

Eyelights



The Newsletter of Glaucoma NZ
Volume 11 | Issue 1 | April 2014

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Procedures for
Glaucoma**

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Glaucoma Worldwide

The worldwide prevalence of glaucoma is increasing. This is due in part to the rapidly aging population. It is estimated that by 2020 the number of people in the world with primary glaucoma will be almost 80 million, with over 11 million suffering from bilateral blindness.



In developed countries, fewer than 50% of those with glaucoma are aware of their disease. In the developing world, the rate of known disease is even lower. Whereas about 10% of the open-angle glaucoma patients are bilaterally blind, the figure for angle-closure is about 25%. Hence, more people are blind from angle closure, even though it is far less common.

Interestingly, the type and severity of glaucoma varies across the world.

New Zealand/Australia (European descent)

The most common type of glaucoma in New Zealanders of European descent is open angle glaucoma. This type of glaucoma has no symptoms until very late in the disease. It is estimated that 10% of people over the age of 70 and 2% over the age of 40 have glaucoma. It is the leading cause of preventable blindness.

Continued over page

Maori

Interestingly, glaucoma is almost non-existent amongst Maori. The reason for this is unknown but it is an exciting observation that there are a group of people who have some genetic features that protect them from glaucoma.

Asia

Asia accounts for a disproportionate amount of the glaucoma burden: 60% overall and 80% of angle closure. In angle closure glaucoma the drainage canals get blocked resulting in the eye pressure rising. The reasons for this disparity are unclear, although angle closure can be partly explained by anatomic features: shallow anterior chamber, narrow angle, smaller eye. Hence, angle closure glaucoma is more common in females and patients of older age.

Eskimos

Studies amongst Alaskan Eskimos have shown that open angle glaucoma is rare but there is a higher occurrence of angle closure glaucoma. In particular older Eskimo women are at high risk for developing angle closure glaucoma.



African Heritage

Open angle glaucoma affects those of African heritage more. It occurs about five times more often in African-Americans, and blindness from glaucoma is about six times more common. In addition to this higher frequency, glaucoma often occurs earlier in life - average about 10 years earlier than in other ethnic populations. Although the reasons for these findings are unknown, researchers are becoming more and more certain that those of African heritage are genetically more susceptible.

Hispanic

Open angle glaucoma is more common among U.S. Hispanics than previously thought and is the leading cause of blindness. A study in Los Angeles reported that glaucoma is four times more common in Latin Americans and that 75% were not aware that they had the disease.

Scandinavians

Exfoliation glaucoma is a subtype of the disease that is caused by a condition called exfoliation syndrome. Small bits of whitish material flake off from cells in the eye and get stuck in the eye's drainage system, leading to increased pressure. Scandinavians have the highest rates of exfoliation syndrome in the world. People with Icelandic, Russian, Jewish, Irish, Middle Eastern, Indian and Japanese ancestry also have high rates of exfoliation syndrome. A variation in one gene called LOXL1 accounts for more than 99% of cases of exfoliation glaucoma, probably by increasing the risk of exfoliation syndrome. These variations in LOXL1 do not increase the risk for any other type of glaucoma.

Australian Aborigines

Interestingly, Australian Aborigines have exfoliation **syndrome** (they have the whitish material in their eye) but do not get exfoliative glaucoma. The reason for this is not known.

New Surgical Procedures for Glaucoma

For most patients, glaucoma is treated by instilling eye drops. There are however a number of problems with eye drops: patients need to go to the chemist regularly to get their drops, there is cost, and eye drops can cause a wide range of side effects.

Even if drops are well tolerated, they do over time tend to make eyes inflamed and less comfortable.

The major problem with drops is what is referred to as "compliance", or "adherence": patients need to remember to get their drops in regularly, to want to do this, and to manage this.

Any study ever done has shown that a large proportion of glaucoma patients miss getting their eye drops in at times, or most of the time.

Laser is a good alternative for some patients but does not always work, or lower pressure enough by itself. Surgery tends to be used when glaucoma is not controlled by other measures, and can achieve great intraocular pressure control without depending on compliance.

The two types of glaucoma surgery widely used are trabeculectomy, and glaucoma tube shunts, such as the Molteno or Baerveldt drains.

The problem is that both procedures have significant rates of complications and unfortunate side effects: if you need these operations they are well worth proceeding with, but the rates of problems with them mean we do not generally advocate them for earlier glaucoma where there is not great risk of imminent vision loss.

Wouldn't it be great to have "safe" low risk glaucoma surgery then? Your glaucoma is diagnosed; you undergo a procedure, and then have control for a number of years until you need another procedure?

Many glaucoma experts think likewise, and

over recent years a number of new procedures have been developed with this aim in mind.

Some of these procedures are new, but many have been around for some time. None yet have won over the majority of glaucoma opinion.

Be wary about what you read: advocates will often have greater enthusiasm for their procedure than general opinion, and there are strong commercial interests tied up in many of these new technologies.

Often studies supposedly supporting new technologies are flawed.

One common error is to combine the procedure with cataract surgery, and report the results without comparing them to the effects of cataract surgery alone, which in itself can cause significant drops in eye pressure in many patients.

Very briefly, these procedures generally are safe.

The issues are:

- Do they provide more than just a little eye pressure lowering?
- Is the cost justified?
- Can pressure control be achieved without additional eye drops?
- Does pressure reduction last for a reasonable time?

Sometimes they are referred to as "MIGS": Minimally Invasive Glaucoma Surgery.

Some of the New Surgical Procedures for Glaucoma

Opinions expressed are those of the author and certainly can be challenged!

Non-penetrating surgery

Not so new, and fairly widely used in South Africa and Switzerland, this category of surgery includes a number of largely similar procedures such as visco-canalostomy. These procedures are a safer (and less effective) variation of trabeculectomy.

“Ab interno” devices

These devices create a passage from the anterior chamber to allow aqueous fluid to leave the eye: the surgeon starts inside the eye (“ab interno”) from the anterior chamber. In other words, the first step is an incision in the cornea to allow the instrument to be introduced into the anterior chamber.

iStent

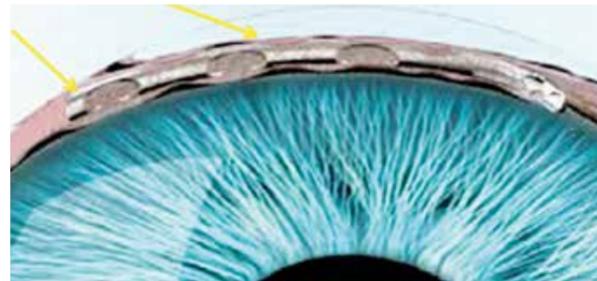
The surgeon introduces a tiny “snorkel” which creates a passage through the trabecular meshwork into the canal of Schlemm.



These have been in use for six years or so and are generally used in combination with cataract surgery. Surgeons are tending to use two or three together now as single i-Stents have had disappointing pressure lowering results.

Hydrus

A longer iStent like snorkel that opens a length of Schlemm’s canal.



Aquesys Xen

We know we cannot just run a tube from inside the eye to outside (under the conjunctiva): initially the pressure drops too low, then later scarring around the tube pushes the pressure back up high. The Aquesys Xen (a very new technology) claims to avoid these issues by being a very narrow tube made of a special material.

A similar concept is used in the **Midi Arrow** where the tube is inserted from outside the eye in.



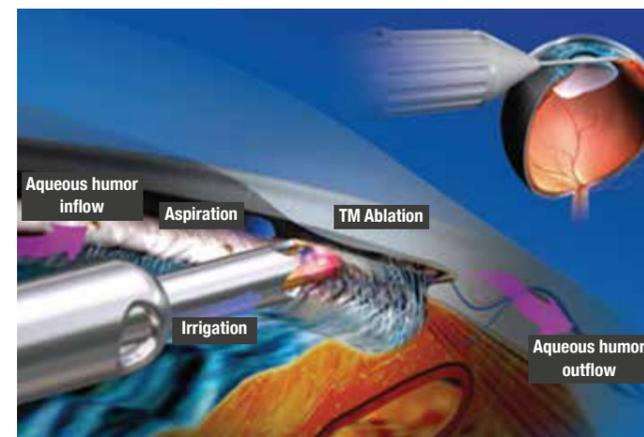
Other “ab interno” devices such as the **Cypass** are designed to drain from the anterior chamber into the suprachoroidal space, an approach many feel less likely to succeed due to scarring.

Other new technologies

Trabectome

This device vaporises and completely removes the inner wall of up to 180 degrees of Schlemm’s canal (the trabecular meshwork). The technology has been available for 9 years and 50,000 patients have been treated with it.

The machine is expensive, as are the disposable single use components, seems safe, but results can be modest.



Canaloplasty

In this technique surgery is begun as for a trabeculectomy, but instead of entering the eye a special fine light pipe is passed into the canal of Schlemm and around the eye until it has completed 360 degrees and emerges again. This procedure again requires expensive disposable equipment, is technically challenging, and can have significant complications without a great success profile.

“uc3” Ultrasound Circular Cyclo Coagulation

In advanced glaucoma at present we can use a laser to destroy part of the ciliary body, the structure in the eye behind the iris that generates aqueous, the clear fluid that circulates through the eye, and must eventually leave it. Laser cyclophotocoagulation, used for many years, can work very effectively, but carries significant risks.

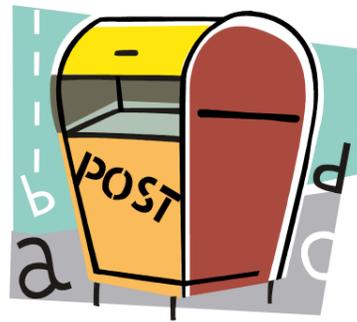
This new “uc3” technique uses ultrasound instead of laser to destroy patches of the ciliary body. Early results suggest it may be much safer than laser cyclo-destruction.

So there are some exciting new glaucoma surgery prospects on the horizon: we need to be grateful for the innovators and volunteer early patients who over time will allow us to find out which of these technologies will safely and effectively lower intra-ocular pressure for sustained periods at acceptable cost.

Suggested ways you could help Glaucoma NZ help you:

- Tell everyone about Glaucoma NZ and its services.
- Continue with your most welcome and appreciated donations.
- Arrange a community fundraising event in your area.
- Contact us to arrange for a glaucoma educator to speak at your club/organisation or workplace.
- Attend our free Public Meetings.
- Purchase an Entertainment Book.
- Suggest to your work colleagues that they hold a special day or event to support our charity.
- Support our July Annual Awareness Appeal.
- Think of us when preparing or updating your Will.

P.S. If you are looking at holding a fundraiser, please don't hesitate to contact us to discuss ideas and promotional material we have to enhance your event.



Public Mail Box

Are alternative therapies being studied for their role in glaucoma?

Many available natural compounds used as non-pharmaceutical therapy have been reported to show beneficial effects on circulation, the immune system and neuroprotective activities. The mechanism of action of neuroprotection most common to natural compounds is antioxidant/free radical scavenging activity, anti-inflammatory activity, beneficial actions on the immune system, and improvement to ocular blood flow. Many different actions are present and some extracts, such as Ginkgo biloba and curcumin, have widespread activity on a number of enzyme systems involved in cell death in glaucoma. There has been a lack of clinical trials examining neuroprotective effects of these compounds on ocular diseases. More are warranted.

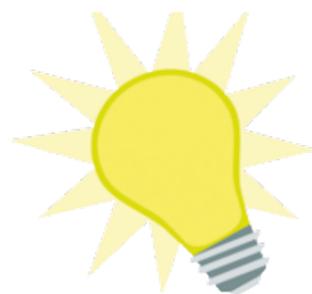
Among natural compounds and extracts of great interest for glaucoma are curcumin, omega-3 fatty acids and Ginkgo biloba.

Ginkgo biloba extract has been claimed effective in the treatment of a variety of disorders associated with aging. It appears to have many qualities applicable to the treatment of non-IOP-dependent risk factors for damage caused by glaucoma. It is believed to improve central and peripheral blood flow, reduce spasm of the blood vessels, and have protective effects against free radicals because of its antioxidant property. It has been shown to be effective in treating Raynaud's disease, which is strongly associated with normal-tension glaucoma. A study in Korea (Lee et al. 2012) concluded that Ginkgo biloba extract administration

slowed the progression of visual field damage in patients with normal-tension glaucoma. These and other properties raise the possibility that this herb may be a potential anti-glaucoma therapy.

Omega-3 fatty acids, found most notably in fish oil, play an important role in reducing oxidative damage in the retina, improving ocular blood flow and protecting against retinal ischemia (decrease in the blood supply) induced by increased intraocular pressure (IOP). While studies have not specifically addressed glaucoma, it has been suggested that fish oil may reduce IOP and be relevant to glaucoma because of its protective effect on the macula and its benefits for other eye problems.

Curcumin, a component of the commonly used spice, turmeric, is a potential neuroprotective candidate for glaucoma. Curcumin studies have increased greatly in recent years, with over 5000 papers published since 2000. Curcumin has shown possible beneficial effects in most of the mechanisms thought to be involved in the development and progression of glaucoma. A pilot study has shown that it slows disease progression, and clinical studies are not too far away.



Maximise your vision with the right lighting

Depending on your eye condition, controlling light intensity and minimising glare can be helpful. You might also find it useful to maximise contrast. Lighting can be described as either general or task-oriented. General is overhead lighting, as in the type that lights up the whole room.

There are also different kinds of light, and each person tends to have a preference for one of them. The three main kinds are incandescent, halogen, and fluorescent. Chromalux is another type of light that mimics natural sunlight. It is well worth your time figuring out which type of lighting helps you most.

Here are some tips for using lighting to maximise your vision:

- Provide general light throughout the room with additional task lighting. Avoid creating shadows. Don't work in a pool of light surrounded by darkness.
- Move lamps close to your work. To minimise glare, use an adjustable lamp and position it to the side, rather than directly in front of you. Many people find it helpful to have lamps on both the right and left sides – this will eliminate shadows.
- When writing, to prevent shadows, place the lamp on the opposite side of the hand being used. Locate the bottom edge of the lampshade just below eye level.
- To reduce glare, cover bare light bulbs of all types with shades. Soften bright light from windows with coverings like blinds for sheer curtains. Also, position the chair and table so you don't have to look directly at the light coming from the window.
- To further reduce glare, cover or remove shiny surfaces such as floors and table tops. Shiny paper can increase glare, so try to use matte paper when reading or writing.
- In hallways and stairways, provide generous amounts of lights and position so that it shines on the walls, floors, steps and railings.
- Keep all rooms evenly lit. It can be difficult for your eyes to adjust from bright light to low lights, so if you keep all rooms well lit, it will be more comfortable to walk from room to room. Try not to walk from a brightly lit room immediately to a dark one.

Source – 'Your Blue Book' with permission from Retina New Zealand Inc. (0800 233 833)

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To purchase your Entertainment Book use the enclosed Order Form, or order online at www.glaucoma.org.nz



Eye on Research

Glaucoma and eye pressure – a genetic risk?

Eye pressure is an important aspect in the development and progression of glaucoma. It is in fact the only modifiable risk factor, and all current treatments target it. Many of you may be on multiple drops to help achieve a satisfactory pressure.

A recent large study involving over 4500 individuals has identified a specific genetic marker for elevated eye pressure. Researchers found that a single mutation on chromosome 7 was linked to raised eye pressure. The affected area sits next to two genes, GLCC11, and ICA1.

The former gene is involved in sensitivity to steroids and the latter in transport across cells. It was calculated that each copy of the mutation increases the risk of development of glaucoma by 8%. In those with existing glaucoma,

each copy increases the risk of significant visual loss by 6%.

These findings are very interesting for a number of reasons. First of all, we know that steroid eye drop treatment for a variety of conditions can cause a rise in eye pressure – this mutation may have a role to play in that mechanism. Also, impaired transport across cells is thought to have a role in the development of glaucoma.

It is encouraging to see that scientific findings are helping us to understand which factors may be important in the development of glaucoma. This knowledge gives us hope that through better understanding, we can develop treatments that are effective and eventually preventative.

Link:

Blue Mountains Eye Study (BMES); Wellcome Trust Case Control Consortium 2 (WTCCC2). Genome-wide association study of intraocular pressure identifies the GLCC11/ICA1 region as a glaucoma susceptibility locus. *Hum Mol Genet.* 2013 Nov 15;22(22):4653-60. doi: 10.1093/hmg/ddt293. Epub 2013 Jul 7. PubMed PMID: 23836780; PubMed Central PMCID: PMC3904806

Making a Bequest

Including a gift to Glaucoma New Zealand in your Will is a powerful way to make a positive difference to the outcomes of those with glaucoma and their families, far beyond your lifetime.

Some initial steps to consider:

- Talk to your family. Help them understand why you want to support Glaucoma NZ into the future, as well as look after your own family and loved ones.
- Seek advice from your solicitor. People leave bequests of all sizes and no gift is too small to make a difference. Ask

about adding a codicil rather than writing a new Will.

- Decide how you wish to share your estate. Whatever the size of your bequest, please be assured it will make a real difference to those with glaucoma, and the services Glaucoma NZ provide.

For more information and to download a Bequest Form that you can discuss with your solicitor, please visit: www.glaucoma.org.nz

Alternatively phone our office: 0800 452 826 or email info@glaucoma.org.nz

**Bequest Acknowledgement:
Estate of Miriam Elizabeth Barrett**

New Developments

Contact Lens Or Eye Drops - What Would You Choose?

Many of you may currently be on a medication called Latanoprost, commonly known as Hysite or Xalatan. A group of researchers from the Harvard Medical School, the Massachusetts Eye and Ear Infirmary and the famous Massachusetts Institute of Technology have developed a contact lens that holds great promise for your future.

They have developed a Latanoprost impregnated contact lens that in animal studies was able to administer therapeutic levels of the medication for up to one month.

Using an innovative approach, they encased a thin film of the medication within the contact lens plastic itself.

You may wonder, having to put in one drop every night is not a demanding task, so why did they pursue this development? As you may be aware, glaucoma is a chronic, progressive illness, often affecting people well into their golden years.

Administering eye drops requires sufficient vision, coordination and fine motor skills, and for those with other associated medical issues this may be difficult.

Having a long-term solution that does not require monitoring or regular administration would be helpful to a great deal of patients. Imagine, having only to change a contact lens once a month, and not having to worry about eye drops during that time – the future definitely sounds convenient.

There are some caveats to this development however. First of all, human studies are probably still some time away, but it is



encouraging that the cell and animal safety studies have been positive so far. Secondly, this would involve having to get used to contact lenses, which in themselves do carry some risk.

Leaving in a contact lens for one month at a time can increase the risk of contact lens related infections, as well as damage to the surface of the eye. This may be situation where one problem is being exchanged with another.

It is encouraging to see such developments in the management of glaucoma, as these solutions show an innovative approach to the problem.

Over time and with further research, it may be that drops become obsolete in the not too far future – what a future that would be!

Reference:

Joseph B. Ciolino, Cristina F. Stefanescu, Amy E. Ross, Borja Salvador-Culla, Priscila Cortez, Eden M. Ford, Kate A. Wymbs, Sarah L. Sprague, Daniel R. Mascoop, Shireen S. Rudina, Sunia A. Trauger, Fabiano Cade, Daniel S. Kohane, In vivo performance of a drug-eluting contact lens to treat glaucoma for a month, *Biomaterials*, Volume 35, Issue 1, January 2014, Pages 432-439, ISSN 0142-9612

(<http://www.sciencedirect.com/science/article/pii/S0142961213011150>)

GNZ Professional Education Programme

2014 Programme Open for Enrolments!

Glaucoma New Zealand's 2014 Professional Education Programme is now **open for enrolments**.

- The online web-based professional education programme is approved by the NZ Optometrists & Dispensing Opticians Board CPD Committee for a maximum of **10.5 Clinical Diagnostic (CD) Credits**.
- The programme consists of 7 cases – each with a case history, questions and answers for self-directed learning, followed by an associated web-based examination.
- Successfully passing all 7 cases awards the maximum of 10.5 CD credits.

While mainly directed at optometrists, the Programme is open to any of those in the eye health field, including orthoptists, nurses and technicians.

Up to eighteen hours commitment over the year is involved.

For a full explanatory letter and enrolment options please visit

www.glaucoma.org.nz.

Please send feedback and suggestions for *Eyelights* to the Editor. Questions for the Public Mailbox are welcomed.

For New Readers

*To those of you who have joined **Glaucoma NZ** since the last issue of **Eyelights**, we welcome you!*

For your information here are some basic facts about glaucoma:

People of all ages can get glaucoma.

There are different types of glaucoma, but they all involve damage to the optic nerve, the nerve of sight, which is at the back of the eye.

Glaucoma is not curable. If you have glaucoma it must be monitored for the rest of your life.

A family history of glaucoma means you are at much greater risk of developing glaucoma.

Current treatments for glaucoma aim to lower eye pressure.

Medication in eye drops can have side effects on other parts of your body. Tell your eye specialist if you notice any change in your general well-being since you started the eye drops.

If you have glaucoma tell your relatives, especially those close relatives like sisters, brothers and adult children. They have an increased risk of developing glaucoma so advise them to have an eye examination.

Glaucoma NZ is a registered charitable trust which receives no government funding. We rely solely on donations, sponsorship, grants and fundraising. All the information available to you from Glaucoma NZ is free.



Community Fundraising to Help Glaucoma NZ

During our July Annual Awareness Month

- **Host a High Tea** - invite your friends and family to attend for a donation. A great opportunity to get together, have some fun, and raise funds.
- **Organise a book sale** with your family, friends or community group. An opportunity to share those books around and support GNZ's work.

Tell us about your community fundraiser, or if you have any queries, we would love to hear from you. Phone 0800 452 826, or email info@glaucoma.org.nz

Support Dr Sid Ogra 'Getting Dirty for Glaucoma'

Dr Sid Ogra, Glaucoma NZ's Education Fellow, is participating in the **"Tough Mudder"** adventure race on 26th of April. "Tough Mudder" is a half marathon through mud, water and a whole lot of interesting obstacles.

"It's a timely reminder that for others, life can throw many challenges. As I am passionate about preventing unnecessary vision loss, I want your support in helping Glaucoma New Zealand. They do excellent work in education, raising awareness and supporting those with this silent thief of vision." says Sid.

Glaucoma is the number one cause of preventable blindness in NZ, and we need to do whatever we can to stop its devastating effects. Early diagnosis is the only way to help prevent vision loss.

Please help support Sid in this challenging event, so that others who are challenged in a different way may have support too.

Any donation, no matter how big or small, is greatly appreciated - and remember anything over \$5 is tax deductible.

See Sid's fundraising page at: <http://www.givealittle.co.nz/cause/Glaucoma>

Public Meetings 2014

Glaucoma NZ's **free** public meeting programme is underway with meetings already held in Invercargill, Nelson, and Christchurch. These meetings are extremely popular and informative so plan to attend when there is one in your area.

Other locations on the 2014 itinerary include Hamilton, Greymouth, West Auckland, Orewa, Auckland Central, Whangarei, Palmerston North, Taupo, Havelock North, Auckland North Shore and Gisborne. Visit www.glaucoma.org.nz for details.

Glaucoma NZ members will receive personal invitations for meetings in their area.

These meetings are open to any member of the public wanting to know more about glaucoma – invite your family and friends to attend.

See you there!

New Year Appeal Saving Sight through Education

WE NEED YOUR HELP to maintain and extend our educational initiatives in an effort to reach all New Zealanders with vital information

- Public Meetings nationwide
- Community Group Presentations
- Information Resources including
 - **“Your Eyes”** a comprehensive booklet on glaucoma and general eye health
 - **“Putting in Eye Drops”** helpful tips card
- Eyelights Newsletters
- Continuing Education Programmes for Eye Health Professionals

Please help us to invest in a future without blindness from glaucoma.

THANK YOU for your continuing generosity - every donation counts!



YES! I would like to make a donation.

\$200 \$100 \$50 \$20 \$_____ (other)

Name _____

Address _____

_____ Postcode _____

Phone No _____ Email _____

I enclose my cheque made payable to Glaucoma NZ

Please debit my credit card Visa Mastercard

Name on Card _____

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Donations of \$5.00 or more are tax deductible and will be receipted.

YES! I would like to receive more information about:

- Donating on a regular basis by Automatic Payment
- Leaving a bequest in my Will to Glaucoma NZ
- I have already included Glaucoma NZ in my Will

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