The Royal Australian and New Zealand College of Ophthalmologists

# Guidelines for Performing Intravitreal Therapy

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*We acknowledge the Aboriginal and Torres Strait Islander Peoples, the Traditional Owners of Country throughout Australia and recognise their continuing connection to land, waters and community. We pay our respects to them and their cultures; and to their Elders past, present and emerging.*
*In recognition that we are a bi-national College, we also acknowledge the Rangatiratanga of Māori as Tangata Whenua and Treaty of Waitangi partners in Aotearoa New Zealand.*

# 1. Purpose and Scope

This document aims to provide the ophthalmologist with guidance to prepare the patient and safely perform intravitreal therapy, regardless of the environment in which treatment is performed. The location used for procedures should comply with relevant national healthcare standards.[1]

There are some important post-operative principles that need to be followed, but the specific follow-up details depend on the drug that has been injected and are beyond the scope of this document.

# 2 Intravitreal Therapy Technique – A Step-by-Step Guide

## 2.1 Pre-treatment counselling and consent

It is essential to obtain informed consent for intravitreal therapy, and such informed consent must contain a clear explanation of the potential vision threatening complications of an intravitreal injection. Specifically, the patient needs to be informed of the risk of endophthalmitis, retinal detachment, traumatic cataract and significant vitreous haemorrhage. In patients receiving intravitreal steroids, the risk of a steroid induced intraocular pressure rise and increased cataract formation, must be discussed. It should be noted that the current PBS requirements for dexamethasone (Ozurdex®) limit this to either those that are pseudophakic or are listed for cataract surgery. The use of a printed information sheet may be a useful adjunct for informed consent, and a sample document is included in these guidelines (Appendix A).

Informed consent should be re-confirmed with the patient under certain circumstances:

(a) The clinician becomes aware of new or latent complications or adverse reactions which were not necessarily known at the time the procedure was first offered to the patient, and therefore not discussed as part of the original consent process

(b) Changes in the patient's ophthalmic and general clinical condition, which may result in a change in the benefits and / or risk of the treatment

(c) Availability of alternative therapies to the one for which the patient has originally consented.

It is also essential that the patient understands how to contact the ophthalmologist or clinic where the intravitreal injection was performed, if they have a problem following treatment. A sample instruction sheet is attached (Appendix B).

## 2.2 Pre-injection assessment

Active ocular surface infection should be controlled and treated prior to the use of the intravitreal therapy. Many patients take anti-platelet agents or anticoagulants. It is not necessary to cease these medications prior to the intravitreal therapy. Such patients may be warned that they are more likely to sustain subconjunctival haemorrhage following intravitreal injection.

[1] In Australia: Australian Commission on Safety and Quality in Health Care (ACSQHC) (September 2011), National Safety and Quality Health Service Standards, ACSQHC.

There is some controversy regarding the use of intravitreal steroids in patients who are steroid responders. It is beyond the scope of these guidelines to provide specific information in this area, and ophthalmologists need to make an individualised decision regarding the safety of intravitreal steroids in patients who are steroid responders and in those who have pre-existing glaucoma. Patients with a history of herpetic keratitis or intraocular opportunistic infection need careful assessment as it is recognised that intraocular steroids may be contraindicated in patients with these conditions.

## 2.3 Consent and correct patient / site confirmation

Intravitreal injection is an invasive procedure, and standard precautions to confirm consent and correct patient and site should be taken, regardless of location of the injection (clinic rooms or operating theatre):

- Written informed consent documentation should be checked. Many patients undergoing intravitreal therapy will require an ongoing course of treatment, and this may be indicated on the consent form. The eye due to undergo intravitreal therapy should be clearly marked (e.g. with a marking pen on the forehead above the correct eye) and this should be confirmed with the patient's medical record / consent form as the correct eye ("Time Out"). The drug to be injected into the eye should also be confirmed.

## 2.4 Pre-injection preparation

Table 1 lists the basic equipment necessary to perform intravitreal injections. The instruments may be supplied as a pre-prepared sterilised pack for convenience.

- At a minimum, topical anaesthetic is necessary for intravitreal therapy. However, many ophthalmologists additionally use gel or subconjunctival anaesthetic at the proposed site of intravitreal injection.
- A critical step prior to injection is to use topical antiseptic to irrigate the ocular surface and conjunctival sac. The usual preferred antiseptic is either povidone-iodine 5% or chlorhexidine 0.1% aqueous solution. Despite adequate topical anaesthesia, these may cause significant ocular surface irritation, and it is recommended that any residual antiseptic be irrigated from the ocular surface, and especially the conjunctival fornices, at the conclusion of the injection. It is essential that alcoholic chlorhexidine, which is highly toxic to the cornea, is not used on or around the eye. The eyelashes and margins of the eyelid must not contaminate the needle during injection. The most reliable way to ensure this is the use of a lid speculum.
- Sterile gloves should be worn. The use of a sterile drape is left to the individual ophthalmologist's discretion.
- It is recommended that the ophthalmologist wear a mask. If the patient can't avoid talking / coughing during the procedure they should wear a mask. If other staff (nurse, orthoptist etc) or family members are present in the room, they too should also wear a mask.

## 2.5 Injection technique

A sterile syringe and needle are used to give the intravitreal injection. A 27-gauge needle is required to inject triamcinolone given its particulate nature, while a 30 gauge (or smaller) needle can be used for other drugs. The injection should be given 3-4mm from the limbus in a pseudophakic eye and 4mm from the limbus in a phakic eye.

If the needle touches eyelashes or anything else that is potentially non-sterile before entering the eye, the needle should be discarded and replaced with a fresh one. This will mean that a lower dose of drug will be injected because of loss of volume in the dead space of the needle.

## 2.6 Post injection management

(a) The intraocular pressure is increased for several minutes following an intravitreal injection, and the degree of elevation depends on a number of factors, principally the volume injected. There may be non-perfusion of the central retinal artery for several minutes following injection, though this is uncommon with the standard 0.05mL dose used for anti-VEGF therapy. Non-perfusion is typically accompanied by significant visual loss or total loss of vision in the injected eye. In the vast majority of patients, vision returns within 5 minutes as the intraocular pressure lowers. It is seldom necessary to perform an anterior chamber paracentesis when the volume injected is less than 0.1 ml. The patient's vision should be monitored post injection to ensure there is visual recovery prior to discharge.

(b) Although post injection topical antibiotics following have been used in most large clinical trials of intravitreal therapy, there is no evidence that such antibiotic use lowers the rate of postoperative endophthalmitis. Resistance to topical antibiotics develops rapidly and may select out more virulent strains of bacteria. The vitreous penetration of topical antibiotics is also questionable. Pre-injection antibiotics have been shown to confer little benefit over topical povidone-iodine 5% alone. For these reasons, antibiotics are not routinely recommended either pre- or post-injection. Predisposing lid abnormalities/infections should always be treated however, and if necessary, injection should be deferred until there is no active infection.

(c) It is critically important that the patient is aware that severe pain, worsening of vision, new floaters or increasing diffuse conjunctival injection require urgent re-assessment by the ophthalmologist. A mechanism must be in place to allow the patient to contact the treating ophthalmologist or a facility with ophthalmic staff after hours. Endophthalmitis typically occurs within five days of the injection. The presentation may be atypical, particularly if steroids have been injected intravitreally. The precise follow-up regimen following intravitreal therapy needs to be individualised dependent upon the medication that has been injected, and full details are beyond the scope of this document.

(d) Some drugs, particularly intravitreal triamcinolone, have additionally been associated with a sterile non- infectious form of severe intraocular inflammation sometimes termed "sterile endophthalmitis" or "pseudo-endophthalmitis". The differentiation between infectious and non- infectious post-injection inflammation in eyes following intravitreal injection may be impossible, and whenever there is doubt, the eye should be managed as if it has infective endophthalmitis, using standard treatment. Such management typically involves vitreous and aqueous taps for microbiology, followed by intravitreal broad-spectrum antibiotics. Prompt treatment of suspected endophthalmitis is essential. Clinics performing intravitreal therapy should consider having available an "endophthalmitis kit" (Appendix C), depending on their proximity to facilities capable of urgently treating endophthalmitis, Full treatment guidelines for endophthalmitis are beyond the scope of this document.

### 2.7 Bilateral same day injections

It has become increasingly common for patients to undergo bilateral intravitreal therapy. Some patients will specifically request bilateral same-day treatment to reduce the burden of treatment visits, or because of the need to travel long distances for treatment. Although same-day bilateral treatment has not been studied in randomised controlled trials, it has become an accepted practice performed by retinal specialists worldwide. It is essential that intravitreal treatment of each eye be considered as a separate sterile procedure, conducted according to the above guidelines. Although there is generally very low-level systemic absorption of intravitreally injected medications, there may be safety concerns with intravitreal anti-VEGF agents in certain patients. Bilateral same-day injection will increase the potential systemic absorption of intravitreal medications, and this must be considered in patients where there are potential systemic safety concerns.

## 3. Summary of standard guidelines for intravitreal injections

- Safe to give intravitreal therapy in clinic or operating theatre setting
- Informed consent and correct site procedures (“time out”) essential
- Surgeon and other staff to wear mask
- Topical antiseptic pre injection
- Topical +/- gel or subconjunctival anaesthesia
- Lid / lash control (eg speculum), sterile gloves +/- sterile drape
- Follow up regimen depends on drug injected
- Mechanism to contact Ophthalmologist urgently post injection
- Post-injection endophthalmitis must be treated as an emergency

### Table 1: Pack for intravitreal therapy

- Sterile dressing tray
- 5% povidone iodine or 0.1% aqueous chlorhexidine Topical +/- subconjunctival anaesthetic Syringes, needles Sterile lid speculum
- Sterile gloves +/- sterile drape

### Appendices:

Appendix A: Information Sheet and Consent Form
Appendix B: Instructions for Patients following Intravitreal Injection
Appendix C: Intravitreal antibiotic preparation / injection

## 4. Record of amendments to this document

| Page | Details of Amendment | Date Amended |
|---|---|---|
| | | |
| Entire document | Minor changes throughout | June 2017 |
| | | |
| | | |
| Entire document | References updated<br>Minor changes throughout | March 2019 |
| | | |
| Entire document | Minor changes throughout | March 2020 |
| | | |
| Appendix C: Endophthalmitis pack | Changes under section: Technique | August 2026 |

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# Appendix A: Intravitreal Injections Information Sheet and Consent Form

## What is an intravitreal Injection?

An intravitreal injection is an injection into the vitreous which is the jelly like substance inside your eye.

## Why is an intravitreal injection performed?

Intravitreal injections are used to deliver drugs to the retina and other structures in the back of the eye. Common conditions treated with intravitreal injections include diabetic retinopathy, macular degeneration, retinal vascular diseases and ocular inflammation. These conditions often require a course of repeated intravitreal injections.

## What is the intravitreal injection procedure?

We will lie you in a comfortable position. Anaesthetic (numbing) drops will be placed in your eye, and your eye will be cleaned with an antiseptic solution. This may initially cause a stinging feeling. The eye is usually held open with an instrument (speculum). The medicine is then injected into your vitreous: you may feel slight pressure and a momentary sharp feeling on the eye when this is done. After the injection procedure, the doctor will check your eye and your eye may be covered with an eye pad.

## What are the side effects?

After the injection you may have a gritty feeling in the eye, and the eye may look bloodshot. This will usually resolve over a few days. You may see floaters which will become smaller and disappear over one to two weeks. Sometimes you may see round floaters which are tiny bubbles of air - these are harmless and will be absorbed by the eye within 1-2 days.

## Are there any risks?

Injecting any medication into the eye may result in increased pressure within the eye, inflammation, or more serious side effects such as cataract formation, bleeding within the eye, damage to the retina (retinal detachment or tear) or other eye structures. These side effects are rare, estimated at less than 1 per 1000 injections. It is possible that you may get an infection within your eye (endophthalmitis) as a result of the intravitreal injection. The chance of an infection is low (estimated at less than 1 per 1000 injections). An infection may lead to vision loss or, in rare cases, loss of the eye.

## Preparation for the injection:

It is very important for you to tell us about any health conditions that you have, all the medications that you are taking, and especially any allergies to medications that you have had in the past. You will be asked to sign this form on the day of your appointment.

## CONSENT TO INTRAVITREAL INJECTION

I have read, or have had read to me, the above information concerning the procedure of intravitreal injection and understand it to my satisfaction.

I consent to the procedure being performed.

I understand that repeated injections are required, and I consent to a course of continued injections. I may decide to discontinue treatment and withdraw this consent at any time. (Delete above paragraph where applicable)

Signature of Patient: Date: / /

Witness: Date: / /

# Appendix B: Instructions for patients following intravitreal injection

Name: _____ Date: / /

You have had an injection of

into your right / left eye _____

- If you have an eye pad on your eye, please try to keep your eye closed. You may remove the eye pad two hours after the injection.
- If you have been given eye drops, please use them times a day – Paracetamol or a simple pain tablet may be taken if necessary.

## You may notice any of the following over the next two days:

- Grittiness / feeling of something in the eye: this can be quite severe in the first few hours after the treatment, but should settle down after that
- Redness of the eye, especially in the area where the injection was given. Occasionally there will be a large red spot on the white of the eye. This should be painless, and the vision will not be affected. It will gradually disappear.
- Blurry vision
- Floaters or “blobs” in your vision: these will become smaller and disappear over a few days. If you have had an injection of triamcinolone, the floaters may persist for a longer time. Check this with your doctor.
- You will be given an appointment for your next checkup, and next injection if necessary, at the reception desk before leaving.

## You must report if you have any of the following:

- Severe pain
- Marked worsening of vision or loss of vision
- Floaters/clouds in the vision which are new or increasing in the days after injection

**In case of emergency call**

_____

**Or go to the Emergency Department at**

_____

## Appendix C: Endophthalmitis pack

Keep this page inside pack (plastic bag) containing all of following Check expiry every 6 months and replenish after use.

- Pack contents:
- Xylocaine 2% (with or without adrenaline 1 in 100,000)
- Vancomycin – 1 ampoule 500mg
- Ceftazidime (Fortum) – 1 ampoule 1g
- Sterile lid speculum
- Sterile toothed forceps
- Intravitreal injection pack (if needed)
- Sterile gloves
- Povidone-iodine 5%
- Syringes (with spares) – 10ml x2, 5ml x 4, 2ml x3, 1ml x 4
- Needles (with spares) – 30 gauge x5, 18G drawing up x 3, 23 gauge x 2 Sterile cap for syringe (for vitreous sample)
- Normal saline (10ml) for injection – 5 ampoules
- Local pathology request form and specimen bag

### Technique

1. Prepare antibiotics before tap and inject procedure.

    a) Preparation of Ceftazidime (2mg/0.1ml)

    i. Add 10ml of 'water for injection' to the 1g vial of ceftazidime (1g/10mL = 100mg/mL)
    ii. Withdraw 0.2mL of the solution from the vial using a 1mL syringe (20mg/0.2mL)
    iii. Add 0.8mL of 'water for injection' to this syringe (20mg/1mL = 2mg/0.1mL)
    iv. Draw up and label 0.1ml of this in 1ml syringe (2mg in 0.1ml) ready for injection into the eye (30 G needle).

    b) Preparation of Vancomycin (1mg/0.1ml)

    i. Add 10ml of 'water for injection' to the 500mg vial of vancomycin (500mg/10mL = 50mg/mL)
    ii. Withdraw 0.2mL of the solution from the vial using a 1mL syringe (10mg/0.2mL)
    iii. Add 0.8mL of 'water for injection' to this syringe (10mg/1mL = 1mg/0.1mL)
    iv. Draw up and label 0.1ml of this solution (1mg in 0.1ml) ready for injection into the eye (30 G needle).

2. Inject subconjunctival local anaesthestic in the area of tap and inject then apply topical betadine. Once anaesthetic is active, place eyelid speculum.
3. With 25-gauge needle on 1 or 2ml syringe, insert needle through pars plana into mid vitreous cavity, and aspirate tap sample (~0.3 ml). If dry vitreous tap, repeat with 23-

gauge needle.

4. Inject vancomycin 0.1ml (1mg) through pars plana (toothed forceps often required to stabilize the eye which is now softer after the tap).

5. Inject ceftazidime 0.1ml (2mg) as above.

6. Check eye pressure. If dry vitreous or minimal biopsy sample obtained initially, may need to do anterior chamber paracentesis with a 25-gauge needle to normalize intraocular pressure after the intravitreal antibiotics have been given

7. Send specimen for urgent microscopy / culture / sensitivity
8. Commence intensive topical steroids and topical antibiotics +/- oral antibiotics +/- oral steroids.