

# EyelightS

The Newsletter of **GLAUCOMA NZ**  
TO SAVE SIGHT

## About Glaucoma New Zealand

Glaucoma NZ's Mayors for Sight awareness campaign is now organised throughout NZ to occur in the second week of August - the month of the Save Our Sight initiative organised by the NZ Association of Optometrists. Save Our Sight is aimed to inform our community about protective and preventative strategies in eye care that each of us can do to reduce the impact of vision loss in our community. Take note of what you see and hear in the media about eyes and eyesight during August. Glaucoma NZ is promoting glaucoma awareness through our Mayors for Sight campaign as part of this initiative.

Over sixty Mayors will have their eyes checked for glaucoma and Glaucoma NZ has organised widespread media coverage of the event as it occurs in each town and city. This is a first for NZ and we are thrilled with the cooperation received from optometrists, eye specialists, Lions clubs and not least the Mayors!

Mayors for Sight will emphasise that there is no simple test for glaucoma. Only an eye examination that includes testing the eye pressure, examining the optic nerve head, checking for glaucoma risk factors and testing the peripheral field, can adequately detect for early glaucoma.

## adidas Auckland Marathon

It's time to stretch those leg muscles, put on your Glaucoma NZ tee shirt, and start your preparations for Sunday 30th October! This year there is an event for everyone with a 5km walk as well as the 10 k, half and full marathon. So, if you are going to register for an event we would love to have you join us. In return for raising a minimum of \$50 sponsorship for Glaucoma NZ we promise you a fun day with



prizes and prezzies, sausages and sunshine (fingers crossed for the last one). This year we are having a team's event as well as individuals running or walking for us, so sign up your colleagues and challenge the Glaucoma NZ Trustees.

Contact Gael for a sponsorship form after registering at [www.aucklandmarathon.co.nz](http://www.aucklandmarathon.co.nz) Remember, your friends and family are welcome too.

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Inside this issue:

Focus on Research- Stem Cells and Glaucoma .....2

The Right Way Up- Yoga Do's and Don'ts .....3

Peter's Story .....4

You Don't See What You Don't See!.....5

Meetings, Meetings, Meetings!.....7

Questions for Your eye Care Professional .....8

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## Focus on Research - Stem Cells and Glaucoma

### Why would we need stems cells?

Damage to the retina or the optic nerve cannot be repaired and returned to normal using techniques available today. Although diseases that cause damage such as glaucoma can be readily detected and progressive damage can often be stopped by treatment, any sight lost cannot be regained. This is because the optic nerve and retina are formed out of central nervous system (CNS) tissue, and the CNS of adult mammals has very limited capabilities to repair itself.

So in this sense glaucoma is like other diseases that damage the CNS, such as Parkinson's disease or motor neurone disease. Stem cells hold potential to repair the damage caused by these diseases.

Using stem cells for repairing damaged eyes is a natural extension of earlier attempts to repair eyes by grafting retinal tissue. It's possible to surgically transplant retinal tissue and have it survive; the CNS doesn't have quite the same immune responses as other parts of the body, and so there's less difficulty with rejection as opposed to other transplants. The problem with this technique is that the graft never forms functional connections to the existing nervous system; it never gets 'plugged in', so to speak. However, work with stem cells suggest that there are reasons for being quietly optimistic about this new avenue of research.

### Where stem cells already work

The CNS of animals such as fish and amphibians show much greater capability to repair itself than in mammals. As fish grow, their eyes develop in part by production of new neurons from retinal stem cells. Damage to the retina can be repaired in the same manner, and some fish can regrow as much as half their brain if necessary. There is a

small but increasing amount of evidence that suggests the cellular machinery to regenerate CNS tissue from stem cells isn't simply missing from animals, it's just kept 'switched off' by a complex cellular messaging system. Researchers are exploring the signalling



pathways in fish, mammals and even insects in order to more fully understand what causes stem cells in the retina to grow, transform and be incorporated into a functioning tissue. Another possibility, apart from stem cells becoming functioning retinal cells, is that stem cells could stimulate the host tissue into repair or some other beneficial behaviour by signalling.

### The current state for human retinal stem cells

Human retinal stem cells have now been identified and isolated, and can be readily grown in the laboratory. These cells are capable of turning into any type of retinal cells. Additionally, stem cells from the spinal cord can grow into cells for a wide variety of tissues, including retinal cells. At this stage more research needs to be performed on how to grow these stem cells in the laboratory and control their transformations - unwanted transformations is one of the difficulties of dealing with these flexible cells.

Researchers at the University of Toronto have implanted human retinal stem cells into embryonic chicks and mice early in their development while their eyes are still growing. The human cells survived and were incorporated into the chicks' eyes as

the correct kind of cells. This shows that human retinal stem cells, if given the right environment and the right signals, will grow into healthy retinal tissue. Dr. Harry Quigley at the Wilmer Eye Institute has successfully incorporated stem cells into the retina of rats with artificially induced glaucoma. Interestingly, it appears that the new cells incorporate more readily rats with glaucoma than rats without the disease. However it's unclear so far whether the new cells actually help the animals see any better. This research is a long way from being useful for human patients at present.

### **Stem cells repair the drainage system**

So far we've focused on strategies involving the retina. Dr. Ernst Tamm of the University of

Erlangen-Nürnberg has decided to pursue an alternative strategy - to search for trabecular meshwork stem cells. The trabecular meshwork is the drainage system for the eye, and problems with this structure result in the high pressure found in eyes with glaucoma. Dr. Tamm hopes that his research will pave the way to restoring proper functioning to the trabecular meshwork through a stem cell therapy.

Research into the possibilities of stem cell therapies for glaucoma and other eye conditions is still in its preliminary stages. Any therapy resulting from this research will probably be at least 10 to 20 years away. However, the researchers in this area have high hopes for the future.

## The Right Way Up - Yoga Do's and Don't

Yoga enthusiasts tell us that yoga improves posture, increases the intake of oxygen, and enhances the functioning of the respiratory, digestive, endocrine, reproductive, and elimination systems. They highly recommend yoga for people in competitive, stressful working environments, for those who suffer from headaches, back and shoulder aches, allergies, and asthma.



The question is: should patients with glaucoma avoid inversion poses? And should these poses involving the head being lower than the body for an appreciable time be avoided completely, or limited to a certain amount of time?

A patient with progressive NTG turned out to have been doing yoga for 20 years standing on her head 20 minutes a day. Her eye pressure was measured when she was standing on her

head and it was 60 mm Hg. It was 30 in the supine position. She stopped standing on her head, slept on 2 pillows, and her glaucoma stopped progressing. A higher eye pressure is expected because of the increased blood pressure and venous drainage. However the change in blood supply to the optic nerve head is less certain.

Another patient, whose puzzling progression of field defects in both eyes despite IOP of 12 and 13 stopped progression when she stopped doing inversion postures as part of her daily yoga routine.

Regular yoga can be done without harm. However, until more research is carried out on the long-term effects of repeatedly assuming a head-down or inverted position on the optic nerve we would advise people with glaucoma to be cautious of undertaking these activities.

## Peter's Story

I recently met Gael during a wonderful trip to Great Barrier Island. Such are her persuasive powers that by the time the boat had docked back in Auckland she had persuaded both my girlfriend and me to run one of the events in the Auckland Marathon for Glaucoma NZ, and I had also agreed to write a short article for this publication about the injury that led to my case of glaucoma.

As a very active 30 year old, I guess I am a little bit unusual in suffering from glaucoma. Every time I visit the eye hospital I lower the average age of the folk in the waiting room significantly!

I have glaucoma in my right eye, caused by an eye injury. This injury happened on a typical Saturday morning, playing a typical game of squash at Glenfield Leisure Centre. I hadn't played my friend Cameron before and I realised quite quickly



after we started playing that I was going to give him a hiding! Cameron has an unenviable reputation for clumsiness (at least with me!) and this clumsiness was pretty evident on the court when he hit the ball into my back (and bum!) several times in the first few minutes of the game....I should have realised then that this particular game was not a good idea, but we carried on and I was pleased with the way the game was going... I played a shot into the back corner of the court and from where I was standing in the middle of the court I turned around to watch the result. Next thing I know I'm struggling to stay conscious. Cameron had hit the ball straight into my eye.

It was incredibly painful and my eye closed up with swelling almost immediately. I can

remember the strange looks I got when I was leaving the centre and I realised that my boyish good looks had taken a battering!

I visited a White Cross Accident and Medical Centre on the North Shore, but as they were getting no reaction to light from my eye, they sent me to the Eye Department at Auckland Hospital. Even at the hospital, there wasn't much they could do because the swelling around my eye was so bad, so I got sent home. A few days later I went back to the hospital for a follow up check and all seemed well. So it was back to work as usual, albeit looking like a prize fighter, thinking that it was all behind me.

Unfortunately, before long, my eye got very sore and I ended up back at the hospital. This time, within a few minutes of arriving I was whisked off to a bed and had an IV drip inserted in my arm, which was all very alarming as I had expected the nurse to tell me to stop being soft and to go home! Apparently the pressure in my eye was sky high and I needed to stay for a few days until the eye had settled down...

To cut a long story short, the result is that I have traumatic glaucoma in my right eye. It's now been 4 years since the injury and whilst I have tried to get off the daily drops on a few occasions, each time there have been problems and so I expect to be taking them for a long time yet! To be honest, apart from having to use the drops daily, having glaucoma has had very little impact on my life but I may need to use eye drops for the rest of my life. I am still playing squash but these days I wear protective glasses when I play. My advice for any other squash players out there is to wear these glasses – they are not expensive and although you might not look super cool they could save a lot of pain and hassle!



## You Don't See What You Don't See!

### The hidden effects of vision loss

What do you know about vision loss? It's not as simple as you might think! Read on so you can distinguish the facts from the assumptions and act now to prevent vision loss.

### You don't see what you don't see

Sometimes vision loss due to glaucoma is depicted as 'tunnel vision'. Gradually, over time, the sides of the image go dark so that only the centre is seen - surrounded by a ring



of blackness. But that's not truly what people with glaucoma experience.

Visual field loss does often start at the sides - with the peripheral vision. However, many people with glaucoma don't realize there is a loss of vision because they don't actually 'see' dark areas. There are no visible 'walls' of the so-called 'tunnel'. People with peripheral vision loss just have a narrower visual field. People with normal vision see images of their surroundings and have a naturally limited range of vision. They do not 'see' darkness all around them. People with glaucoma don't 'see' darkness either - they just see less of their surroundings.

Why is this important? Because glaucoma can steal your sight before you realize it's happening. Stick with your treatment and see

your eye doctor regularly to test your visual field and identify any damage to your optic nerve. With the tests available from your eye doctor, you should be able to understand and track any defects in your vision.

We use our periphery vision most for adapting to the dark and to detect moving objects. In addition, to keep both our eyes straight and looking in the same direction, the visual field of each eye must have a significant overlap. When there is insufficient overlap the eyes may drift apart and double vision may occur.

### You 'see' what you don't see

Glaucoma patients are often not aware of their loss of vision until the advanced stages of the condition. Researchers who study how the brain works have tried to explain this lack of awareness. One theory is that, when the retina or optic nerve is damaged, the area in the brain that processes visual input (the visual cortex) reorganizes the image it receives to mask the 'defects' in the visual field. In other words, the brain fills in the broken image so that what you see appears to be whole.



You may be familiar with this ability of the brain from experience with a 'blind spot' - perhaps when driving. This 'blind spot' is the area of the road behind and to the side of your car. Neither your sideview nor your rearview mirror reflects that portion of road, but your eyes and your mirrors may 'fool' you

into thinking you can see the whole road. Your brain makes assumptions in order to give you a more complete picture. It's a common phenomenon, but it also commonly leads to accidents on the road.

In the early stages of glaucoma, the brain may be able to form an image that seems complete. The brain may be able to 'complete' the image by filling in the missing parts with the colors and patterns of the surrounding areas. However, there are many situations where this 'filling in' can be hazardous to you and those around you. Let's continue with our



car example. If a dog, cat, or even a person walks in front of your car, you may not see them. But not only that — you may

not know that you're actually not 'seeing' that area of the road at all! If your brain fills in your blind area with surrounding input (color and texture of the road, curb, grass, etc.), how would you know that you're not getting the whole picture?

### **The impact of vision loss on your daily life**

Several recent studies have tried to measure the effect of gradual vision loss over time. Just as people with glaucoma don't see 'tunnel walls' or 'blind spots', they may not understand the effects that vision loss may have on daily activities and the rest of their health picture.

Vision is more than just acuity (the ability to distinguish details). Many people with glaucoma experience other visual difficulties that affect their lives every day. Several recent studies of people with glaucoma have shown that many aspects of their lives are affected by visual field loss, even when they are not aware of any changes in their vision.

- **Activities are limited**

Many people with glaucoma lose confidence in their ability to perform activities related to vision even before they report specific visual disabilities and long before they experience low vision or blindness. Of particular concern: glare, peripheral vision, and daily activities that involve adapting to light and darkness.

- **Falls more likely**

People who have visual field defects that their doctors can measure (whether or not the acuity - or sharpness - of their vision is changed) are more than twice as likely to experience a fall.

### **Take responsibility for your sight and your treatment**

Don't assume that you know how well you are seeing or that the vision loss you may be experiencing is part of the normal aging process. Your vision, your health, and your ability to enjoy everyday activities are far too important to risk with assumptions. Get the facts! And stick with your treatment plan.

Also keep in close contact with your doctor. Ask how he or she will check damage to both your visual field and your optic nerve over time (in addition to standard eye exams). Know your testing options and keep a record of the results.

### **Moving House?**

Don't forget to include Glaucoma NZ when you are doing your change of address cards. Remember, we have no way of knowing your new address if you don't tell us!

## Meetings, Meetings, Meetings!

### VENUES, DATES AND TIMES OF FORTHCOMING PUBLIC MEETINGS

Put a note in your diary or calendar now!

#### August 13th Auckland

10.00 am 27 - 33 Ohinerau St, Greenlane (Ohinerau St is opposite Novatel Hotel)

#### August 20th Te Puke

10.00 am St John's Ambulance Hall, Jocelyn St

#### August 20th Warkworth

10.00 am Totara Park Community Centre, Westpark Glen

#### August 27th Auckland North Shore

10.00 am Fairway Lodge, 7 Argus Place, Glenfield (behind North Shore Event Centre)

#### August 27th Timaru

11.00 am St Mary's Church Hall, Church St

#### September 3rd Whangarei

10.00 am Forum North, Rust Ave

#### October 15th Wellington

10.00 am St Johns in the City, cnr of Willis and Dixon St

### CHRISTCHURCH AND TAURANGA MEETINGS

The cold weather and rain did not deter over 300 people who attended our Christchurch Meeting at Boy's High School on the 11th June. After a presentation by Dr Ken Tarr and Dr Alan Simpson there were plenty of questions from the audience.

Dr Ken Adams and Dr Neil Murray shared the speaker's rostrum in Tauranga a few weeks later. Although their audience was smaller than at the Christchurch meeting their presentation was equally well received and appreciated. Dr Mike O'Rourke joined the speakers afterwards to answer questions from the audience.

## Contact Us with Your Questions & Comments

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I would like to become a member of Glaucoma NZ at no cost

I would like to donate \$ \_\_\_\_\_

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Donations of \$5.00 or more are tax deductible

I am interested in becoming a volunteer for Glaucoma NZ

I would like information on leaving a bequest for Glaucoma NZ

## Questions For Your Eye Care Professional

Glaucoma is a serious long-term medical condition. You should work with your eye doctor and his or her staff to get the information you need for successful treatment. Ask questions. Keep asking until you understand the answers. Ultimately, the decisions - and the responsibilities - are yours.

Make a list of the questions that you have right now, and bring the list to your next appointment so you'll remember what you want to talk about. If your list is very long you may want to ask some of the questions at a future appointment. Over time, you can find the answers to all of the questions you have about your condition and treatment.

Don't be embarrassed to say "I don't understand." Make sure you are comfortable with your eye doctor's answers before you leave the office.

Talk to the medical staff and the support personnel in your doctor's office. They can help with information, follow-up questions, and referrals to other services.

Attend a Glaucoma NZ Public Meeting if there is one in your area. There will be a chance for you to ask questions and also hear questions from other people who have glaucoma.

Take an active role in your eye care - you're looking out for your own future!

## The Trustees and Sponsors of **GLAUCOMA NZ** TO SAVE SIGHT

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