

Intra-articular knee injections (IAKIs) are a common, safe, and effective frontline treatment in orthopaedics.

On rare occasions, some patients may experience temporary discomfort and swelling after the procedure for 24 to 48 hours. Whilst the injection medium may cause some of these symptoms after the procedure, it is vital that the procedure itself does not add to the chances of feeling discomfort as well as ensuring delivery to the correct tissues. Significant research and review has been conducted to find the most efficacious injection sites and techniques.

- It has been reported that one third of knee injections are delivered extra-articularly.¹
- In a systematic review, blinded IAKI's were reasonably accurate, with lateral injection sites and practitioner experience improving outcomes.^{2,3}
- The use of ultrasound guidance improved accuracy significantly in all sites.⁴
- Medial injections with a partially flexed knee were deemed the least successful, more painful, and most likely to be loculated. However, accuracy was no different to the lateral side.

Superolateral Patellar (SLP)

Most studied. Successful when guided (95%), most successful when blind (89%)⁶

Superomedial Patellar (SMP)

Least studied, with 1 study showing 100% accuracy when guided and 93% blind⁶

Lateral Midpatellar (LMP)

2nd most accurate when blind (84%)

Medial Midpatellar (MMP)

Least accurate both blind and guided (64% blind and 86% with guidance)

Anterolateral Joint Line (ALJL)

70% accurate when blind⁷

Anteromedial Joint Line (AMJL)

73% accurate when blind (no studies with guidance)⁵

Injection Site	Benefits	Drawbacks
Superolateral Patellar	Easier when there is an effusion. Most access to the synovium to bathe in HA. Highest pooled accuracy rate at 91%. ³	May be painful if needle collides with superior pole of patella.
Superomedial Patellar	Least studied but showed a 93% IA accuracy. ⁶ Good position for aspiration of suprapatellar bursa.	May damage patella chondral cartilage.
Lateral Midpatellar	Accuracy (dependent on severity of OA) varies from 76% ⁵ to 93% ¹	May be painful for patient. Narrower patella-femoral cleft and joint capsule is tougher laterally than medially. <50% IA delivery of fluid as higher incidence of fluid infiltration into soft tissues here. ⁶
Medial Midpatellar	May allow easier access with OA knee.	Been shown to be the least accurate approach. ⁵ Difficulty due to engagement of medial plica or fat pad. May be painful for patient.
Anterolateral Joint Line	May be useful when knee cannot extend (fixed flexion or OA).	May be difficult to aspirate from. Good technique needed to avoid anterior menisci and transverse patellar ligaments. The ALJL injection was only 70% accurate when administered blind, suggesting guidance would be advantageous at this site. ²
Anteromedial Joint Line	Little pain for patient.	May be difficult to aspirate effusion. Good technique needed to avoid anterior menisci and transverse patellar ligaments.

Tips for Intra-articular knee injections (IAKIs) with Anika Viscosupplements

General guidelines

- Full aseptic technique is required despite infections being very rare.
- Ultrasound-guided injections are not always required for the knee. However, evidence suggests that in less experienced hands, placement is more accurate with an ultrasound.
- Both clinician and patient must be comfortable and the approach to the joint should be easy.
- When possible, the needle should be held in the dominant hand.
- Chondrotoxicity, thought to be due to interference of normal chondrocyte metabolism, is a known exposure time- and dose-dependent effect of most local anaesthetic agents that may be further potentiated by concomitant corticosteroid administration.⁸ Due to this we would advise against using local anaesthetic when using Cingal.

The mnemonic KNEAS can help you remember the injection process

Know

your plan and explain it to the patient. Know your landmarks on the patient's knee and mark them out if needed and then clean the area with an alcohol wipe or betadine. Be aware of the choice of needle used for aspiration and administration of the HA. We would recommend a 21 gauge needle for Cingal and Monovisc™ to optimise fluid dynamics.

Needle

insertion into your chosen point and ensure you have the correct direction being aware of anatomy as well as feel of the tissues as you pass through the capsule. Often the capsule gives a little resistance as you pass through it and the patient may experience this. If administering local anaesthetic, now is the time for that as you pass through the tissues. Then remove the needle and give the allotted time for it to take effect. However, this is more than likely not needed, often prolonging the patient's anxiety as well as creating more needle passes.

Extract

any excess aspirate and draw the excess fluid off the joint prior to injection. This ensures less volume is left in the knee

after the injection, reducing tightness in the knee. It also allows you to assess the aspirate to check for blood or signs of infection. If either are present, do not inject any substance into the knee.

Administer

the Anika HA product of choice. Do this in a controlled and slow manner remembering that Cingal is a little more viscous so press down evenly onto the ergonomic plunger. Total administration should take between 5 and 10 seconds. If there too much resistance when pushing the plunger, ensure the needle is not in the fat pad or extracapsular. Reorienting the needle a little often helps as well as rotating the bevel. Reassurance of correct needle placement can be found by aspirating a little again.

Set

expectations with the patient. Explain that they may experience some discomfort or fullness in the knee for 24-48 hours after the procedure and that they should take it relatively easy over the next 24 hours. Ice and paracetamol or ibuprofen will help reduce any feelings of discomfort. If the patient experiences any pain after 48 hours, they must report to their practitioner so infection can be ruled out.

1. Jackson DW, Evans NA, Thomas BM. Accuracy of needle placement into the intra-articular space of the knee. *J Bone Joint Surg Am.* 2002;84:1522-1527. 2. Maricar et al; Seminars in Arthritis and Rheumatism, Vol 43, Issue 2, Oct 2013: Where and how to inject the knee – A systematic review. 3. Hermans et al; Seminars in Arthritis and Rheumatism, Vol 41, Issue 2, Oct 2011: The most accurate approach for intra-articular needle placement in the knee joint: A systematic review. 4. Fang et al; *Atrhosc Sports Med Rehab*, 2021, Aug: US guided knee injection are more accurate than blind injections: A systematic review of RCT's. 5. Esenyel C, Demirhan M, Esenyel M, et al. Comparison of four different intra-articular injection sites in the knee: a cadaver study. *Knee Surg Sports Traumatol Arthrosc.* 2007;15:573-577. 6. Wind WM, Jr, Smolinski R.J. Reliability of common knee injection sites with low-volume injections. *J Arthroplasty.* 2004;19:858-861. 7. Jayaram P, Kennedy DJ, Yeh P, Dragoo J chondrotoxic effects of local anesthetics on human knee articular cartilage: a systematic review *PM R.* 2019;11:379. doi: 10.1002/pmrj.12007

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