For years, glaucoma was defined as elevated pressure within the eye that leads to vision loss. And for years experts knew there were glaring gaps in that definition. Many people with abnormally high intraocular pressure never develop glaucoma. As many as one in three people who do get the disease have normal or even low pressure.

As researchers have tried to resolve those contradictions, a new paradigm for understanding glaucoma has emerged. Glaucoma isn’t simply an eye disease, experts now say, but rather a degenerative nerve disorder, not unlike Alzheimer’s or Parkinson’s disease.

“All three of these diseases affect aging populations and involve selective loss of certain populations of neurons,” said Dr. Neeru Gupta, a professor of ophthalmology and director of the glaucoma unit at the University of Toronto. “Parkinson’s affects motor control. Alzheimer’s affects cognition. Glaucoma disrupts vision. But the closer we look, the more they seem to have in common.”

Even the official definition of glaucoma, a disease that accounts for more than eight million cases of blindness worldwide, has changed.

Today, diagnosis is based on just two features: visible damage to the optic nerve, which leads from the retina at the back of the eye to the brain, and loss of peripheral vision, which can be measured by a simple test in an eye doctor’s office.

“Intraocular pressure is nowhere to be found in the definition, which shows you how the field has changed,” said Dr. Stuart McKinnon, an associate professor of ophthalmology and neurobiology at Duke University School of Medicine.
Researchers still recognize high pressure within the eye as a leading risk factor for glaucoma. And ophthalmologists still use the familiar screening test that shoots a puff of air at the front of the eye to measure pressure and screen for the disease. But since about 30 percent of people with the disease have normal or low pressure, there’s obviously something else at work.

What’s clear is that glaucoma begins with injury to the optic nerve as it exits the brain. The damage then spreads, moving from one nerve cell to adjoining nerve cells.

“In glaucoma, we’ve shown that when your retinal ganglion cells are sick, the long axons that project from the eye into the brain are also affected, resulting in changes that we can detect in the vision centre of the brain,” Dr. Gupta said. The phenomenon, called transynaptic damage, occurs in Alzheimer’s and Parkinson’s disease as well.

Experts are still deciphering what causes initial injury to the optic nerve. Although elevated intraocular pressure clearly increases the danger, some researchers suspect that steep fluctuations in pressure may be even more damaging.

“A structure in the optic nerve called the lamina cribosa is designed to act like a trampoline, going up and down in response to normal changing pressure,” said Dr. Rohit Varma, director of the glaucoma service at Keck School of Medicine at the University of Southern California. “But if those fluctuations become extreme enough, they may end up injuring the optic nerve.”

Another culprit may be perfusion pressure, or the difference between pressure within the eye and overall blood pressure. Low perfusion pressure occurs when pressure within the eye is high and systemic blood pressure is low. “When perfusion pressure drops, there’s not enough blood flow getting to the optic nerve and the retina,” Dr. Varma said. Lack of adequate blood flow may damage not only the optic nerve but also supporting tissues around it.

Then again, some people may have optic nerves that are simply more or less vulnerable to a variety of stresses, experts say.

That possibility has led to a search for drugs to protect susceptible nerves from injury. Several promising candidates are under investigation, including a drug called memantine (Namenda), which is now approved to treat Alzheimer’s, and riluzole (Rilutek), used to treat Lou Gehrig’s disease.

There is ongoing optimism that what works for one neurodegenerative disease, as these examples suggest, may be helpful for others. For researchers trying to understand the details of what goes wrong in such disorders, glaucoma may offer an easier model to study than a brain disease like Alzheimer’s. The optic nerve is the only nerve that can be examined visually, by peering through the pupil. And the visual system is a relatively compact structure that researchers already understand in great detail.

For now, the only treatments available for glaucoma work by lowering pressure in the eye, either by decreasing the production of fluid or increasing its outflow. Even in patients with normal intraocular pressure and early signs of the disease, lower pressure has been shown to significantly slow the progression of nerve damage. Most antiglaucoma drugs are delivered as eye drops, which may need to be used once or several times a day. When drops aren’t enough, laser treatments and surgery can be used to allow excess fluid to flow out of the eyes.

Despite effective treatments, many people suffer some preventable loss of peripheral vision. One problem is that the disease often goes undetected. About half of the estimated 2.2 million Americans with glaucoma are not aware that their vision is at risk because they have not been tested, surveys suggest. The longer the disease goes untreated, the greater the loss of vision. Worldwide, an estimated 60 million people have glaucoma, and that number is expected to reach 80 million by 2020.

Another hurdle is getting patients who know they have glaucoma to take their medicine. “Glaucoma is typically diagnosed before patients notice any vision problems” said Dr. Robert C. Cykiert, clinical assistant professor of ophthalmology at Langone Medical Center at New York University. “So telling them they could go blind if they don’t use their eye drops is like telling someone with high cholesterol that they could have a heart attack if they don’t take a statin. A lot of people don’t take the threat seriously enough.”

A 2003 study found that half of the patients in a health maintenance organisation never filled their initial prescription for eye drops. One in four patients failed to refill their prescriptions a second time, another survey found, even though eye drops need to used every day to be effective.

While scientists search for better treatments for glaucoma, the second-leading cause of blindness, people can take action to give themselves the best chance: get a regular glaucoma screening exam, and if glaucoma is diagnosed, take the treatment regimen seriously. Your sight depends on it.

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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:

There are different types of glaucoma, but they all involve damage to the optic nerve, 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.

Current treatments for glaucoma all aim to lower eye pressure.

Medication in eye drops can have side effects on other parts of your body. Tell your eye specialist.

People of all ages can get glaucoma. A family history of glaucoma means you are at much greater risk of developing glaucoma.

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. It relies solely on donations, sponsorship, grants and fundraising. All the information available to you from Glaucoma NZ is free.
Sunshine and Eyes

Can ultraviolet radiation from the sun damage my eyes?

Yes, just as ultraviolet (UV) radiation can damage your skin, so eyes can be damaged from sun exposure. Strong sunlight can burn the corneas and conjunctivas of your eyes – long term exposure can contribute to eye disease, especially cataracts, eyelid skin cancers and possibly macular degeneration.

There are a number of sunglasses available to purchase. I am confused as to what to look for when choosing a pair. Can you help?

Here are some tips on what to look for when purchasing sunglasses:

- **UV Block.** Ideally, sunglasses should block the two components of UV radiation – UVB and UVA – by 99% and 95% respectively. Even if the lens glass is dark, untreated plastic lenses do not adequately block UV radiation. Always check if the sunglasses block UV light.

- **Blue-blocking plastic lenses (yellow lenses).** These are often promoted for sun protection and also block red, amber and blue light. This makes it difficult to discriminate traffic light colours.

- **Polarised lenses.** These lenses protect against glare but do not meet the criteria for UV protection unless they have additional UV-blocking material in the lenses. Polarised lenses are best for reducing glare but can cause distortion of light when looking through a partially polarised window or car windscreen when darker patches occur in the plastic or glass you are looking through.

- **Photochromic lenses.** These lenses change in level of darkness depending on the light. This type of lens protects the eyes from glare, sun and UV radiation while also maintaining vision. In addition, photochromic lenses do not distort colour.

  - **Impact resistant/polycarbonate (plastic).** No lens is truly shatterproof. Plastic lenses are less likely to shatter upon impact than glass lenses. Polycarbonate plastic, used in many sports sunglasses, is even more impact resistant than regular plastic, but scratches easily. If you buy polycarbonate lenses, look for ones with scratch-resistant coatings.

  - **Lens Colour.** This is much less important than you may realise. Blue lenses are best avoided as they let through the short wavelengths you want to protect your eyes from. Brown and grey shades are usually best. It depends on your personal choice. Green and red lenses don’t offer any advantages. Standard clear glasses can also be treated with a material that absorbs UV radiation. UV protection can be obtained for most rigid contact lenses and many soft contact lenses.

  - **Fit-over’s.** These are sunglasses that can be worn over your regular prescription glasses and they often provide the wrap-around feature.

  - **Wrap-aroounds.** Sunglasses that wrap around the temples prevent the sun’s rays from entering from the sides. Wrap-arounds offer added protection.

**General tips for sunglasses.**

- **A high price is not always a guarantee of high quality and protection.**

- **Designer and fashion frames do not necessarily add to eye protection.**

**The best sunglasses are the ones you actually wear.**

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Out & About

Fiji Mission - Marine Reach

In July this year, Ophthalmologist and Glaucoma NZ Trustee Dr Mike O’Rourke from Tauranga and Optometrist Nigel Weir from New Plymouth volunteered for a mission trip on Marine Reach’s medical ship Pacific Link, to serve the outer islands of Fiji.

Visiting Vanuabalavu and Lakeba, at the far east of Fiji’s main island, these poor communities are far from healthcare facilities. Eye services in these far flung places are nonexistent, making the visits from the Marine Reach ship absolutely vital to the communities whose lives are so remote.

The Pacific Link is run as a missionary outreach of the charitable trust Marine Reach. All staff and crew of the ship are volunteer workers and are self funded. This allows an entirely free service to the communities that are visited around the Pacific Islands. On this particular trip 518 people were examined and helped, with 389 pairs of glasses given away, of which 118 pairs were prescription glasses matched to the patient from an extensive database of donated spectacles. Nigel Weir worked long and exhausting hours running optometry clinics in remote villages under less than ideal conditions.

Mike O’Rourke spent the majority of his time onboard the Pacific Link, with ophthalmology clinics and surgery in the ship’s operating theatre. Fortunately the weather was calm enough but microscope surgery in a ship with a rolling deck has its challenges! 72 eye surgery operations were completed by the team - mostly cataracts and huge pterygiums. The bulk of the surgery consumables were donated by companies in New Zealand and Alcon, a sponsor of Glaucoma NZ, kindly donated a Phaco machine for the cataract procedures.

Eye surgery and optometry were not the only contribution made by the ship’s company. The engineering team and electrician repaired generators, outboard motors, lawn mowers, washing machines and more. A health care team visited numerous villages with primary health care but unfortunately there was no GP on this trip as there usually would be. A construction team built 8 concrete water tanks in the villages and worked on water supply and drainage systems.

The Marine Reach ship has its administration offices in the city of Tauranga - its home port when not in the islands. Marine Reach is part of ‘Youth with a Mission’ - one of the largest missions organisations in the world. They would welcome support and volunteers for future trips. Lay people, professionals, doctors, optometrists, nurses and those wanting to lend a hand are all welcome. Mike O’Rourke took his 19 year old son along, who was able to help in the clinics and with building the water tanks! Everyone can contribute to the wellbeing of these remote communities.

If you would like to assist contact Marine Reach through [www.marinereach.com](http://www.marinereach.com) or email: [medical@marinereach.com](mailto:medical@marinereach.com)
Thank You!

Glaucoma NZ would like to thank all those who supported the July Annual Awareness Appeal.

Over 170 optometrists, ophthalmologists and pharmacies around the country participated by taking donation boxes, with many also donating $1 to GNZ from every eye examination during the Appeal month.

A large amount of media exposure was generated from the joint efforts of GNZ and supporting participants with articles appearing in a variety of national magazines and newspapers, together with local papers.

Streamlining the appeal

GNZ’s 0800 advisory line ran hot with queries from members of the public – many of them mentioning various articles which had prompted their calls. A large number of these callers were subsequently advised to visit their local optometrist for an eye examination.

The Appeal overall has been a great success, raising awareness of glaucoma to a new level with a call to action and boosting funds.

Again, Glaucoma NZ appreciates all your efforts and we are looking forward to making July 2010 even bigger and better with your support.

Sunday Star Times

July 19th 2009

Watch out for your eyes

Karen Tay explains what you can do to protect one of your vital senses.

IF YOU had to choose between losing your eyesight or one of your other faculties, what would it be?

Think about never again seeing the faces of loved ones, a glorious sunset or never driving through New Zealand countryside again and you’ll understand how much you actually have to lose.

It’s a hypothesis that could easily become reality if you’re diagnosed with the eye disease glaucoma.

“Glaucoma is completely asymptomatic, that’s why we call it the ‘silent thief of sight’, says Professor Helen Danesh-Meyer, chair of Glaucoma New Zealand, a charitable organisation which aims to raise public awareness of the disease.

It’s the leading cause of preventable blindness in New Zealand and an important cause of visual loss.”

Danesh-Meyer, who is also an ophthalmologist and eye surgeon specialising in glaucoma, says the main issue to be aware of is that the disease can creep in so slowly and insidiously that people may start realising the extent of their blindness only once it’s irreversible.

“Their vision goes slowly in patches but they learn to work around it. (In one patient) by the time it was diagnosed, it was so severe that I had to tell them they were not legally allowed to drive anymore.”

At least 50% of New Zealanders who have glaucoma have not yet been diagnosed. In layman’s terms, glaucoma means there is a plumbing problem. The eye has a self-sufficient system that produces and disposes of fluid that lubricates your eyeball. In glaucoma, the eye becomes suddenly unable to drain the fluid it produces properly, resulting in a slow build-up that will start to push on the optic nerve at the back of the eye – what eye doctors like to call “the nerve of sight”.

“In glaucoma, the pressure pounding away at that optic nerve causes damage to the nerve cell. As it damages the nerve cells, it causes constriction and loss of vision. Slowly it becomes tighter and tighter, like tunnel vision. In the end people are left looking through what looks like a little pinhole.”

Danesh-Meyer emphasises that glaucoma is manageable, if diagnosed early enough, by special eye drops, although these have to be used for the rest of your life.

The drops work on two ways – either helping drainage out of the eye, or slightly decreasing the amount produced, so the eye doesn’t have to deal with as much fluid.

Asked if there were genetic predispositions to the disease, Danesh-Meyer said it was important to mention to optometrists if there was a family history. “If you have glaucoma, tell your family members to get checked too. It’s actually highest if a sibling has it, although we don’t know why yet.”

Family history of glaucoma can increase your chances of getting it tenfold.

A glaucoma check is not a routine eye exam and you have to specifically request it from your optometrist. It involves a test of your peripheral or side vision, examining the back of your eye and a pressure check.

Although cancer does not increase your chances of getting glaucoma, age, short-sightedness and diabetics with high blood pressure are at higher risk of developing the disease.

Danesh-Meyer recommends the 45 plus five rule when it comes to glaucoma checks. Make an appointment with your optometrist and ask for the test when you turn 45, and if everything looks normal, book in every five years for a repeat of the same.

Although glaucoma can strike at any age (even babies can get it, it’s called congenital glaucoma), there are some things you can do to reduce the chances.

Living a healthy lifestyle, including eating well and doing at least 30 minutes of cardio exercise three times a week, has been shown to help reduce the pressure on the eye.

People who suspect they may have weaker optic nerves (such as if you’re short-sighted) can also look at the type of activities or hobbies they do, some of which may result in glaucoma.

“We know that there are some risk factors. For example, people who do yoga are, interestingly, at high risk.

If you have glaucoma and do the position where you stand upside down, that can increase the pressure in your head.

“I had a patient who played the bagpipes all day and, again, that could increase the pressure.”

But when it comes to glaucoma, early detection is key to preventing blindness. The visual loss caused by the disease is irreversible.

“Studies show that people go blind for two reasons. One is that they’re diagnosed late and the second is that they don’t use their drops.

“If someone comes in and they’ve lost 70% of their sight, then I can only save 30%. It makes it that much more difficult to keep them from going blind.”

(GNZ note that the above article emphasises the treatment for early glaucoma and that eye drops are all that is needed in over 90% of glaucoma patients. However surgery is also an option to be discussed with your specialist).
**Reader’s Story**

**The Cactus**
By Geoff Parr

For years I had been fascinated by cactus. They are unusual and varied in form, and very tolerant to a lack of attention from time to time - all in all great plants for blokes.

Over the years the collection grew to a number approaching 50 specimens, and the little darlings also became taller and taller.

One of the attractions of cactus is that they can normally be chopped down, and replanted with good regrowth prospects.

One Saturday morning in June 1994, I decided that it was time to reduce the height of one of my favourites. I took the carving knife from the kitchen, and with a swift blow, promptly decapitated the plant in question. What I did not realize at the time was that my chosen pruning method. A few minutes later I was in excruciating pain. The cactus milk in my eyes felt like someone was pouring hot oil into them.

I was rushed to the eye clinic at Auckland Hospital where I received the required care. The positive side to all of this is that as part of the tests the specialists undertook, they discovered that I had the signs of developing glaucoma later in life!

Over the following years I went through the process of trying to find what eye drops would get the pressures in my eyes to an acceptable level, without unwanted side effects. It feels like I must have tried them all. I am happy to report that we have found a combination that is doing the business nicely, which I will be taking every morning and night, for the rest of my life.

I do have some "non painful" side effects which I have accepted as the price I must pay to see the sun rise in the morning, and the smiles on peoples faces.

I have eye lashes that most females would die for, and a darkening of the skin around the eyes. Some people comment on this, but most just give you a polite enquiring stare, whilst they try to work out what is different about my appearance. This is most noticeable at the supermarket checkouts!

My specialist has been very supportive over the years and recently made a comment that I have accepted as the price I must pay to see the sun rise in the morning, and the smiles on peoples faces.

Not possible I thought as I was only 32 years old? If I hadn’t had the accident, I might never have known I had the condition, until it was too late. The damage being irreversible!

Further conversation with my family revealed that there was a history of glaucoma on my mother’s side that I had not previously been aware of. From that day onwards I have had regular tests to monitor the condition of my eyes. The tests were all positive until June 2006 when my specialist noticed some changes in my optic nerve – some 12 years after my initial accident.

The positive side to all of this is that as part of the tests the specialists undertook, they discovered that I had the signs of developing glaucoma later in life!

The first study evaluated the increase in eye pressure that occurs when one litre of water is ingested over 15 minutes. They evaluated the effect of this on the eye pressure in two groups of patients: glaucoma patients who are using eye drops and glaucoma patients who have had glaucoma surgery (trabeculectomy). The results demonstrated that despite a baseline eye pressure of 11 mmHg, patients who were well-controlled on glaucoma medication had an average increase in their eye pressure of 5 mm Hg, or an increase of 56% within one hour in patients treated with eye drops, and 13% in patients who had surgery.

A follow-up study using 500 ml of fluid showed a rise in eye pressure of 23% within an hour.

The practical recommendation from these studies is that it is best to spread your water intake throughout the course of the day rather than drink it all quickly!

**New Trustee for Glaucoma NZ**

Glaucoma NZ is proud to announce the appointment of Mr Harold Titter to the Board of Trustees.

Harold has a Bachelor of Commerce Degree and is a retired Fellow Associate Chartered Accountant. He was awarded the “Companion of the Order of St. Michael and St. George” in 1990 and an Honorary Doctorate from the University of Auckland in 2001.

Formerly a Chartered Accountant in practice with experience in London, Malaysia, New York and New Zealand, Harold later became the Managing Director of Feltex New Zealand Ltd. Also Commissioner of the Auckland Area Health Board, Secretary of Defence, Councillor and Pro-Chancellor of the University of Auckland, Chairman of the Northern Regional Health Authority and a member or director of a number of special Government and local authority committees and public and private companies.

Harold, who has glaucoma, is looking forward to using his extensive expertise to help the Glaucoma NZ team continue their vital work.

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**Readers Story Contributions**

If you would like to share your glaucoma story with readers, we would love to hear from you. Please email, post or fax your story to Glaucoma NZ, attention Eyelights Editor.
Activation of the sympathetic nervous system prepares the body for “flight or fight”. Some cough medicines contain sympathetic stimulants such as phenylephrine. In addition to drying up respiratory secretions this drug may dilate the pupil slightly. In susceptible folk with narrow angles this may rarely cause angle closure glaucoma. If you have open angle glaucoma, you need not worry about such medications. If you have narrow angle glaucoma your doctor has already taken steps to prevent the angles from closing either with a peripheral iridotomy or a cataract operation. So if you are worried about the possibility of cough meds making your glaucoma worse you need not worry.

Suggested ways you can help Glaucoma NZ help you:

- Continuing 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.
- Purchase an Entertainment™ Book.
- Suggest to your work colleagues that they hold a special day or event to support our charity.
- Think of us when preparing or updating your Will.
- Tell everyone about Glaucoma NZ and its services.

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 Meetings

Over 1,000 people have attended the free Glaucoma NZ public meetings this year. To date meetings have been held in Tauranga, Hamilton, Nelson, Dunedin, Auckland – north, central and east, Kapiti Coast, Christchurch, Palmerston North, and Orewa.

Upcoming Meetings:
- 7th November – Whangarei – 10am
- 28th November – Napier – 10am
- 5th December – New Plymouth – 10am

These meetings are open to any member of the public. Visit www.glaucoma.org.nz for details of future meetings.

Glaucoma NZ Professional Education Programme

Since 2004 Glaucoma NZ has been supporting the eye health workforce by providing an on-line case based programme which contributes towards ongoing competency.

GNZ is pleased to congratulate all those who participated in the 2009 programme and successfully passed the examination.

Enrolments for the 2010 Professional Education Programme will open in February. Further details will be available on the GNZ website www.glaucoma.org.nz at that time.
Christma Research Appeal
Finding a Cure

PLEASE support us in our efforts to fund research into new and improved treatments for the 68,000 New Zealanders living with glaucoma.

Ongoing research and development play an extremely important role in the treatment of glaucoma and ultimately finding a cure. Our goal is to raise $50,000 each year to specifically dedicate to worthwhile research projects in New Zealand.

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

THANK YOU - every donation counts!

YES! I would like to make a donation to support research.

☐ $100  ☐ $50  ☐ $30  ☐ $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 ________________________________

Card No ________________________________

Expiry Date ____ / _____  Signature _______________________

☐ YES! I would like to make an extra gift of $10 and receive 3 of Glaucoma NZ’s special promotional Lens Cleaning Cloths.

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

The Trustees of Glaucoma NZ

Professor Helen Danesh-Meyer (Chairperson)

Dr Mark Donaldson

Dr Mike O’Rourke

Gordon Sanderson (Deputy Chairperson)

Harold Titter

Auditor WHK Gosling Chapman

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Moving House?
Don’t forget to advise Glaucoma NZ of your new address.