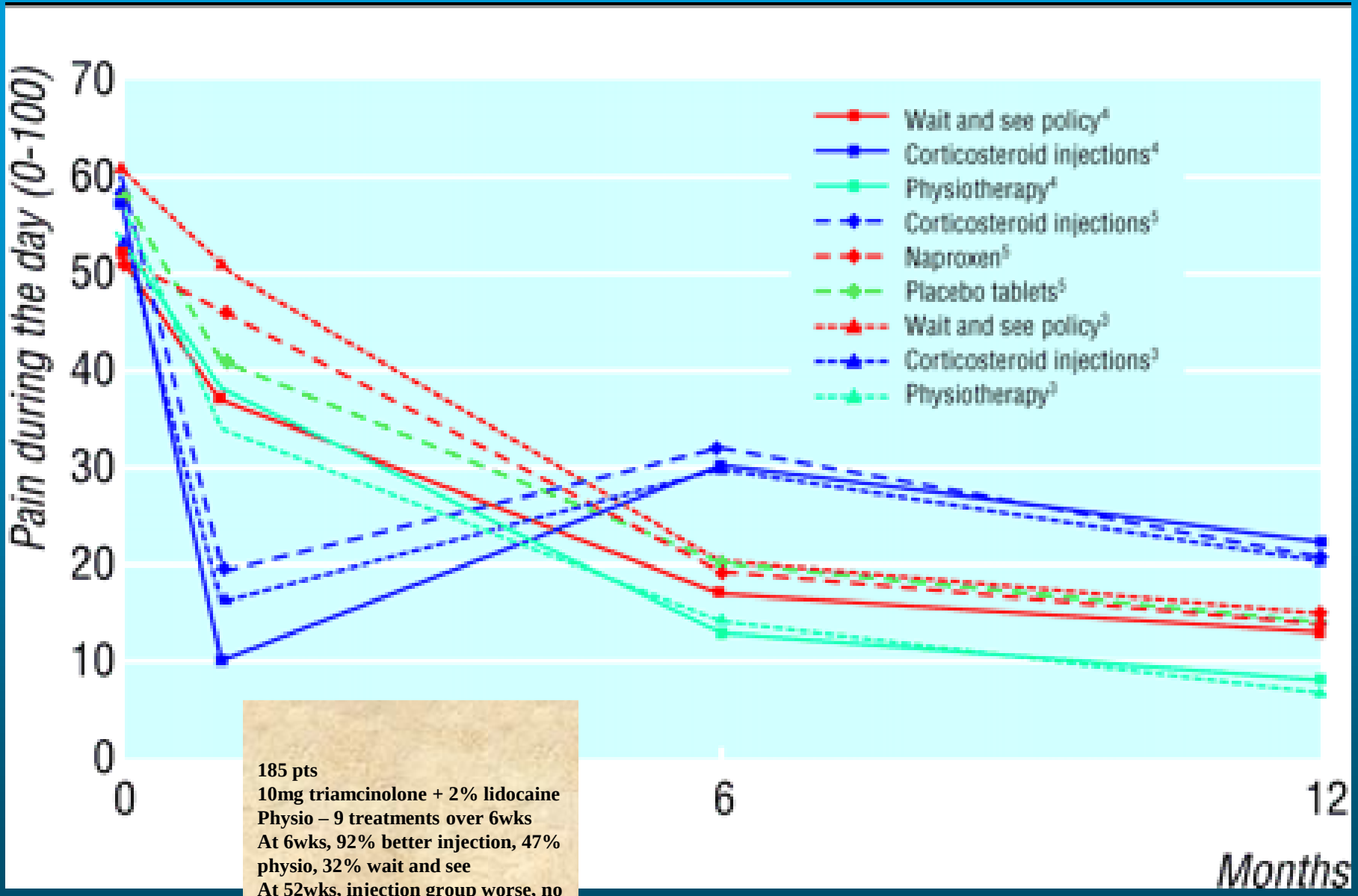

**Large heterogeneity between trials**
**Quality of trials?**
**Small study effects**
**Low methodological quality**
**A single trial with minimal bias did not find any benefit of injections**
**Slightly less SE with IA steroids (NS)**
**Quality of evidence = LOW**

# Tennis elbow

| Agent | Trials |
|---|---|
| Corticosteroids | 10 |
| Botulinum | 4 |
| Autologous blood | 3 |
| Platelet rich plasma | 2 |
| Prolotherapy | 1 |
| Hyaluronic acid | 1 |
| Glycosaminoglycan | 1 |
| Polidoconal | 1 |






**185 pts**
**10mg triamcinolone + 2% lidocaine**
**Physio – 9 treatments over 6wks**
**At 6wks, 92% better injection, 47% physio, 32% wait and see**
**At 52wks, injection group worse, no difference in other 2 groups**

Smidt et al, Lancet 2002

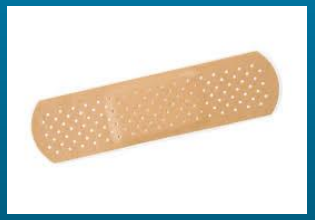
# Tennis elbow

- Bisset et al 2006 - UQ
  - 198 pts
  - 3 similar groups as Smidt 2002
  - 6wks – 78% better with injection vs 27% wait and see, 65% physio
  - 52wks – physio better outcomes vs injection
  - AE – loss of skin pigment, atrophy of SQ tissue
- Coomes et al 2013
  - 165 pts
  - Injection vs placebo vs injection + physio vs physio only
  - 4wks – injection or physio alone improved
  - 26 and 52wks – injection not as good, no difference with or without physio
  - AE – loss of skin pigment, atrophy

# Equipment

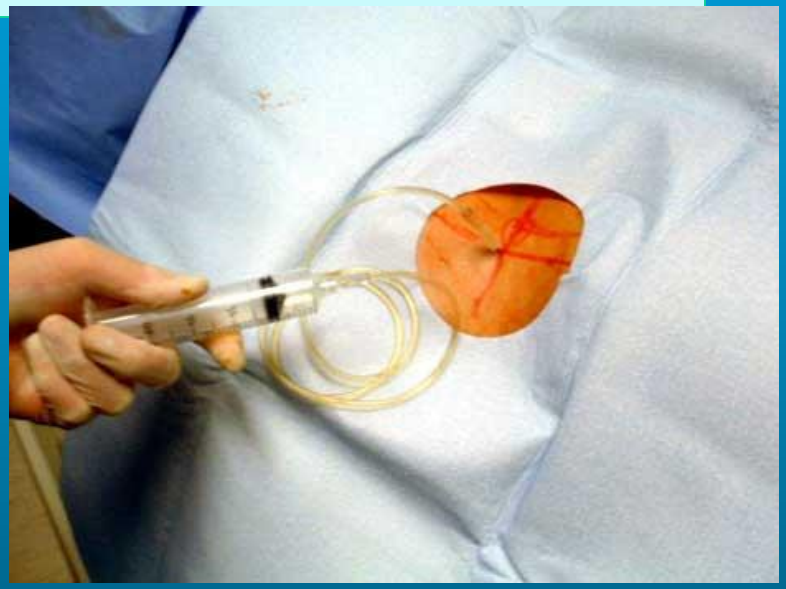
- Blue (23G) or Green (21G) needle
- 5 or 10ml syringe
- 2 Skin cleaning wipes
- Sticking plaster
- If injecting CS – draw up in syringe CS and LA

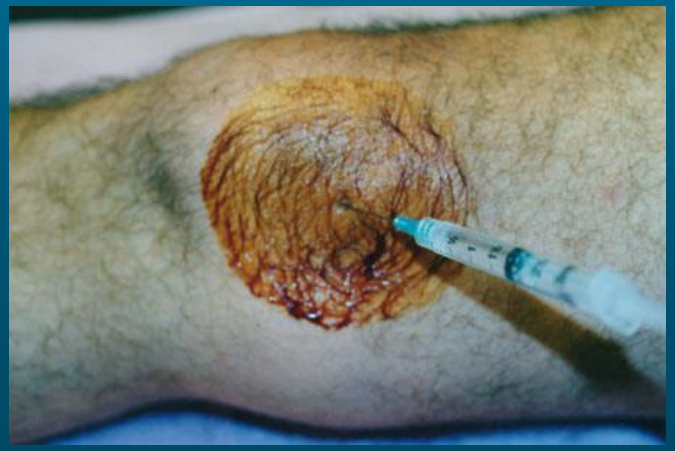





# Technique

1. No Touch Technique





# Technique

1. Get all equipment ready before
2. Palpate location of where to inject eg. Medial side of knee
3. Use Alcohol wipes to clean area
4. Use second alcohol wipe to palpate location again