

Let's promote public awareness of glaucoma and encourage early diagnosis.

The Foundation's Mission

The Quebec Glaucoma Foundation was created in the spring of 2007. The Foundation has two major goals. The first is to educate the population about glaucoma: the disease, its prevention and treatment. The second is to promote glaucoma research in Quebec.

By promoting public awareness of this disease, the Foundation will encourage those at risk to seek screening for early diagnosis. To that end, information will be diffused in the media, posted on the web and published in the Glaucoma Foundation newsletter.

We also want to inform glaucoma patients about their treatment options and encourage them to comply with their medical treatment in order to preserve as much of their eyesight as possible. We will host information sessions at the Montreal Glaucoma Institute and at other sites across Quebec. These information sessions will be available to both newly diagnosed patients and those who have already been diagnosed with glaucoma so they can benefit from additional information about this disease and get answers to their questions.

In the area of research, the Foundation plans to invest in genetic and pharmaceutical research. Our research aims to discover which genetic factors are involved in glaucoma and which chromosomal regions contribute to the onset of this disease. Findings of this nature would have a significant impact on glaucoma screening by targeting people at risk more precisely and thus enabling early diagnosis.

The findings of such research could also help eliminate undesirable side effects of existing medications and help develop newer more effective medications.

What is glaucoma?

Glaucoma is one of the leading causes of blindness in North America. Annually, about 12% of newly reported cases of blindness are due to this disease. Glaucoma affects around 1% of the population age forty and over.

Glaucoma is an eye disease that can cause damage to the optic nerve which links the eye to the brain. This nerve transmits visual information from the eye to the

brain, where the information is processed and transformed into images. The exact causes of glaucoma are not yet known, but we do know that a high intraocular pressure is a major risk factor for this disease.

High intraocular pressure can damage the optic nerve, which in turn can cut off the transmission of certain visual signals. This can lead to an incomplete image of what you see by reducing the visual field and

without any treatment this condition could lead to blindness.

What are the risk factors?

Anyone can develop glaucoma, however certain people are at higher risk. The following is a list of risk factors:

- Over 40 years old
- Family history of glaucoma
- Abnormally high intraocular pressure

- Of African, Scandinavian, Celtic or Russian descent
- Diabetic
- Nearsighted
- Retinal detachment
- Previous eye injury
- Narrow angles
- Abnormal visual field exam

If you do have one of these risk factors it is important for you to get your eyes examined regularly. An early diagnosis, followed by immediate treatment can slow down or even stop the progression of this disease.

The symptoms of glaucoma

Glaucoma progresses slowly; in most cases it takes quite a few years before symptoms appear. Unfortunately when symptoms do appear, this usually means that the optic nerve has already experienced irreversible damage. In the majority of cases when the disease is in its advanced stages, the patient will experience a narrowing of their peripheral vision that can lead to a loss in visual acuity.

Because glaucoma progresses slowly, early diagnosis is fundamental in order to slow down or even stop its progression. However, certain patients who present known risk factors seem to be unaware of the dangers of not getting regular screenings because they feel no symptoms. It is essential to remind patients of the importance of regular screenings for the purpose of early diagnosis.

Intraocular Pressure (IOP)

The eyes are filled with fluids that help maintain a certain internal pressure called intraocular pressure. The front of the eye is filled with a fluid called the aqueous humor, which lubricates and nourishes its different parts. This liquid circulates within the chambers of the eye and is drained through certain pathways. If for any reason these pathways are obstructed even partially, the aqueous humor cannot be adequately drained and the IOP increases.

IOP can easily be measured and is considered a major factor when diagnosing and treating glaucoma. A normal IOP is about 12 to 22 mm Hg (millimeters of mercury). An abnormally high IOP is considered to be a major risk factor for glaucoma and getting it within normal limits is one of the main components of treatment. When IOP is controlled there is less risk of the optic nerve being damaged and this ensures the preservation of vision for most patients.

How is glaucoma treated?

Unfortunately, glaucoma cannot be cured, however it can be successfully treated if it is diagnosed early. Presently, there exist three ways to lower intraocular pressure: using medication, laser treatment and surgical intervention.

The medications used for treatment consist of: eye drops that decrease the production of the aqueous humor, drops that increase the outflow of the aqueous humor and

drops that do both. The medical treatment of glaucoma usually begins with a prescription for one medication. The patient's age and the type of glaucoma treated will determine the choice of medication. If one type of medication is not sufficient to lower the IOP, then the use of two or even three different types of drops will be considered.

Without an adequate response to medication, laser treatment or surgical intervention could become the next treatment option. These two treatment options will be covered in the upcoming issues of this newsletter.

The HRT

The HRTIII takes a three dimensional picture of the optical nerve. This device provides software capable of early detection of the presence of glaucoma. Above all, it is able to show the progression of the disease even before any damage has been caused to the visual field.

After the fourth visit, this machine is capable of detecting whether the damage to the optical nerve has progressed. Certain studies have concluded that it can detect damage to the optical nerve even before the doctor can.

The HRT machine costs 52,000\$

Interview

Dr. Paul Harasymowycz is an ophthalmologist who specializes in glaucoma. His training, professional experiences and his devotion to improving glaucoma therapy led him to establish the Montreal Glaucoma Institute and the Quebec Glaucoma Foundation.

What do you foresee as the future technological advances involving the prevention of glaucoma?

The prevention of glaucoma or what we call screening is the main focus of my personal research. I think that with each case that we can detect, we can either slow down or even stop the progression of this disease. So therefore instead of studying effect a versus effect b of a certain drug, the actual screening process is an important factor to study.

Firstly, we need to identify which part of the population is at risk for developing glaucoma, and I believe we are getting to know them better. People of certain ethnic backgrounds are more predisposed to this disease. For example, Afro-Caribbean people mainly develop high pressure glaucoma whereas in Japan we see mostly low pressure glaucoma. Scandinavian and Mediterranean people tend to have exfoliative glaucoma.

Family history also plays a role. If someone in the family develops glaucoma, there is a higher percentage of risk that other members will develop it too (brother, sister, child). However, the most well

known factor is age. With the ageing of the population, for example the "baby boomers" who are becoming older, the incidence and prevalence of glaucoma greatly increase.

We don't know yet the best way to screen for glaucoma and this is another factor that requires research. Ophthalmologists are overbooked and our healthcare system is already too congested to be able to absorb more patients simply for screening. So one aspect of our research is evaluating what equipment would best assist a high volume screening process. The proper equipment can help detect people with elevated risk factors and those who definitely have glaucoma.

I believe a part of our role as healthcare professionals is to promote glaucoma screening within the population, but without any financial assistance (foundations, government, volunteers etc.) this task is impossible. Of course the costs of such an endeavor are significant. Considering our healthcare system rarely funds screening for illnesses and that various organizations need funding for studies on screening illnesses, competition is an ever present reality. Thus, one of our objectives in researching glaucoma screening is to find the most economical, accessible and cost-effective means of screening for this disease. More specifically, that the personal and societal costs of screening a person with risk factors is less than the costs generated

if this person were to lose a functional part of his or her vision.

What were your goals in opening the Montreal Glaucoma Institute?

My ambition was to offer the best that I have observed world wide in glaucoma care right here in Quebec. The goal was to create a world-class facility, bringing together under one roof the best technology and the most competent doctors in order to provide excellent care for patients with glaucoma or those at risk for developing it.

Our doctors

At the moment, we have six glaucoma specialists working at the Institute. They have all completed their fellowships in glaucoma. Under the same roof we have the Bellevue Ophthalmology Clinic that adds fifteen more ophthalmologists to our team, many of whom have specialties in other areas of ophthalmology. Several of our colleagues practice general ophthalmology and their education renders them more than qualified to follow regular glaucoma patients. Most of our doctors divide their practice time between the Institute, the Clinic, a hospital to which they are affiliated and university teaching.

In order to ensure the quality of the services we offer we send our support staff for studies to become certified ophthalmic assistants. Our doctors also train our personnel and give them conferences to teach them how to best explain to patients how to manage their illness.

Technology

Technology plays an important role nowadays in the screening and progression of glaucoma and therefore we have all the instruments necessary for screening and treatment purposes. This enables our doctors to treat glaucoma patients the way they should be treated in the twenty-first century.

Research

When you bring together specialists, ophthalmologists and first rate technological equipment another possibility emerges, the possibility for research. Presently, we have about ten studies on glaucoma underway, two of which are FDA studies. One of our studies involves

the Solx laser. We are one of ten centers worldwide that have access to it and this benefits our patients. So we were able to create one of the best glaucoma clinics in the world, an opinion shared by quite a few foreign colleagues who have visited our facilities. To my knowledge, there is no comparable clinic in Canada.

What are the advantages of the most recent technology?

Traditionally, glaucoma patients were tested by taking visual field exams. It is now accepted that when a loss of peripheral vision is detected through this means, the optic nerve has already been damaged by thirty to forty percent. However, the newer psycho-

physical tests such as the FDT Matrix can detect a twenty percent damage.

With the arrival of even newer medical imaging technology such as the HRT (a 3D photo of the optical nerve), the GDx (a 3D photo of the optic nerve fibers) and the OCT (a 3D photo of the layers of the retina) we can detect damage much earlier on than with a visual field test alone. Unfortunately, with the budget constraints in our public healthcare system, these newer and costlier medical imaging exams are not covered. We find this regrettable, since this new technology can detect as little as three percent nerve damage.

The Quebec Glaucoma Foundation is a non-profit organization that depends on the generosity of its donors. Your contributions and participation will always be welcome and we thank you for your interest in glaucoma. A gift today could one day benefit you or one of your loved ones. We thank you for your generosity.

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