

What are Scleral Lenses?

Scleral lenses are rigid lenses designed to rest on the white of the eye or sclera, providing remarkable comfort.

Sclerals are a great alternative to other rigid lenses. They are ideal for a variety of eye conditions, high prescriptions, and some forms of dry eye disease. Like rigid lenses, they provide the highest quality of vision with lower rates of infection as compared to soft contact lenses.^{1,2}



Why should I use a Scleral Contact Lens?

Scleral lenses were the first type of contact lenses invented, originally as glass moulds of a person's eye.³ Today we utilise advanced technologies and materials to offer scleral lenses to a range of patients.⁴

EYE DISEASE

Many eye diseases are best managed with RGP (rigid gas permeable) and particularly scleral RGP contact lenses. These include keratoconus, pellucid marginal degeneration, corneal grafts, corneal dystrophies, corneal scarring from injury, dry eye disease, and altered eye surfaces following corneal refractive surgery.

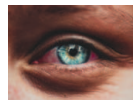
The most common condition fitted with scleral lenses is keratoconus. The irregular distortion of the cornea limits the quality of vision possible with spectacles or soft contact lenses.²

Wearing a smooth rigid contact lens over the cornea allows tears to fill in the space between the rigid lens surface and the corneal irregularity, neutralising most of the corneal distortion.

This gives wearers better definition and contrast, which improves vision and decreases ghosting. Similar benefits are achieved for the irregular corneal surfaces present in all the corneal diseases mentioned above.

DRY EYE DISEASE

Scleral lenses are beneficial for patients with debilitating dry eye conditions such as Sjogren's syndrome. A scleral lens has a reservoir of tears retained between the lens and eye during wear, providing significant relief from corneal dryness.



HIGH PRESCRIPTIONS

Patients with high refractive errors such as astigmatism, myopia or hyperopia may not achieve satisfactory vision or comfort in spectacles, soft contact lenses or smaller diameter corneal RGP lenses. The improved quality of vision and comfort offered with a scleral lens make them an excellent alternative.

STABILITY AND COMFORT

Active persons such as sports players can benefit from the stability and quality of vision scleral lenses offer. They are also an excellent option for persons who have stopped wearing small diameter rigid lenses due to discomfort from environmental factors. As the lenses seal on the sclera and cannot dislodge easily, they are ideal for most sports and people working in dusty environments. If you are a current contact lens wearer and experience difficulties with your lenses, make sure to ask your optometrist if scleral lenses would be ideal for you.



How do Scleral lenses work?



Scleral lenses are much larger than rigid corneal lenses or soft contacts, ranging from 15.00 mm to 20.00 mm in diameter. They vault the whole cornea and rest on the sclera, sitting behind the upper and lower eyelids. As the lids do not touch the lens edges, they are typically very comfortable. Sclerals are filled with saline or artificial tears to bathe the cornea and prevent trapped bubbles.

You may initially be aware of the scleral lenses in your eyes, however, as you start to wear them, your eyes will typically become accustomed to them within the first month of wear. Most scleral patients wear their lenses for long daytime periods due to their excellent comfort and vision quality. It is, however, a good idea to give your eyes a break from wear in the evenings if your eyes feel tired.

Lens complications, though minimal if instructions are followed correctly, include:

- Mild redness after lens removal.
- Slight fogging of vision as the day progresses.
- Reaction to lens solutions, requiring a change to a different type of solution.

How are my Lenses Designed?

At your initial appointment, we will take a range of measurements from each eye. This data, together with information gathered from fitting diagnostic lenses, is imported into a lens simulation software called EyeSpace, which is then used to order and fine tune your lenses.⁵

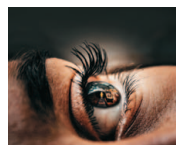
EyeSpace is now used by contact lens practitioners across the world including Australia, USA, New Zealand and South Africa. EyeSpace customises each lens to your prescription and eye shape to a degree of accuracy smaller than one micron.

What will happen at my Scleral lens appointments?

DELIVERY AND TEACH

If you have never worn contact lenses, it can be helpful to practice some eye touching techniques before your appointment. Wash your hands thoroughly to begin.

- Practise inserting lubricating eye drops, holding your eye open.
- Open the top and bottom eyelids wide with your middle fingers.
- Looking up, gently touch the white of the eye with your index finger.



At your appointment, your optometrist will examine the design and fit of your customised EyeSpace scleral lenses on the eyes, and you will be taught how to insert, remove, clean and care for your lenses.

ONE WEEK FOLLOW-UP VISIT

Most patients will be asked to return for a weekly follow-up appointment.

- Your insertion and removal technique
- Your vision quality in the lenses
- The fit of the lenses on the eye
- The health of the eye surface

In some cases we may decide to make some fine adjustments to the design, with a new lens under warranty, this is normal.

ONGOING FOLLOW UP

Follow up appointments will be scheduled after three months, then six months. These are vital to monitor the success of your contact lenses. Some ocular health complications may be present without any discomfort or vision trouble. Scleral lenses can last much longer than soft lenses. We recommend replacing them every one to two years to ensure they work optimally and do not cause any adverse effects. If you are experiencing any problems, please contact us to arrange an appointment.

We recommend six-monthly follow up examinations for scleral lens wearers to ensure your lenses are clean, you are seeing well and your eye health is uncompromised.

Frequently asked questions

• ARE THERE AGE RESTRICTIONS FOR SCLERAL LENSES?

There is no age limit to wearing scleral lenses. However, most conditions that require a scleral lens aren't present until an older age. If children require scleral lenses, they need to be old enough to insert and remove the lenses themselves or have adult supervision who can insert and remove the scleral lenses on their behalf. Many older adults wear scleral lenses but need the dexterity to be able to insert and remove the lenses safely.

• CAN THE SCLERAL CONTACT LENSES DAMAGE MY EYES?

Any contact lens has the potential to cause damage or infection if they are misused. Proper hygiene, lens care and timely replacement can minimise the risks. Long-term wear of poorly fitting lenses may harm your cornea, and progressive conditions such as keratoconus may cause corneal changes which result in a poor fit. Regular reviews are therefore critical to ensure a healthy scleral lens fit.⁶

• HOW DIFFERENT ARE THE SCLERAL LENSES FROM OTHER RIGID LENSES I HAVE WORN?

Scleral lenses are designed to rest on the white of the eye and are therefore larger than rigid corneal lenses. The larger lens improves comfort, as it never touches the cornea. The insertion and removal techniques are a little different to other contact lens types, but solutions are similar to those used for smaller rigid lenses.

- CAN I SLEEP IN MY SCLERAL LENSES?

No! Nightly wear of scleral lenses is not recommended. Scleral lenses reduce the oxygen flow to the cornea when the eyes are closed during sleep, which leads to compromised eye health over time. Your lenses also need to be sterilised and cleaned each day to reduce the risk of infection.

- I AM OVER THE AGE OF 45 AND NEED MULTIFOCALS OR READING GLASSES, CAN I STILL WEAR SCLERALS?

Absolutely. Your optometrist will discuss with you all the options available to correct both your distance and near vision.

- HOW OFTEN WILL I HAVE TO REPLACE MY SCLERAL CONTACT LENSES?

We recommend replacing your lenses every one to two years, depending on their condition. Frequent replacement of the scleral lenses decrease the risk of eye infections and ensure the optical surface of the scleral lens remains smooth and clear.

- WHY SHOULD I NOT JUST GET A CORNEAL GRAFT FOR MY IRREGULAR CORNEAL CONDITION?

There are significant downsides to corneal grafts, including using cataract-inducing steroid drops for many months, potential corneal irregularity requiring a rigid lens to obtain clear vision and the high chance of graft rejection over time (40% probability of survival after 18 years.). It is important to note that surgical trends are also shifting with a lower number of grafts on those under the age of 40 as compared with 25 years ago. With advances in scleral lens wear, most people do not need a corneal graft unless significant corneal scarring prevents good vision even with a scleral lens.⁷

- WHAT ONGOING COSTS ARE REQUIRED FOR SCLERAL CONTACT LENS WEAR?

You will need regular solutions and insertion drops. We also recommend a spare set of lenses.

- HOW DO I GET STARTED TO FIND OUT IF I AM SUITABLE FOR SCLERAL LENSES?

A full examination is needed, even if you had a recent eye test with another eye care practitioner. During this exam, your eye health, vision and corneal shape are evaluated to establish if your eyes are suitable for scleral lens wear. If you have had a full eye exam with us in the last 12 months, you might just require an additional corneal topography examination and a brief discussion with our optometrists regarding scleral lens wear.

¹CShaughnessy MP, Ellis FJ, Jeffery AR, Szczotka L. Rigid gas-permeable contact lenses are a safe and effective means of treating refractive abnormalities in the pediatric population. *CLAO J.* 2001 Oct;27(4):195–201.

²Suarez C, Madariaga V, Lepage B, Malecaze M, Fournié P, Soler V, et al. First Experience With the ICD 16.5 Mini-Scleral Lens for Optic and Therapeutic Purposes. *Eye Contact Lens. Eye & Contact Lens: Science & Clinical Practice*; 2016 Jul 12.

³Development of contact lenses and their worldwide use. 2007 Nov;33(6 Pt 2):343–5–362–3.

⁴Fadel D. Modern scleral lenses: Mini versus large. *Cont Lens Anterior Eye.* 2017 Aug;40(4):200–7.

⁵Scleral lens fitting and assessment strategies. *Contact Lens Anterior Eye.* 2019 Feb; 42(1):9–14.

⁶Schornack M, Nau C, Nau A, Harthan J, Fogt J, Shorter E. Visual and physiological outcomes of scleral lens wear. *Cont Lens Anterior Eye.* 2019 Feb;42(1):3–8.

⁷New Zealand trends in corneal transplantation over the 25 years 1991-2015. *BMJ Publishing Group Ltd*; 2017 Jun;101(6):834–8.