

A Gift to Save Sight

In 1997, Paul Eichler received a devastating call from his daughter, Allyson Buker, who had an acute glaucoma attack at a very young age and was threatened with blindness. Eichler knew he could not sit back and watch this happen; he had to do something to prevent his daughter from going blind. A good friend and clinician from the Rockefeller University School of Medicine immediately referred Buker to the Wilmer Eye Institute to be examined by Harry Quigley, M.D.

After her first appointment, Eichler pressed his daughter for information to learn more about glaucoma and the research that was being done at the Wilmer Eye Institute.

He was inspired and “fascinated by Quigley’s research and the dedication of the Wilmer doctors to provide the best care and treatment for their patients.”

As a co-trustee of the Leonard Wagner Charitable Trust,

Eichler asked how he could help. He was motivated by the idea that Wilmer doctors could “change the world” and restore sight to not only his daughter, but also to the millions of people who have lost their sight from glaucoma. Quigley shared his research funding needs to start a project to study the ganglion cells in the back of the eye and the possibility of regenerating the optic nerve. Due to the novelty stages of the research, it was difficult to find public funding. A \$500,000 pledge by Eichler and Alex Foulger, the co-trustees of Leonard Wagner’s trust, enabled Quigley to hit the ground running.

Since then, Eichler and the Trust have generously contributed \$2.3 million to Quigley’s research and have made it possible for Quigley to attract public funds to further groundbreaking discoveries in glaucoma research at Wilmer. Eichler’s daughter has recently relocated to Florida, but chooses to keep in close contact with Quigley. Eichler notes, “She (Buker) knows that if there are any developments in her condition, Quigley is the guy to turn to. He is quite a guy and we are happy to be a part of his research!” □



Quigley’s column:

“Many esteemed researchers at Hopkins told me it could not be done,” Harry Quigley, M.D. stated referring to a note from a colleague detailing 48

reasons the regeneration of the optic nerve could not occur. This note has served as a road map for Quigley in his pursuits.

Some 1.2 million to 1.5 million retinal ganglion cells exist in the human retina, but these cells die in glaucoma. Quigley and his team are searching for ways to stimulate the regrowth of retinal ganglion cells and restore transmission of visual information to the brain.

At Wilmer, Quigley and his team found that they could grow larger cultures of cells from the eye in the lab using growth factors. When inserted into the affected eyes of mice, the transplanted progenitor cells travel to the areas of the retina damaged by the glaucoma. The next steps will involve turning these cells into the type of nerve cells that are lost in glaucoma and reconnecting them to the remaining cells in the eye and brain.

Looking ahead, Quigley foresees a capsule that could be inserted into the eye. It would contain genetically modified cells from humans that express a growth factor to slow the damage from glaucoma.

“Gifts such as those from the Wagner Trust allow us to explore exciting new ideas and look outside our established ways of thinking,” offers Quigley. In addition, the promise of private funding motivates junior investigators to enter the field and enables researchers to offer job security for key laboratory personnel, particularly between grant funding periods, he adds. “With this economy and the insecurity of public funding, we are especially grateful for gifts of this kind.” □

Living With Glaucoma Balancing Cost with Quality of Life

Reading the paper and driving to work are daily tasks that individuals often take for granted. However, when glaucoma attacks the eye, these everyday activities are no longer so easy. Pradeep Ramulu, M.D., Ph.D. is studying the timeframe when patients with glaucoma are forced to think twice about these “everyday” activities. As patients with glaucoma know, the earliest stages of the disease produce no changes in vision and can only be detected by a complete eye exam and visual field testing. As time goes on, glaucoma can do significant damage to the eye and cause blindness rather rapidly.

While many safe treatments for glaucoma exist, all treatments have a “cost.” In the case of eye drops, this cost may involve the inconvenience of having to take daily drops, the irritation associated with the drops, or the costs of eye drops. With surgical treatments, this cost also includes the risks associated with surgery including permanent loss of vision.

Glaucoma specialists try to balance the costs of treatment with the impact of the disease. This balance could be achieved more effectively if doctors were able to compare the clinical tests that are done on a regular visit (like visual field tests) with the actual challenges patients with glaucoma are faced with in terms of real world activities (like driving and reading). Numerous studies have asked patients about their quality of life and whether they notice their sight affecting their ability to perform daily tasks, but these studies were only in the form of questionnaires.

At Wilmer, the glaucoma division has begun actually testing how much patients are impaired from glaucoma, determining when they read slower, walk less, or decide to stop driving. This information will allow doctors to better balance the costs and risks of treatments with the preservation of enough vision to allow patients a full life. □

At the Forefront of Technology

Electronic health records have become a “hot topic” among healthcare providers as a way to streamline medical care and ensure patient safety. Resistance from doctors unwilling to give up their handwritten notes has been widely reported, but the Wilmer Glaucoma Division recognizes the expectations of its patients to lead the way and adopt the use of information technology in the healthcare industry.

Grateful patients have helped lead this effort by generously contributing funding, with an especially generous gift made in the form of a bequest from a patient.

One area in which patients are pushing the adoption of information technology in medicine is in the area of Personal Health Records (PHRs). Using PHRs, patients are able to collect and organize their medical information electronically. Once the information is in the PHR, patients can then control who has access to that information. If widely deployed and used, PHRs have the potential to overcome the need for each patient to remember and communicate their entire medical history to every physician they come into contact with. Instead, the physician will be able to access the information in the PHR. After each encounter, the physician’s office will update the information in the PHR so it is current for the next visit, whether in the same office or elsewhere.

Furthermore, because PHRs store medical information electronically, they have the potential to facilitate uses of medical information that are impossible in a paper-based world.

Relying on his background in engineering, computer science, medical informatics as well as ophthalmology, Michael Boland, M.D., Ph.D. has recently received funding from Microsoft Corporation to develop and test one such use of PHRs. To facilitate the study, Boland’s team will be building a software interface to Microsoft’s new PHR, dubbed HealthVault (healthvault.com).

Once the connection to HealthVault is in place, Boland will be conducting a study to determine whether adherence to glaucoma drops can be improved using medication information stored in HealthVault coupled with automated reminders to take those medications. These reminders will be in the form of phone calls, text messages, or e-mails.

For example, patients involved in the study might receive a phone call every day at 8pm reminding them to take their eye drops. Based on prior work done at Wilmer, there is a subset of our patients who do not take their drops on a regular basis because they forget. Researchers believe these automated reminders have a good chance of increasing the number of drops taken correctly by the patients, thereby reducing their risk of vision loss. □

Eye Drop Effectiveness

Harry Quigley, M.D. and David Friedman M.D., M.P.H., Ph.D. of the glaucoma division have demonstrated how often patients fail to use their glaucoma drops. However, regular use of eye drops is not the whole story when it comes to getting the most effect from your eye drops.

Henry Jampel, M.D. is initiating a study to determine if eyelid closure and blocked tear ducts actually increase the effectiveness of eye drops in lowering eye pressure. Many patients have probably been instructed to close their eyes or hold their finger between their eye and nose in the hope of decreasing side effects from the eye drops and increasing their success. However, these actions are only weakly supported by science.

The studies to prove this method have only involved pilocarpine and timolol, and have not included the new agents used to lower eye pressure. Furthermore, these studies evaluated 5 full minutes of eyelid closure and blocking of tear ducts, which for patients on three different eye drops would require at least 15 minutes for eye drop application. This time commitment could actually discourage patients from using their glaucoma drops.

Jampel hopes to be able to answer whether eyelid closure and blocking tear ducts make all glaucoma drops more effective, whether both are necessary, and how long these maneuvers need to be performed. If 30 seconds were as effective as 5 minutes, it would be an important improvement in convenience for the patient. □



David Friedman M.D., M.P.H., Ph.D. examines a patient in China as part of his angle closure glaucoma research.

Wilmer Study in China

David Friedman M.D., M.P.H., Ph.D. has started enrolling patients in a study of how to treat people at risk for angle closure glaucoma. This study will be carried out in Guangzhou (Canton), China and will screen over 10,000 people to enroll almost 1,000 in the study. One eye will have a laser iridotomy (which makes a small hole in the iris) and the other will be left untreated. The participants will be followed for five years.

This research will help determine how angle closure glaucoma is managed throughout the world. Millions of people are at risk for angle closure glaucoma, and this study will help doctors decide which ones need laser treatment and which can be observed. This research is an example of the collaborative spirit that is part of the glaucoma division. We are carrying out this research with colleagues from Moorfields Eye Hospital (London) and one of our former trainees who is a Professor in Guangzhou. □

Glaucoma Division Faculty

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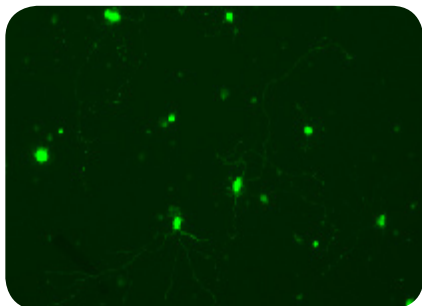
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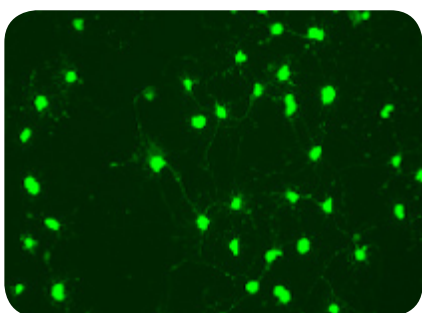
If you are interested in supporting these doctors and the research they are doing at the Wilmer Eye Institute, please contact:
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Identifying New Glaucoma Treatments



Nerve cells from the eye growing under standard conditions (top).

More numerous, larger, and healthier nerve cells treated with a new drug compound (bottom).



A new treatment plan for glaucoma patients could be within reach. Don Zack, M.D., Ph.D. and Harry Quigley, M.D. have partnered to re-search a new drug compound that could further protect the eye from blindness caused by glaucoma.

Vision loss and blindness in glaucoma patients result from death of retinal ganglion cells, the nerve cells that receive light information in the eye and carry it to the brain. The main approach that glaucoma specialists now use to keep the ganglion cells alive is by lowering the eye pressure with eyedrops, laser treatment, or surgery. Although these treatments often work, a more consistent and effective protection from glaucoma blindness would be welcomed by those faced with the disease. Researchers at Wilmer are working hard to find additional treatment strategies to enhance the results of the traditional approaches to lowering eye pressure. One strategy is called “neuroprotection,” which involves the discovery of drugs to preserve the health of the ganglion cells.

Zack has developed a rapid way to identify possible drugs that keep these cells alive and healthy. Zack purifies ganglion cells in lab dishes and adds hundreds of possible test chemicals. An automated microscope system, donated by a generous patient, measures the health of the cells in the lab dish. The results help identify which test chemicals should be used to create the new drug. Using this approach, Zack and his team have identified several promising compounds. In collaboration with Quigley, Zack’s team will soon study the effectiveness of these recently discovered compounds by using animal models of glaucoma. □

Batting Average In order to provide the best care, the Glaucoma doctors at Wilmer are conducting a study to evaluate the successes and limitations of the surgeries they perform. The results of the first major glaucoma procedure they reviewed showed **95%** of these operations conducted by the glaucoma division at Wilmer achieved their primary goal with no further surgery needed. The results of this study revealed a number of suggestions by patients on how surgeons can perform this type of procedure more effectively. The results will soon be published in a medical journal to improve the effectiveness of this surgery performed by surgeons around the world.

Save the Date:
Robert H. and Clarice Smith
Building Dedication

October 16, 2009

Celebrate this new beginning on the 80th
Anniversary of the original Wilmer Dedication!

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