
Information about platelet rich plasma (PRP) injections.



Until recently, the evidence for new injection techniques was not compelling. However, more and more evidence is pointing to the newer techniques being as good, if not better, than steroid injections.

As such, we have now invested in equipment to allow us to perform injections based on the patient's own blood (platelet rich plasma or PRP injections). Stem cell therapy (derived from bone marrow) is still a much more painful and experimental procedure and something we are still watching with interest.

These are much safer for patients with diabetes, as there is no steroid to affect blood sugar levels, and rather than suppressing inflammation (leading to less pain initially but a poorer healing response long term), they appear to be better at promoting a healing response. They are also much safer than major surgery in those patients with significant risk factors.

Unfortunately, due to previous practice by less-than-scrupulous agents, these injections are no longer covered by Medicare (and therefore insurers) so there is an out-of-pocket expense. We have however had some success with both Work Cover Queensland and DVA to cover the costs. Ultimately, if you are not covered, we sadly cannot perform these injections without cost, but we do believe our costs reflect our commitment to regional practice.

Of course, no treatment is guaranteed, and if the injections fail then further options are always available for discussion.

With this in mind, any patient who has undergone these injections without success, who then has surgery recommended, will have the cost of the injections offset against any gap fee for surgery.

The following is an information pack about what the injections are, what they are used for, how they are performed, and what to expect during the procedure and process.

Background – What is PRP/platelet rich plasma?

PRP has been used since about 1987 to help promote healing in dental, orthopaedic, and plastic surgery procedures. Over about the past 5 years, PRP has been increasingly recognized for its potential in treating both chronic and acute musculoskeletal injuries involving tendons, ligaments, and joints.

Blood is made of red blood cells, white blood cells, plasma, and platelets. Platelets were initially known to be responsible for blood clotting. However, they are now known to release growth factors which promote the healing processes¹. The basic idea behind a PRP injection is to deliver high concentrations of growth factors to an area of injury, with the hope of stimulating a healing response and eventually reducing inflammation in the tissue.

PRP is derived from your own blood by taking a sample of blood from a vein, placing it in a special tube, and spinning the blood in a centrifuge for about 15 min. This separates whole blood into its components including red blood cells, platelets, and plasma (the non-cellular fluid in blood). The middle layer constitutes PRP, which contains highly concentrated platelets, the cells that normally promote blood clotting. To some extent, injection of whole blood will stimulate the same response, but to a lesser degree.

I've heard there are different kinds of PRP injections?

There is some debate in the evidence surrounding the use of these injections as to what formulation or concentration works the best. There appears to be relatively consistent evidence that using injection with a low white cell count (leukocyte poor) seems to have less side effects and be more effective than those with a high white cell count (leukocyte rich). Concentrating the platelets to 3x their usual amount seems to offer the best results for stimulating healing.

If the injection is used immediately, rather than stored for later use, then there is no need to use a blood thinner to ensure that the platelets remain inactive during storage. Once the blood has been drawn, and the platelets and plasma isolated, the platelets are naturally activated as they would be in any trauma. As such, activating agents have not yet been shown to give a more beneficial result.

The injection that we use fulfils all these criteria.

Is PRP right for me?

If you have a tendon or ligament injury which has failed to respond to traditional conservative treatments, then PRP therapy may help. The procedure is certainly safer, less aggressive, and usually less expensive than surgery. It should aid tissue healing with minimal or no scarring and alleviates further degeneration of the tissues.

This treatment can be used in elite athletes, provided a Declaration of Use is submitted by the athlete.

¹ These include platelet derived growth factor, transforming growth factor beta, and vascular endothelial growth factor. These factors interact with the local cells and send signals that initiate a variety of events such as cell division and migration.

What are the tendons and ligaments?

Tendons connect muscles to the bone, making it possible for you to do many every day physical activities.

Overuse or damage to the tendon over a long period of time causes the fibres in the tendons to form small tears, a condition called tendinosis. Damage to tendons most often occurs in the knee, ankle, shoulder, wrist, biceps, calf and Achilles tendons.

Ligaments are composed of fibres that hold one bone to another, stabilising the range of motion in a joint. When a ligament is damaged, it is no longer able to provide support, which weakens the joint.

Tendons and ligaments have poor blood supply. Combined with the stress of day-to-day activities, they do not easily heal from damage.

How does this differ from a steroid injection?

Studies have shown that steroid injections may actually weaken tissue.

Whilst they may provide a quick fix for temporary pain relief and lessening of inflammation, they can potentially produce a tissue weakening effect. Consequently, they do not generally provide long- term healing.

Conditions with evidence supporting treatment with PRP Injections include:

Plantar fasciitis – an inflammation of the tissue along the sole of the foot.

Patella tendinosis – inflammation & tearing of the ligament between the patella (kneecap) & the tibia (shin bone).

Tennis elbow - (or lateral epicondylitis) is a cause of pain on the outer side of the arm, just below the elbow. Repeated bending and twisting movements of the forearm lead to inflammation in the combined forearm muscle tendon of the extensors (lifting the wrist and fingers back) as it gets close to the bone at the elbow. This can happen as a result of playing tennis, using a screwdriver, wringing wet clothes or carrying buckets. The strains, initially painless, cause small tears in the tendon. As they start to heal, more tears occur and painful inflamed scar tissue forms. As the scar tissue is weaker, it is more prone to tearing again, leading to a repeating cycle of strains, tears and subsequent scarring. It is often therefore very appropriately described as a “repetitive strain injury”.

Golfer’s elbow - as per tennis elbow, but on the inner aspect of the arm.

Knee arthritis – wear and tear in the knee joint, sometimes as a result of trauma.

Hip arthritis – wear and tear of the hip joint, sometimes as a result of trauma.

Shoulder bursitis – there is some evidence that this can be effective although no more so than steroid injections. We therefore recommend a trial of steroid first, and if that is not effective, then PRP can be considered.

There is **little to no evidence** to currently encourage the use of PRP in the following conditions and it is therefore not offered in this practice for these.

Achilles tendinosis – inflammation and micro tears with scarring of the Achilles tendon

Rotator cuff tears - tears with inflammation and scarring of the tendons attaching the small muscles around the shoulder which usually act as stabilisers of the shoulder joint.

Risks

As with all procedures, there is a risk of some complications. These are rare, but you should be aware of them before your operation. They include:

- Infection at the site of the injection.
- An increase in inflammation and pain at the site of the injection.
- Bleeding and/or bruising.
- No relief or worsening of symptoms.
- Skin discolouration.
- Allergic reaction to the local anaesthetic drug.
- Failure to achieve successful result.
- Injury to the nerves or blood vessels.
- Prolonged stiffness and or pain.

Before the procedure...

Drink plenty of fluids in the day before and on the day of the injection. You do not need to be nil by mouth for this procedure. Having plenty of fluids on board can make it easier to take the blood needed.

Do **not** take any **anti-inflammatory drugs**/medicines/supplements for around 2 weeks before and after the PRP procedure. Anti-inflammatories will directly counteract PRP's intended effects.

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) include, but are not limited to, the following examples: Aspirin, Ibuprofen (Nurofen/Brufen), Naproxen/Naprosyn, Celecoxib (Celebrex), Meloxicam (Mobic), Diclofenac (Voltaren), Indomethacin.

Note: paracetamol/panadol is **not** an anti-inflammatory and can still be used.

Corticosteroids (e.g. prednisone) must not be taken for 2 - 3 weeks before the procedure. If you had a cortisone injection in the same area recently, it is advised that you wait at least one month, ideally 3 months, before having a PRP injection

If you are on a blood-thinning medication ("Anticoagulant", such as warfarin/Coumadin, enoxaparin/Clexane, dabigatran/Pradaxa, rivaroxaban/ Xarelto, apixaban/ Eliquis etc), please ensure that we are made aware of this. Depending on the site, the injections can sometimes still be given, but this will need to be discussed before any consent is given. Aspirin and fish oil do not need to be stopped.

After the procedure...

Immediately after the procedure you will be asked to take a seat for 5-10 minutes to ensure that there are no immediate adverse reactions.

The affected area can often become more painful after the injection as the purpose of the injection is to promote inflammation and a healing response. As such, if the injection is given in a lower limb, it may well be too painful to bear weight, leading to crutches or a walking aid being required for 2-3 days. Ice packs can be invaluable in this period, and we usually recommend having 2 or 3 in the freezer so that they can be recycled as required.

Most evidence suggests that vigorous activity is avoided for 10-14 days after an injection or course of injections, at which point a graduated physiotherapy programme can be started. This will be undertaken with referred to physiotherapy provider, in conjunction with your treating doctor.

As the inflammation settles, the healing response improves, but this can take 8-12 weeks to knee demonstrate an effect. This improvement can continue for up to 6-9 months in the case of arthritis.

How many injections will I need, and how often?

Based on current available best practice, the following is likely to be recommended. All these however will be tailored to meet your individual needs.

Plantar fasciitis – single injection, with a second recommended after 4 weeks if no or partial improvement only

Patella tendinosis – single injection, with a second recommended after 4 weeks if no or partial improvement only

Tennis elbow – single injection, with a second recommended after 4 weeks if no or partial improvement only

Golfer's elbow - as per tennis elbow, but on the inner aspect of the arm.

Knee arthritis – course of three injections, 2 weeks between each.

Hip arthritis – course of three injections, 2 weeks between each.

Further Reading

Am J Sports Med. 2016 Mar;44(3):664-671
Am J Sports Med. 2016 Mar;44(3):792-800
American Journal of Sports Medicine, Vol. 40, No. 12 Pg 2822-2827
Arak Medical University Journal (AMUJ) 2015; 18(98): 97-106
Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 31, No 11 (November), 2015: pp 2213-2221
Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 31, No 2 (February), 2015: pp 306-320
Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 32, No 3 (March), 2016: pp 495-505
Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 32, No 5 (May), 2016: pp 906-918
BioMed Research International Volume 2017, Article ID 7538604, 11 pages
Clin Podiatr Med Surg 34 (2017) 161–174
einstein. 2013;11(1):122-7
Foot & Ankle International® 2018, Vol. 39(7) 780–786
Global Adv Health Med.2013;2(2):26-31
Hunter Imaging Group Platelet Rich Plasma (PRP) Injection for Osteoarthritis
International Journal of Surgery 38 (2017) 109-116
International Journal of Surgery 67 (2019) 37–46
J Orthopaed Traumatol (2016) 17:101–112
Journal of Orthopaedic Surgery 2016;24(1):62-6
Journal of Orthopaedic Surgery 2016;24(1):62-6
Journal of Orthopaedic Surgery 26(1) 1–8
Journal of Orthopaedic Surgery and Research (2017) 12:16
Knee Surg Sports Traumatol Arthrosc (2016) 24:3787–3792
Knee Surg Sports Traumatol Arthrosc (2018) 26:1984–1999
Laudy ABM, et al. Br J Sports Med 2015;49:657–672.
Mid Cheshire Hospital NHS foundation trust patient information platelet rich plasma (PRP) injections
National Institute for health and clinical excellence (UK) - nice guidelines for treating tendinopathy by injecting the patient's own blood into and around the painful tendon
Orthop Clin N Am 48 (2017) 351–357
Orthopedics. 2018; 41(2):e262-e267
Physical Medicine and Rehab 7 (2015) 637-648
Physical Therapy in Sport 18 (2016) 68-73
Royal Berkshire NHS foundation trust information for patient having a platelet rich plasma (PRP) injection
Sports Med (2018) 48:971–989
Stanford School of medicine platelet rich plasma (PRP) injection – information and instructions patients
The American Journal of Sports Medicine 2019;47(8):1789–1796
The American Journal of Sports Medicine, Vol. 43, No. 12
The Orthopaedic Journal of Sports Medicine, 5(5), 1-12
the surgeon 16 (2018) 250-258
University of Wisconsin sports rehabilitation platelet rich plasma rehabilitation guidelines

This handout was designed by Chris Wainwright and thebonedoctor.net & is not to be modified or re-used without permission. It can be freely distributed as a standalone document.