

# Your Glaucoma Eye Examination: Part 1

## Your Eye Pressure

### What role does your eye pressure really play in glaucoma care?

Do you consider your eye pressure solely responsible for your glaucoma? Do you believe that eliminating “eye pressure” would prevent glaucoma? Many people may well say “Yes” to both these questions. However both are common misconceptions about high pressure.

Eye pressure is but one risk factor for developing glaucoma, albeit a most important risk factor, and the main one that can be modified.

A healthy eye must have some pressure within it. Without any pressure it would collapse like a balloon with a puncture. So the eye has a pump that produces a very small amount of fluid. That fluid circulates from behind your iris to the drainage channels in front it. If the fluid drains readily then the eye pressure will be low, but if there is resistance to drainage the eye pressure will rise. (See Diagram p4)

Some eye pressure is essential for good “eye health”, but excessive pressure causes glaucoma.

Glaucoma is diagnosed by detecting the damage to the optic nerve either directly by looking at it or indirectly by testing the visual field.

The eye pressure level is not essential to a diagnosis of glaucoma. But it is the most important risk factor for developing glaucoma.

Many studies have shown that as the eye pressure rises the risk of glaucoma is much greater. And many clinical studies have shown that reducing the eye pressure is very effective in controlling glaucoma damage.

### How is the eye pressure measured?

Eye pressure has been recognised for many centuries, as very high pressure can be felt with the fingers through the upper lid.

The gold standard device to measure the intraocular pressure accurately was developed in the 1950’s and is called the Goldmann applanation tonometer. This device measures the eye pressure by the force needed for the instrument to flatten the cornea by a precise amount. All readers of Eyelights should have experienced tonometer readings being done to measure your eye pressure.

Many other devices have been developed to measure eye pressure more simply without using anaesthetic or touching the eye. These other devices are good at detecting very high pressures but the values may vary from those measured on a Goldmann.

The accuracy of all pressure measuring devices relies on good technique. All eye care professionals should be capable of accurately taking the eye pressure with a Goldmann tonometer.



### Why does my eye pressure change?

Eye pressure in a normal eye varies with the pulse of the heart, varies during the day and varies over seasons. It also generally rises with advancing age. In an eye with glaucoma the variation is greater and there is the additional effect of your glaucoma medication. Your blood pressure essentially has no bearing on your eye pressure.

Variation in pressure during the day is called diurnal fluctuation. For most normal eyes the pressure is highest in the early morning between 6am and 8am. This daily fluctuation is a hormonal effect on the eye.

There are more long-term fluctuations during the year that we do not understand.

In addition the eye pressure does slowly increase with age as tissues harden to cause an increased resistance to the flow of fluid out of the eye.

In eyes with glaucoma a wider variation in eye pressure occurs during the day and throughout the year. But large variations in eye pressure usually indicate that glaucoma medications are not always being used correctly.

### What do you do that might raise your eye pressure and harm your eye?

Firstly eye pressure varies with posture. It is higher when we lay face down compared to sitting. This effect is greatly accentuated if we stand on our heads! Many studies have looked at the effect of yoga posture on glaucoma. We now recommend people with glaucoma not to subject their eye to the very large increase in pressure that occurs with a head down body posture.

Secondly drinking a large volume of water will increase the eye pressure. This is used as a provocative test to assess the ability of an eye to drain fluid. The person drinks one litre of water over 15 minutes and the eye pressure is measured frequently over the subsequent 90 minutes. Normally the eye pressure elevates by up to 50% but returns to normal by 90 minutes.

In the glaucoma eye the pressure rise is much more dramatic and lasts longer because the extra fluid created by the bolus of water cannot drain quickly. So if you have glaucoma it is wise not to drink large volumes in a short time period e.g. three cups of tea or a couple of pints of beer in a quarter hour!

Thirdly the eye pressure can elevate when we strain like exhaling with our mouth shut! This is called the Valsalva manoeuvre. It occurs in activities like straining at stool, and blowing wind instruments. This will cause a temporary but pronounced rise in eye pressure. When undertaken frequently it may significantly stress the optic nerve and accentuate glaucoma damage.

### How frequently should eye pressure be measured?

Eye care practitioners balance the logistics of pressure measures with the risk to your sight and the effectiveness of glaucoma medications in deciding just how often you should have your pressure measured.

Accurate measurement of eye pressure assesses this important risk factor and shows how effectively your glaucoma medications are working. For best comparison of measurements the time of day and the time from last use of glaucoma medications should be recorded.

Frequent measures of eye pressure would detect peak levels and fluctuation. There is an ongoing quest to develop a means to continuously monitor eye pressure or self-monitor eye pressure. Unfortunately, despite extensive research, there is no such device.

**What eye pressure doesn't tell you is whether the glaucoma damage to your optic nerve is stable or progressive. That can only be determined by assessing the optic nerve head or testing the visual field.**

**These two topics will be covered in Eyelights during 2008.**