Injections for Knee Osteoarthritis

Associate Professor Justin Roe

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

Osteoarthritis (OA) is a progressive degeneration of the cartilage surfaces inside the knee. This results in pain and inflammation of the joint that may flare-up acutely. The goal of any injection is to reduce the pain and symptoms associated with osteoarthritis to help restore function. Injections do not re-grow or heal the cartilage, or reverse the clock on the degenerative process. Injections may be considered as an option in the treatment of osteoarthritis.

COMMONLY ASKED QUESTIONS

What can I expect when I come for my injection?

When you come to your appointment for your injection, you will have a short discussion with Dr Roe to check in on your symptoms and to clarify any questions you may have. Dr Roe will need to examine your knee. You will be positioned on the examination table with your entire knee exposed, up to your thigh. Your knee will then be cleaned with antiseptic solution before introducing a small needle to inject the medicine. This is unlikely to be painful. Local anaesthetic is used in conjunction with the injection to help numb the area. This often stings initially when being injected. If you have a lot of fluid inside your joint, Dr Roe may aspirate (take out) some of the fluid prior to the injection to help the medicine work.

What are the potential risks of knee injections?

- Infection is extremely rare, but possible. The risk infection will be reduced by sterile administration of the injection.
- An injection may not achieve the desired result that one wished for despite the time and cost. This is sometimes regarded as a risk.
- An adverse reaction to an injected medication, regardless of the injection type, is very uncommon but possible. Potential reactions are redness, heat, swelling, rash, hives, itching and flushing.
- It is important to discuss with Dr Roe if you have any allergies or diabetes.

When can I return to my regular activities?

You are permitted to walk and drive immediate after the injection. You should take 24-48h off from other strenuous physical activity (exercise or a physical job).

TYPES OF KNEE INJECTIONS

There are several types of injections that can be administered to the knee, discussed below.

Corticosteroid (or Cortisone)

How it works?

Osteoarthritis causes inflammation inside the affected joint. Corticosteroids are strong anti-inflammatory medicines. When taken by mouth, steroids can have a number of side effects. The delivery of the medication directly into the joint has minimal effect on the rest of the body. Most studies show that steroid is effective for moderate pain reduction when compared to a placebo injection.[1]

How long will it last?

The strongest effect will be for 2-6 weeks after the injection.[1] Some patients report up to 6 months relief.

Is there any downside?

Some studies have shown that with chronic, repeated injections (ie an injection every 3 months for two years or more), cartilage volume may decrease with no significant lasting pain relief.[2]

Hyaluronic acid (HA)

How it works?

Hyaluronic acid is a substance that exists naturally in joint fluid of the knee.[3] The concentration and molecule size of hyaluronic acid decreases in OA. This results in a lower viscosity (thickness) of knee joint fluid, thereby decreasing the shock absorbing ability of the fluid. HA injection is thought to temporarily increase the thickness of the joint fluid, while also providing anti-inflammatory and pain-relief properties.[4]

How long will it last?

Studies suggest that an HA injection reaches its peak benefit by 8 weeks, and that effects continue up to 6 months[5] or potentially longer.[6]

Is there any downside?

Adverse reactions are rare, and the drug has been well studied with strict monitoring for side effects. According to reported trials, patients have reported arthralgias (joint pains), headache, injection site tenderness, mild joint swelling after the injection. The cost is the other downside. HA injections are around 3 time more expensive than cortisone.

Hyaluronic acid + corticosteroid

How it works?

A combination of mechanisms discussed above: ie anti-inflammatory and increased knee joint fluid viscosity.

How long will it last?

By combining the two medications, the idea is to decrease the lag time that can be seen with HA injections and thus offer relief anywhere from 2-52 weeks post injection.[6]

Is there any downside?

HA + corticosteroid injections are similar in price to HA alone, but around 3 time more expensive than cortisone. The risks of adverse reactions of each component is discussed above.

Platelet rich plasma (PRP)

PRP is an autologous (your own) blood product that contains inflammatory mediators and growth factors. It is thought that these substances can alter biological processes implicated in OA. Many studies have investigated the effects of PRP compared to placebo (saline) or other injections for the management of symptoms relating to OA and have not found PRP to be of any significant benefit.[7] There is limited evidence to support its use in treating symptoms caused by knee OA. Dr Roe does not offer PRP due to the limited evidence, and the cost involved.

Stem cells (bone marrow or adipose/fat derived)

These injections are marketed as having cellular and tissue regeneration properties. The literature around their use is variable in terms of preparations, outcomes measurements, and results.[8] There is not enough high-quality evidence to suggest that these expensive injections are superior to placebo or other injection.[8] Dr Roe does not offer stem cell injections and does NOT recommend anyone use them for the treatment of OA due to the limited evidence and the cost involved.

References

1. Jüni P, Hari R, Rutjes AWS, et al. Intra-articular corticosteroid for knee osteoarthritis. *Cochrane Database of Systematic Reviews*. 2015;2015(10).
2. McAlindon TE, LaValley MP, Harvey WF, et al. Effect of intra-articular triamcinolone vs saline on knee cartilage volume and pain in patients with knee osteoarthritis a randomized clinical trial. *JAMA*. 2017;317(19):1967-1975.
3. Lo G, Lavalley M, Mcalindon T, Felson D. Intra-articular Hyaluronic Acid in Treatment of Knee Osteoarthritis A Meta-analysis. *JAMA*. 2003;290(23):3115-3121.
4. Walker K, Basehore BM, Goyal A, Zito PM. Hyaluronic Acid. In: *StatPearls [Internet]*; 2023.
5. Bannuru RR, Natov NS, Dasi UR, Schmid CH, McAlindon TE. Therapeutic trajectory following intra-articular hyaluronic acid injection in knee osteoarthritis - meta-analysis. *Osteoarthritis Cartilage*. 2011;19(6):611-619.
6. Smith C, Patel R, Vannabouathong C, et al. Combined intra-articular injection of corticosteroid and hyaluronic acid reduces pain compared to hyaluronic acid alone in the treatment of knee osteoarthritis. *Knee Surgery, Sports Traumatology, Arthroscopy*. 2019;27(6):1974-1983.
7. Bennell KL, Paterson KL, Metcalf BR, et al. Effect of Intra-Articular Platelet-Rich Plasma vs Placebo Injection on Pain and Medial Tibial Cartilage Volume in Patients with Knee Osteoarthritis: The RESTORE Randomized Clinical Trial. *JAMA - Journal of the American Medical Association*. 2021;326(20):2021-2030.
8. Delanois RE, Sax OC, Chen Z, Cohen JM, Callahan DM, Mont MA. Biologic Therapies for the Treatment of Knee Osteoarthritis: An Updated Systematic Review. *Journal of Arthroplasty*. 2022;37(12):2480-2506.