



*We Support New Ideas*

# Glaucoma Research Society of Canada

## News & Information

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## Congratulations Michael Claener! Former GRSC President Awarded One of Canada's Highest Honours



The Governor General of Canada recently awarded Michael Claener the *Meritorious Service Decoration* for his extensive services to the Glaucoma Research Society of Canada and his many other charitable good works.

Over the course of a decade starting in 1990, Michael helped grow the Glaucoma Research Society, a small Ontario-based group with few members, into a national organization. He also helped raise significant funds for The Rouge Valley Health System, allowing it to buy new hospital beds and replace aging, outdated equipment. As well, Michael helped young people hone their job finding and interview skills.

### Glaucoma At-Home Self-Testing Matches In-Office Methods

Findings from a pilot study assessing the feasibility, accuracy, and repeatability of unsupervised, at-home, multi-day glaucoma testing using the Olleyes VisuALL Virtual Reality Platform (VRP) and the iCare HOME handheld self-tonometer suggest that at-home remote glaucoma monitoring correlates with in-office testing.

At-home testing might in the future provide additional information for managing glaucoma. It noted though that patients had more difficulty with the iCare HOME pressure measuring device than with the VRP.

***Translational Vision Science & Technology***  
**July 2024**

### Screening Needed for Diabetic Patients with Glaucoma

Results from a large global database study show a substantial association between primary open-angle glaucoma and the development of diabetic retinopathy (DR) in patients with type 1 and type 2 diabetes mellitus.

The findings emphasize the need for vigilant screening and comprehensive management to lessen the risk of DR in patients with glaucoma and diabetes.

The study suggests that future research delve into clarifying the underlying mechanisms driving these associations.  
***Ophthalmology* July 2024**

## President's Message



I'm pleased to let you know that the Society is having another successful year in raising funds, making research grants, and increasing awareness about issues relating to glaucoma through its

newsletters, website, and webinars.

This year the GRSC awarded a total of \$359,393 in grants for 15 research projects. This included \$5,000 for the *Mel Mitzel Annual Research Excellence Award*, presented to Dr Ellen Zhou of the Department of Ophthalmology & Vision Sciences, University of Toronto.

These research grants are only possible thanks to your generous donations. Last October the Society raised nearly \$45,000 during the Toronto Waterfront Marathon. This October we hope to raise even more during our annual **Walk for Research**. Look for details on the insert in this newsletter.

We've also updated our website to make it easier for you to donate. Be sure to check out our **How to Help – Charitable Options** page for some giving options you may want to explore.

On behalf of the Board of Directors, I would like to invite you to attend our virtual Annual Supporters' Meeting on Thursday, October 17 at 7 p.m. at which Dr. Michael Balas will present the *14<sup>th</sup> Annual Albert Waxer Lecture on Understanding the Side-Effects of Glaucoma Medications: A Focus on Prostaglandins*.

Following his lecture, Dr. Balas will join some of Canada's leading glaucoma specialists to answer your questions live! We hope that you can join us, but if you can't, you'll be able to watch the entire meeting on our website later.

**James M. Parks, President**

## SLT as Effective as Medical Therapy to Control IOP

A recent study showed selective laser trabeculoplasty (SLT) to be as effective as medical therapy in intraocular pressure (IOP) control. SLT was also associated with significantly decreased rates of glaucoma surgeries, anti-glaucomatous medications, and ocular adverse effects.

These findings support SLT as a safe and effective treatment for open-angle glaucoma or ocular hypertension.  
*Journal of Glaucoma July 2024*

## Relaxation Techniques Seem to Reduce IOP

A recent review of literature concluded that various relaxation techniques, such as meditation, visual imagery, and body and eye relaxation exercises, seem to cause significant reductions in intraocular pressure (IOP).

Future randomized, controlled trials should be carried out to further explore their usefulness for patients with glaucoma.  
*Canadian Journal of Ophthalmology August 2024*

## Exercise May Benefit Glaucoma Severity and Progression

Raised intraocular pressure (IOP) is the most important risk factor for glaucoma. Exercise is known to result in changes in IOP.

A review of 16 original studies found that moderate-intensity aerobic exercise results in transient reductions in IOP and that daily physical activity and exercise may have a beneficial effect on glaucoma severity and progression. Further longitudinal studies are required to validate this.  
*Journal of Glaucoma June 2024*



**Dr. Rajiv Bindlish  
Answers  
Your Questions  
about Glaucoma**

**My doctor used a virtual reality (VR) headset to test my visual field. Is this a valid way of testing?**

Companies are reprogramming existing VR headsets to test for visual field deficits. Patients seem to like using them, as they're easy to handle and more comfortable than traditional visual field-testing devices. However, the headset programs now being tested may underestimate glaucoma damage. They do not currently replace our gold standard of automated visual field testing with either a Humphreys or Octopus device.

I expect that future improvements in VR technology will allow patients to easily test for visual field defects and glaucoma progression more often than currently done during their usual once or twice a year office visits.

**I drink 3 to 4 cups of coffee a day, but recently read that drinking coffee can raise my eye pressure or cause glaucoma. Is this correct?**

Some studies show that some patients with more advanced glaucoma consume higher amounts of coffee. Other studies show some protective effects from coffee or caffeine. Most studies have limitations and other factors that are often not included in summaries of their findings.

Anything in moderation is likely not harmful. The risk from drinking excessive amounts of coffee may also be related to the volume of liquid consumed. Consuming a large cup (e.g. a litre) of any liquid quickly, may cause eye pressure elevation.

**Are there any vitamins I can take to prevent or protect me from getting glaucoma?**

Unfortunately, no vitamins will protect you from getting glaucoma, although some are being used for macular degeneration or dry eyes. The most important way to protect yourself from getting glaucoma is through regular eye examinations.

**One of the eye drops I use requires dosing three times a day. I often miss the mid-afternoon dose. How can I improve on managing this?**

Non-compliance with eye drops is one of the main reasons that glaucoma worsens. Some medications require an extra dose to maintain IOP's lowering effect throughout the day. You can mark off on a calendar or in a journal the time when you administer each drop. Or try a smartphone app that rings your phone when it's time to take your medication.

**Will cataract surgery worsen my glaucoma? Are there risks involved with having the surgery?**

The risk of glaucoma worsening depends on how advanced it is. For mild or moderate glaucoma, the risk from cataract surgery may be minimal. Sometimes cataract surgery lowers eye pressure over the long run and may help control your glaucoma.

If you have more advanced glaucoma, it may worsen if your eye pressure remains elevated for a prolonged period after the cataract surgery. Your doctor may need to lower this risk by addressing the glaucoma first. They may combine your cataract surgery with a minimally invasive glaucoma procedure to help control eye pressure.

**Email Your Questions  
about Glaucoma to:**

**[info@glaucomaresearch.ca](mailto:info@glaucomaresearch.ca)**



# GLAUCOMA RESEARCH SOCIETY OF CANADA AWARDED \$359,393 IN GRANTS TO 15 RESEARCH PROJECTS IN 2024

## Establishing the Canadian Pediatric Glaucoma Consortium to Study PCG Genes

Primary congenital glaucoma (PCG) is a severe early-onset form of glaucoma that mainly affects males. Its prevalence in Canada is uncertain. This project calls for a collaborative effort among pediatric ophthalmologists, glaucoma specialists, and ocular geneticists to establish a Canadian Consortium, focusing on inherited forms of childhood glaucoma.

This study will investigate the genomic makeup of PCG in Canada. It will identify inequities, examining how PCG patients are distributed across Canada and explore the prevalence of genetic causes related to laterality, sex, gender, ethnicity, consanguinity and socioeconomic background.

Identifying inequities will guide patient-centered care for Canadian children, and the strict inclusion of participants using the Childhood Glaucoma Research Network guidelines will foster international collaborations. By studying variant distribution among PCG genes, researchers may uncover previously unknown PCG-related genes.

***Dr Ellen Zhou, University of Toronto, Toronto ON; Johane Robitaille, Marcelo Nicolela, Dalhousie University, Halifax, NS***

## Investigating Self-Reported Glaucoma in Canada

In Canada, there isn't enough data about how many people have glaucoma. Researchers often use self-reported questionnaires to study glaucoma prevalence because they're easy, quick, and cost-effective. However, relying solely on self-reports has its challenges. People may misunderstand medical terms, forget

details (recall bias), or feel pressure due to social issues (like the fear of losing their driver's license).

This study will compare the accuracy of self-reported glaucoma information to clinical assessments. The researchers will analyze data from the Canadian Health Measures Survey, which includes both self-reported questionnaires and clinical eye exams conducted in mobile clinics between 2016 and 2019. The results of this study will help determine the value of using self-reported questionnaires to study glaucoma in Canada.

***Yaping Jin, Dr Yvonne Buys, Dr Ziad Butty, University of Toronto, Toronto ON***

## Studying the Effects of Age on Retinal Ganglion Cells

Researchers are studying how age affects the function of retinal ganglion cells (RGCs). Earlier research highlighted the influence age has on experimental models of RGC degeneration. Despite age being one of the most influential risk factors for glaucoma development and progression, most research is performed in younger mice which is not representative of human disease.

In this study, the research team will induce glaucoma in both adult and old mice. They expect that equal elevations in intraocular pressure will cause greater RGC loss in the older mice group.

Results will provide evidence to support using aged animals to study age-related diseases. Determining differences between adult and old animals and their response to diseases like glaucoma could be critical when designing treatments and preclinical trails for humans.

***Delaney Henderson, Dr. Balwantray Chauhan, Dalhousie University, Halifax NS***

## **Comparing a New Approach with Traditional Eye Drops for Care After Glaucoma Surgery**

This study proposes a new way to care for patients after glaucoma surgery. Researchers suggest using a steroid that ophthalmologists often prescribe for other purposes. Instead of following a strict eye drop schedule, patients will receive a higher dose of this steroid directly to the eye.

This approach might lead to similar or even better post-operative outcomes, without the negative effects of frequent preservative-containing eye drops.

***Devin Betsch, Dr Marcelo Nicoleta, Dr Lesya Shuba, Dr Brennan Eadie, Dr Paul Rafuse, Kevin Hodgson, Dalhousie University, Halifax NS; Dr Matthew Palakkamanil, University of Alberta, Edmonton AB***

## **Investigating Eye Rigidity & Vision Complications After Glaucoma Surgery**

Glaucoma filtration surgeries can lead to a serious complication called hypotony maculopathy (HM), which may cause permanent vision loss. This study explores the relationship between ocular rigidity (a measure of eye stability) and post-operative HM.

The study hypothesizes that eyes with lower ocular rigidity (while controlling for intraocular pressure) are more likely to develop hypotony maculopathy. If results show a significant correlation, measuring pre-operative ocular rigidity could help predict which patients are at greater or lesser risk for HM.

This information would allow for modifying surgical approaches, maximizing patient outcomes. For example, a nearsighted patient with normal tension glaucoma might benefit from personalized surgical adjustments based on their ocular rigidity levels.

***Dr Mark Lesk, Dr Santiago Costantino, University of Montreal, Montreal QC***

## **Research Grant Renewal Enhancing Quality of Life Through Meditation & Breathing Exercises**

Glaucoma patients often experience a reduced quality of life due to the stress associated with vision loss. Research has shown that practicing meditation and engaging in breathing exercises can alleviate stress and enhance overall well-being for many glaucoma patients.

With this grant, the team will continue their research with an electronic feasibility study. Participants in the randomized controlled trial will complete 12 weeks of breathing exercises followed by meditation, facilitated virtually by experienced instructors. The study will analyze data collected after in-person follow-up clinic visits at the Ivey Eye Institute at Western University.

***Monali Malvankar, Dr Cindy M.L Hutnik, University of Western Ontario, London ON***

## **Assessing Uveolymphatic Outflow in Glaucoma**

The eye's intraocular pressure (IOP) is regulated by the aqueous humor. This fluid drains through two pathways: the well-studied trabecular meshwork pathway and the less understood uveoscleral pathway. Recently, lymphatics were discovered in the ciliary body of the eye, suggesting they play a role in uveoscleral drainage.

In this study, researchers will investigate whether the uveolymphatic drainage of aqueous humor is affected in a mouse model of glaucoma. They will use non-invasive imaging techniques to directly and quantitatively assess the flow of aqueous humor through the uveolymphatic drainage pathway. Results of this study will help researchers understand how uveolymphatic outflow contributes to IOP and glaucoma. These findings may inspire new therapies targeting the uveal lymphatics.

***Dr Yeni Yücel, Dr Neeru Gupta, Unity Health Toronto, St. Michael's Hospital, Toronto, ON***

## **Investigating Glaucoma Risk in Heart Disease Patients Using CCBs**

Calcium channel blockers (CCBs) are commonly prescribed cardiovascular medications in North America. This study will re-examine the link between CCBs and glaucoma, addressing methodological limitations that may have influenced previous findings.

Expected results include: the risk associated with CCBs will be higher than that of angiotensin converting enzyme inhibitors (ACE-Is) or thiazide diuretics; non-cardio-selective CCBs will pose a greater risk of glaucoma than cardio-selective agents; the risk of glaucoma will increase with longer CCB usage; and women using CCBs will face a higher risk of glaucoma compared to men. The results will help clinicians, patients and policy makers make informed decisions on the potential risk of CCBs with glaucoma.

***Mahyar Etminan, University of British Columbia, Vancouver BC; Dr Bonnie He, Dr Brennan Eadie, Dalhousie University, Halifax NS; Gareth Leung, University of Ottawa, Ottawa ON***

## **Developing an International Pediatric Glaucoma Biobank**

Pediatric glaucoma research lacks comprehensive knowledge about the cytokine profiles within the eye. To address this critical gap, this project proposes creating an International Pediatric Glaucoma Biobank. This biobank will systematically collect biospecimens, data, and images related to pediatric glaucoma. Doing so will stimulate biomarker discovery and enhance understanding of this condition.

Analyzing cytokine biomarkers from the biobank will be a significant step forward. It will help doctors manage pediatric glaucoma better and explore potential links between intraocular cytokine levels, structural complications, and visual outcomes after treatment.

***Dr Helen Dimaras, Asim Ali, Kamiar Mireskandari, Ashwin Mallipatna, Crystal Cheung, The Hospital for Sick Children; Rajeew Muni, St. Michael's Hospital; Toronto ON***

## **Research Grant Renewal POAG Molecular Changes**

Researchers are studying the molecular changes associated with primary open-angle glaucoma (POAG). Previous studies have identified specific alterations in signaling pathways related to this condition. With this renewed grant, researchers will analyze patient data using advanced bioinformatics techniques. Their goal is to gain valuable insights into the biochemical pathways involved in POAG progression.

***Dr Tianwei (Ellen) Zhou, Dr Jeremy Sivak, Department of Ophthalmology & Vision Sciences, University of Toronto, Toronto, ON***

## **Comparing Health Education & Meditation for Patients with Irreversible Age-Related Vision Loss & Their Caregivers**

One out of every four Canadians aged 75 and older will experience irreversible age-related vision loss (IARVL). This condition impacts their ability to care for themselves, requiring support from caregivers. Alas, caregiving often leads to high stress and anxiety levels among caregivers.

IARVL is linked to elevated inflammation and cortisol dysregulation, which can harm the vascular and sympathetic nervous systems. Nervous system damage may contribute to conditions like glaucoma and optic neuropathy, which can lead to complete vision loss. However, mind-body interventions, such as meditation, can trigger a relaxation response that reduces stress and enhances overall quality of life.

This study will assess the feasibility of providing meditation to glaucoma patients with IARVL and their caregivers. It will also investigate whether meditation improves health-related quality of life, reduces depression and anxiety, enhances sleep quality, and lessens caregiver burden when compared to a health enhancement program.

***Monali Malvankar, Dr Cindy M.L. Hutnik, University of Western Ontario,***

## Studying PXF Fibrils in the Eye

In pseudoexfoliation (PXF) syndrome insoluble protein aggregates form in the eye. These fibrils can clog the trabecular meshwork, which affects fluid drainage and increases intraocular pressure, raising the risk of glaucoma.

PXF glaucoma is the most common cause of open-angle glaucoma. Currently no preventive treatments are available. Researchers are exploring a novel approach using targeted magnetic nanoparticles and an alternating magnetic field. This technique aims to break down PXF materials, allowing the eye's natural processes to clear them. The study will test this method using samples from cataract surgery patients' lens capsules. If successful, this research could lead to a potential treatment for PXF glaucoma.

**Jessica Chin, Larry D. Unsworth,  
University of Alberta, Edmonton AB**

## Investigating Vision Changes & Low IOP Rates After Glaucoma Surgery

This research project aims to review all studies related to vision changes in patients who have undergone Trans Scleral Cyclophotocoagulation (TSCPC). It will also analyze studies that report rates of low intraocular pressure (IOP) in patients with refractory glaucoma who have also undergone TSCPC.

The expected results from this review include identifying significant differences that might have otherwise been overlooked in individual studies. Researchers will use the Grading of Recommendations, Assessment, Development, and Evaluation system to assess the quality of evidence for all outcomes and evaluate the risk of bias. If needed, they may also employ The Risk of Bias in Non-randomized Studies of Interventions assessment tool.

**Chris Zajner, University of Western Ontario, London ON; Michael Balas,  
Dr David Mathew, University of Toronto,  
Toronto ON**

## Measuring Immune Response in Retinal Ganglion Cell Loss

In glaucoma, the cells that die are retinal ganglion cells (RGCs). The most common approach to protect RGCs is to reduce intraocular pressure.

Previous studies used different animal models to induce RGC death. However, understanding the immune response to these models remains incomplete. It's important to grasp the immune reactions occurring during RGC loss as they directly impact cell health.

In this project, researchers will compare immune responses across various mouse models of RGC death and glaucoma. They'll investigate how and where the immune system reacts within the eye during cell death.

This comprehensive investigation aims to provide valuable insights into modulating the immune response, ultimately enhancing RGC survival in glaucoma. If successful, this work could significantly advance understanding of glaucoma in both animal models and human patients.  
**Dr Corey Smith, Dr Balwantray Chauhan,  
Dalhousie University, Halifax NS**

## Evaluating Side Effects of PGAs in Patients with Glaucoma

This research aims to understand the side effects of prostaglandin analogues (PGAs) in patients newly diagnosed with primary open-angle glaucoma (POAG).

The study will establish standard methods for assessing these side effects.

Researchers expect that patients treated with PGAs will show significant, measurable changes in their eyes compared to control groups. Over time, these changes are expected to become more pronounced, providing clear evidence of the impact of PGA therapy on ocular characteristics.

**Dr Michael Balas, Dr David Mathew,  
University of Toronto, Toronto ON**

## Legacy Gifts: Benefits of Including the Glaucoma Research Society of Canada in Your Will

**Making a difference:** Naming the Glaucoma Research Society of Canada (GRSC) as a beneficiary in your will can help pay for research into finding a cure for glaucoma, the leading cause of irreversible blindness.

**Tax benefits:** Leaving a donation of stocks, bonds or cash in your will to the GRSC will bring your estate significant tax savings.

**Simplicity & Flexibility:** Naming the GRSC in your will can be easy with the help of a lawyer and will give you the chance to choose how to make your gift (e.g. whether to donate cash, securities, etc.)

**Honouring a loved one:** Some people name the GRSC in their will as a way to honour a loved one who suffered from glaucoma.

**Encouraging others to do the same:** By naming the GRSC in your will, you can also inspire others to do the same, helping to build a culture of philanthropy and giving.

**Providing for the future:** Making a bequest can help to ensure that the GRSC will continue to be able to fund this vital research.

**Please discuss the best plans with your loved ones.** If you've already left a gift to the GRSC in your will or if you are thinking of doing so, please reach out to let us know or to discuss it further. Our contact information is adjacent, and if you prefer we can put you in touch with our **Legacy Gifts Consultant, Martin Chasson, CA, CPA.**

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