

# Considered Judgement Form

This form is a checklist of issues that may be considered by the Purchasing Guidance Advisory Group when making purchasing recommendations



<b>Meeting Date</b>	<b>21 June 2017</b>
<b>Topic</b>	<b>Effectiveness of Knee Injection of Steroid with or without Local Anaesthetic</b>

## Purpose

This purchasing guidance (considered judgement) document accompanies a systematic review commissioned by ACC Research from the International Centre for Allied Health Evidence (iCAHE, University of South Australia)<sup>1</sup>. The purposes of this review are to:

1. What is the evidence for the effectiveness of steroid injections into the knee with or without local anaesthetic in relieving pain and/or in improving functional outcomes in patients with knee pain?
2. What is the evidence for the safety of steroid injections into the knee with or without local anaesthetic?

## Background

Knee pain can originate from a number of pathologies including patellofemoral syndrome, patella tendinopathy, bursitis, tendonitis, ligament injuries and osteoarthritis (OA). For individuals >55 years knee pain is most often attributed to OA; <55 years it can be due to a larger range of causes including patellofemoral joint pain a more commonly identified cause in the younger population<sup>1</sup>.

It should be noted that OA in the knee can be:

- *Primary*: Considered “wear and tear” OA that usually develops after 50 years of age; or
- *Secondary*: OA with a specific cause such as injury, or due to the effects of obesity, genetics, inactivity or other diseases.

Management of knee pain can diverse and include non-pharmacological and/or pharmacological measures. Non-pharmacological measures may be exercise, weight loss and specific strengthening exercises. Pharmacological treatment can include: steroidal or non-steroidal drugs; analgesics; injection; surgeries like knee reconstructions or replacements; or visco-supplementation (hyaluronic acid) or corticosteroid injection<sup>1</sup>.

This work is to update ACC’s 2005 guidance on IPM procedures which made the following recommendation for clinical practice:

- *Injection of steroid is recommended in the short term (up to two weeks) for the treatment of adults with osteoarthritic knee pain (grade A recommendation - supported by good quality evidence)*

<sup>1</sup> iCAHE, 2017. The effectiveness of Knee Injection of Steroid with or without Local Anaesthetic: Systematic Review of the Literature. *International Centre for Allied Health Evidence, University of South Australia, Adelaide in collaboration with ACC Research.*

## 1. Effectiveness, Volume of Evidence, Applicability / Generalisability and Consistency / Clinical impact

*Comment here on the extent to which the service/product/ procedure achieves the desired outcomes. Specific reference needs to be made to safety. Report number needed to treat and harm where possible, any issues concerning the quantity of evidence and its methodological quality and the extent to which the evidence is directly applicable or generalisable to the New Zealand population, and the degree of consistency demonstrated by the available evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence. Comment on the clinical impact e.g. size of population, magnitude of effect, relative benefit over other management options, resource implications, balance of risk and benefit.*

### Volume and quality of studies:

The authors identified 13 systematic reviews (SRs) and 18 randomised controlled trials (RCTs). The quality of studies is outlined from the table taken from the review (Page 14):

	Total	High quality	Adequate quality	Low quality	Rejected
<b>Systematic reviews</b>	<b>13</b>	3	3	7	3
<b>RCTs</b>	<b>18</b>	8	3	7	0

This review subdivided the studies into the two most common major clinical representations for knee pain in the literature; these were OA and patellofemoral pain syndrome. OA may arise from traumatic injury (secondary) and/or degenerative changes (primary); the majority of studies did not differentiate between the two types of OA, no studies specifically reported from cohorts of secondary OA.

There was some overlap in the studies included within the SRs (see Appendix 4, page 53 of the iCAHE Review). The SRs included a total of 54 RCTs, with 22 of these published from 2005 onwards. As the objectives of was different only eight RCTs were referenced more than six times across the 13 included SRs indicating that the data presented came from a wide range of sources, however it should be noted that all of the most frequently referenced RCTs were published before 2005. *This means that a large proportion of the primary data presented from the SRs is likely to have already been included within the 2005 ACC IPM guidance.*

## **Osteoarthritis**

### Systematic Reviews

Primary and secondary OA were included in all reviews and not separated for analysis.

- **Evidence of effectiveness**

Eleven SRs reported on the effectiveness of steroid injections for a short-term (up to 4 week in the majority of the reviews) and long-term (defined as more than 4 weeks in some reviews, 12 or 26 weeks, or 3 to 6 months depending on how studies followed up their participants). All the SR found that corticosteroid injections were effective for the short-term and were not effective for the long-term. These studies varied from low quality evidence to high quality evidence.

- **Sonographic guidance**

One low quality SR (Maricar, 2012) compared sonographically guided injections with blind injections. They found that there was a greater decrease in pain from baseline at two weeks from injections performed with sonographic guidance compared against those that were not.

Randomised Controlled Trials

Eighteen RCTs were included for analysis, four of these included primary OA only and the rest included both secondary and primary in their cohorts. Steroids were assessed using different parameters and comparators as outlined below:

- **Steroid compared to baseline**

Five RCTs of low to high quality compared the effect of steroid at a series of time points after it had been delivered (baseline). A range of doses of steroid were used against a range of different types of corticosteroid between the different studies. Overall these studies showed steroids may be effective in OA for up to 12 weeks (low to high quality evidence) which might decrease after 6 weeks (one low quality study), and there could be some increase in function for up to 8 weeks.

- **Dosage parameters**

Dosages of FX006 (10, 40 and 60mg of extended release triamcinolone acetonide) were compared against immediate release triamcinolone acetonide in one RCT. 40mg FX006 showed greatest improvement over other dosages, and greater improvements than 40mg immediate release triamcinolone acetonide.

80mg methylprednisolone with 2mg morphine showed no statistically significant difference in pain reduction or knee range of motion

- **Steroid compared to hyaluronic acid**

Five RCTS were compared to hyaluronic acid for short term and long term pain relief. Although there were differences in the dosage and corticosteroid agent all these studies showed that steroids were equal or more effective than HA in the short term. Two studies showed that after 6 weeks HA may have greater efficacy on pain reduction.

- **Steroids compared to NSAIDs**

Two RCTs (1 high and 1 low quality) both showed that NSAIDs and corticosteroid decreased VAS pain scores from baseline at two weeks, there was no significant difference between the two treatments. The high quality RCT showed that the corticosteroid may be more effective at providing functional improvement.

- **Steroid compared to other interventions**

In one low quality study radiofrequency neurotomy of the genicular nerve was shown to significantly reduce pain in the long term as well as short term, whereas corticosteroid only for the short-term.

- **Steroid as an adjunct to therapy**

Two high quality RCTs compared steroids against a placebo with exercise. Steroid and exercise had greater hamstring isometric strength; however both RCTs showed that there was no difference in pain reduction in OA knees in the groups that had a corticosteroid delivered alongside a 12 week exercise programme compared to an exercise programme alone using the KOOS (Knee injury and osteoarthritis outcome score) pain scale.

One other RCT compared steroid injection with steroid injection and joint lavage (high quality) to find that pain was reduced with steroid injection with or without lavage.

- **Steroid – Technique used**

One low quality RCT showed that there was less pain with sonographically guided injections compared to palpation guided injections.

No difference was seen in superolateral, anteromedial or anterolateral approaches. Both periarticular and intra-articular approaches decreased pain however peri-articular injections caused more pain 24 – 48 hours after the initial procedure.

### **Patellafemoral pain syndrome**

One SR published in 2004 included an old study (Darracott, 1973) that showed that there was limited evidence that Nandrolone is effective.

One RCT of adequate quality compared cortisone injections to eccentric and heavy slow repetition exercises. It reported that all three modalities reduced pain with similar responses, at two weeks exercise was able to maintain their efficacy and gradually reduced pain, whereas the steroid injection had a diminishing effect.

### **Safety and Risk**

Minor complications are associated with steroid injections, but these are not uncommon and rarely require significant medical attention. However there was no significant difference in adverse reactions between steroids and placebo or agent. Minor complications may include arthralgia, joint stiffness, joint swelling, joint effusion, joint warmth, joint crepitation, and injection site pain.

## **2. Cost**

*Where possible and reported in the published research literature any economic analysis of the new treatment is considered. Where possible the following will be considered; total costs of the new intervention and number of claimants likely to be affected are considered, along with comparison with the cost of current treatments or interventions, actuarial assessment of the impact of the intervention on scheme liability (including direct and indirect impact e.g. other services and access), expected “accrued benefit” in terms of quality of life, longer life or speedier return to the workforce, implications of cost to the wider health sector.*

Evidence that steroids had higher functional improvement but higher costs (triamcinolone injection) than NSAIDs (ketorolac) in a study on knee OA in the US (Bellamy et al, 2016). Triamcinolone US\$12.28 per injection compared to Ketorolac at US\$2.01 led to an overall saving of US\$12,601 over 3 years in the institution study conducted in.

Sonographic guidance shown to significantly reduce the cost per patient by 13% (US\$17) relative to palpation method, and reduce cost per responder by 58% (US\$224) due to the longer therapeutic duration resulting in fewer injections per year.

#### **ACC – Analysis (performed 13 June 2017)**

From 2013 – 2016 a total of 59 procedures were charged to the IN30/31 codes with knee as the primary injury site at a total cost of \$3,903.48 for three years.

The average cost of the procedure done without imaging was \$67 only one procedure was reported as done under sonographic guidance in 2013 which cost \$413 for the individual claim.

## **3. Equity**

*The extent to which the intervention reduces disparities in health status - in particular equity of access and health outcome. The extent to which the intervention supports the objectives of the Maori access strategy and will encourage access to assessment, treatment and rehabilitation services for those groups where there is evidence of that access is problematic.*

No issues of equity were associated with injections

#### 4. Consistency with the intent of the AC Act

*Purchasing decisions made by ACC must be consistent with and reflect consideration of factors described in the AC Act [Schedule 1, clause 2 (1 and 2)] and these decisions must be defensible against this statutory requirement in respect of individual claimants.*

#### 5. Possible purchasing options

The options are:

1. Purchase,
2. Do not purchase, or
3. Purchase on a case by case basis on the decision of the Manger Corporate Clinical Advice (or equivalent).

#### 6. Evidence statements

*Summarise the advisory group's synthesis of evidence relating to this service, product or procedure, taking the above factors into account, and indicate the evidence level that applies.*

##### **Knee Osteoarthritis**

The evidence base ranges from high to low quality across the SRs and the RCTs. The primary articles from SRs are predominantly published prior to 2005 so the information reported from SRs is likely to have already been covered in the original IPM guidance.

The data published across all the RCTs and SRs is consistent across all the studies regarding effectiveness of corticosteroid injections across different steroid agents and dosages. This means that the recommendations regarding short and long term effectiveness for reducing pain have a Level A grade of recommendation (see page 13 of iCAHE, 2017).

Moderate evidence from a lower number of studies of varying quality were found regarding the use of slow release steroid and the benefit of exercise programmes alone with OA leading to a Level B grade of recommendation.

Less evidence is available regarding the use of sonographic guided injections (Level D recommendation).

##### **Patellafemoral tendinopathy**

Due the lower volume and quality of evidence available (one high quality SR, and one adequate quality RCT) recommendations have been given a Level C recommendation.

##### **Safety and adverse events**

Evidence was consistent across a range of high quality and low quality studies that minor complications with intra-articular steroid injections are relatively common but rarely require significant medical attention. Level A recommendation.

## 7. Purchasing recommendations

What recommendation(s) does the advisory group draw from this evidence?

The findings from this review are in alignment with the original 2005 IPM guidance. With the increase in volume of evidence that is now available the purchasing recommendations could be more detailed to reflect the evidence that has now been published regarding knee corticosteroid injections.

Recommendations that have derived directly from the evidence are:

### **Corticosteroid Injections for Secondary Knee Osteoarthritis**

***For short-term pain relief (relief that lasts up to 4 weeks)***

**Do Purchase:**

- Corticosteroid injection procedures for the knee

**Alternatives to consider on a case-by-case basis for long-term pain relief:**

- Injection low release corticosteroid agents
- Long duration knee-specific exercise programmes that may include heavy slow repetitions and/or eccentric exercises

### **Corticosteroid Injections for Patellafemoral tendinopathy**

***Short-term pain relief (relief that lasting up to 4 weeks)***

**Consider on a case-by-case basis:**

- Corticosteroid injection procedures for the knee

**Do purchase**: Exercise programs for short-term and long-term pain relief from tendinopathy that includes eccentric exercises and heavy slow repetitions

These recommendations were ratified by the Clinical Governance Committee in July 2017.