

# Gleams

Glaucoma  
Research Foundation

May 2007 vol 24 no 3

## Glaucoma Can Strike At All Ages — Even Newborn Babies

By David S. Walton, MD, Guest Medical Editor

Over 3 million Americans have glaucoma. And this is a cause of blindness that does not just affect older age groups. Glaucoma can strike even newborn infants. Childhood glaucoma occurs in 1 out of every 8,000 children in the United States. Primary congenital glaucoma (PCG) accounts for approximately 50% to 70% of all cases of childhood glaucoma.

In most cases, primary congenital glaucoma is diagnosed within the child's first year. Although uncommon, *newborn* primary congenital glaucoma is an important subtype of primary congenital glaucoma, notable because it is often the most severe and clinically challenging expression of this disease. Babies born with newborn glaucoma typically manifest specific signs that help doctors to diagnose it at birth — signs which also become



important in the assessment and determination of appropriate treatment.

Primary congenital glaucoma is the most common hereditary childhood glaucoma and an important cause of childhood blindness. For babies born with glaucoma, as well as infants who develop glaucoma, there are many significant challenges facing the child, the parents, the siblings, and health professionals caring for the child.

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And Their Families



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*Glams* is published  
three times a year by the  
Glaucoma Research Foundation.

251 Post Street, Suite 600

San Francisco, CA 94108

Web: [www.glaucoma.org](http://www.glaucoma.org)

Telephone: 415-986-3162

Toll Free: 800-826-6693

Email: [gleams@glaucoma.org](mailto:gleams@glaucoma.org)

Editor: Andrew Jackson

To unsubscribe, call 1-800-826-6693 or  
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ISSN #1072-7906

## Glaucoma Can Strike At All Ages – Even Newborn Babies

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Both medical and surgical methods are used in treating childhood glaucoma. Medical treatments can come in the form of eye drops, pills, or suspension of medication for administration by mouth. These treatments help to either increase the exit of fluid from the eye or decrease the internal ocular production of fluid. Both approaches result in a lowering of the eye pressure. Surgical procedures that are used to help control eye pressure include goniosurgery, filtration surgery, glaucoma implant surgery, and laser surgery. It is sometimes necessary to repeat glaucoma surgery in order to successfully control eye pressure. This can be difficult for the child and discouraging for parents. It is important that the child's physical and emotional needs are considered by both the parents and the health care team.

Glaucoma refers to a group of eye diseases with common features that may include elevated eye pressure, damage to the optic nerve, and potential vision loss. There are many causes of adult and childhood glaucoma. Quite simply, childhood glaucoma refers to the presence of glaucoma in a child. Congenital glaucoma is the common term used for glaucoma

when diagnosed in infancy or early childhood.

Childhood glaucoma is associated with physical changes in the eye that are caused by the high pressure. Enlargement of the eye, cloudiness of the cornea, and injury to the optic nerve are examples of changes that can occur as a result of glaucoma. There are many possible mechanisms for the drainage problem that results in childhood glaucoma. In each case, abnormal fluid drainage from the eye is the result of a blocked or defective trabecular meshwork drainage system. The increased fluid pressure can push on the optic nerve and cause cupping (an abnormal enlargement in the optic disc area, which is the junction between the eye and the optic nerve). If the pressure remains too high for too long, the optic nerve fibers are permanently damaged.



Dr. Walton  
is Clinical  
Professor of  
Ophthalmology  
at Harvard  
Medical School,

and is in private practice specializing in pediatric ophthalmology in Massachusetts. He is internationally recognized for his expertise in treating childhood glaucoma, and is co-author of GRF's *Childhood Glaucoma* booklet. Dr. Walton is pictured with his patient, Andrea Williams, age 5.

## Spotlight On Research:

# CFC Research Results in Greater Understanding of Glaucoma

Annual Report from the Catalyst For a Cure (CFC) Research Scientists

The year 2006 was filled with significant advances both in terms of tangible results and in our understanding of how glaucoma progresses. During the past year, we have expanded our studies to determine how and why retinal ganglion cells lose function in eyes with glaucoma.

## Understanding Early Changes

We have discovered that the retinal ganglion cells change early and slowly in a process that makes the cells atrophy, both in size and in the expression of key functional genes required to maintain connection to the brain. Even though the nerves look intact early in the disease, we now know they already show reduced function. To make the situation worse, once large groups of these cells have lost their connection to the brain, this appears to be an additional stress that promotes the rapid spread of the disease within the eye. The good news is that we now know a great deal about the cells and molecules underlying these insidious changes and are developing strategies to prevent them.

## Microglia Important

The CFC also obtained strong evidence that cells called microglia are involved both early and late in



The CFC scientists are, from left to right, Dr. Nicholas Marsh-Armstrong (Johns Hopkins University), Dr. Monica Vetter (University of Utah), Dr. Philip Horner (University of Washington), and Dr. David Calkins (Vanderbilt University).

the disease. Early in the disease progression, microglia may contribute to the slow progressive atrophy of retinal ganglion cells, and late in the disease, microglia may mediate the spread of the disease from focal to widespread. However, the group also demonstrated that some signals from microglia are helpful, so it will be

important to understand when different signals are used in the disease.

## A Working Model of Glaucoma

During 2006 the CFC research team published several important studies in scientific journals and performed our first interventional trials, which brought initial validation of several of the hypotheses that we proposed a year earlier. In addition, we have generated new findings, many of which offer promise for therapeutic interventions.

However, perhaps the most important thing that occurred to the CFC team in 2006 was getting to a point where we have a clear working model for what goes wrong in glaucoma and why. The challenge now is to test these ideas and initiate interventions that will bring us closer to success in our fight against this devastating disease.

# People Making A Difference

## Allergan Funds New Spanish-Language Brochure Union Bank Grant Supports Web Accessibility

A gift of \$125,000 from **Allergan** will not only continue to make available GRF's definitive reference for the newly diagnosed, *Understanding and Living with Glaucoma (UG)*, but, for the first time, also make it available in a new Spanish-language translation. "Hispanic/Latinos are at the highest risk for glaucoma," notes GRF President and CEO **Thomas M. Brunner**. "There is an urgent need for the proven resource our

*UG* has become, and we are most grateful to Allergan for renewing one of our most enduring partnerships to make these essential publications available."

**Union Bank of California Foundation's** increased gift of \$7,500 in support of GRF web accessibility for the vision impaired was presented in person at the recent Annual Meeting dinner by Branch Manager **Nicholas Zukowski**.

A comprehensive mailing of GRF's new glaucoma awareness materials to all 100+ campuses of the Historically Black College and Universities was partially underwritten by **Guide Dogs for the Blind**.



Guide Dogs board member Clayton Earle serves on GRF's HBCU Leadership Committee.

An overwhelming response to GRF's first-ever benefit, *Speeding the Cure. Spreading the Word*, produced a net contribution to GRF research and education of \$150,000 on gross proceeds of \$200,000. "We were so gratified



A highlight of the January benefit was the presentation of the 2007 Catalyst Award to Ted Barr, left, by Silicon Valley entrepreneur Steve Kirsch.

to see such a broad cross section of people concerned with glaucoma participating in our benefit," said Brunner. In addition to lead funding from **Citigroup**, and **Deirdre Porter and Bradford Hall**, corporate underwriting included **Alcon** (with a table led by Alcon Foundation President **Winona Edwards**), **Allergan**, **Blum Capital Partners/Blum Family Foundation**, and **Pfizer**. **Santen's** table was led by President and CEO **Adrienne Graves PhD**; **Ellex** was led by President and CEO **Peter Falzon**; with other corporate sponsors including **Lumenis**, **CB**

### SAVE THE DATE

*The 30th Anniversary Celebration*

**Speeding the Cure.  
Spreading the Word.**

Wednesday, January 23, 2008  
Westin St. Francis Hotel,  
San Francisco



2008 Catalyst Award Honoree  
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## Allergan and Union Bank Funding

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**Richard Ellis, and Burr, Pilger & Mayer.** A large contingent of physicians included **Shiu Kwok MD**, President of Prevent Blindness of Northern California (attending with Executive Director **Lynda Gayden**), **Mark Mannis MD** (Chair, UC Davis Ophthalmology), and **Kuldev Singh MD** (Glaucoma Director, Stanford), along with GRF board members **J. Bronwyn Bateman MD**, **Andrew Iwach MD**, and **Robert Stamper MD** (Director Glaucoma, UCSF, attending with That Man May See President **Kathleen L. Rydar**). Major

gifts inspired by the event came from **Warren and Alyce Williamson** (Pasadena, CA), **Richard Hirayama, Charles Bobrinskoy** (Glenview, IL), **Irene Harris, Shirlee and Gene Ray Bouch MD** (Long Beach, CA), **Virgene and James Beam** (Bel Air, CA), and literally every GRF board member, including 2007 Catalyst Awardee **Ted Barr** and wife **Melza**, **Fred and Cynthia Brinkmann**, and **June Behrendt-Otto and Sean Otto**. GRF volunteer **Art Takahara** was singing in cameo appearance by **Valley Chorale** during the reception and stepped out to announce that a Silicon

Valley chapter of GRF is being formed, with an inaugural event for the fall. Event co-chairs were **H. Allen Bouch** and **Gena Harper**. Volunteers were members of the Diablo Valley chapter of **Delta Gamma**.



The benefit dinner was kicked off with proclamations from California State Senator **Leland Yee PhD** (right), and Santa Clara county supervisor **Liz Kniss** (left).

## In Appreciation

Our deepest appreciation for the generosity of our donors at the \$1,000 level and above, including members of **The Catalyst Circle, The Blanche Matthias Society**, and institutional donors.

(Contributions of record November 28, 2006 to March 26, 2007)

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Skirball Institute, New York University, NY

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## Low Vision Tips

If you or someone close to you has low vision due to glaucoma or another eye disease, here are some simple tips to help continue living an active daily life.



**Improve Lighting** — Add additional light for specific tasks. Use directed lighting from behind the shoulder to reduce glare. Be sure that bathrooms, kitchens, hallways, closets, and stairways are well lit.

**Increase Contrast** — Pour your coffee into a white cup, and your cereal into a dark bowl. Set white plates on dark place mats. Use a black cutting board for white onions and a white cutting board for dark-colored foods. Use felt tip pens instead of ball point pens.

**Control Glare** — Wear amber or dark yellow glasses or clip-ons to reduce glare, and wear a cap with a brim or a visor outside. Cover shiny surfaces with a cloth.

**Get Organized** — Always keep your money, keys, and medications in the same place to make them easier to find. Have a designated place for everything in your home, and request that others in the household respect and maintain the organizational system.

**Enlarge Text** — Request large-size checks from your bank. Use large print crossword puzzles and playing cards. Photocopy and enlarge favorite recipes, addresses, and take-out menus. Use the accessibility features on Macintosh and Windows computers.

**Mark and Label** — Mark key positions on your stove, microwave oven, washing machine, and thermostat with dimensional fabric paint or nail polish so you can feel the correct positions. Label spices and medications with a dark marking pen. Carry your address labels with you to use when filling out forms.

**Listen to Books** — Listen to audio tapes and books on CD borrowed from your local library, or from the free Talking Books program sponsored by the National Library Service.

You may also consider visiting a low vision specialist who can help you to get organized and assist you in maintaining your independence.

For more information, visit our website at [www.glaucoma.org/living/](http://www.glaucoma.org/living/) and click on "Low Vision Resources."

# Q&A

Moses V. Chao, PhD.

## Neuroprotection and Glaucoma

**Q:** What is neuroprotection and how does it apply to glaucoma treatment?

**A:** Neuroprotection is a broad term to cover any therapeutic strategy to prevent nerve cells called neurons from dying, and it usually involves an intervention, either a drug or treatment. There is significant amount of scientific work that is currently going on in this area, but much more research is needed to identify the best pathways to target for neuroprotection.

The eye is the most accessible part of the central nervous system. The eye and the nerves that are in the retina represent an integral part of the brain. If you have problems in most regions of the spinal cord and brain, they are mostly inaccessible. But in diseases of the eye, we have much more opportunity for direct intervention, which makes it ideal for studying neuroprotection. However, until recently, not much thought and effort has

been directed to promoting neuroprotection for glaucoma.

**Q:** What is the goal of neuroprotection?

**A:** For glaucoma, as well as for other neurodegenerative diseases, the goal is to keep the neurons alive and to prevent cell death. A significant finding of the Catalyst For a Cure research team is the finding that there are several prominent changes in the axons, or processes of nerve cells in the eye, that occur well before there is damage and cell death due to glaucoma. This suggests that we may be able to detect the progression of glaucoma well before those cells are lost and before the disease has advanced.

The CFC scientists are studying genetic changes in glaucoma to help determine which molecules and events are directly responsible for neuronal damage. The more we understand about these processes, the more we can focus on identifying which genes

may be regulated to slow the progression of glaucoma.

**Q:** How soon might new treatments be available?

**A:** Thanks to recent progress in scientific research, particularly in the area of genetic studies and neuroprotection strategies, it is very likely that in the next few years we will produce new neuroprotective therapies for treating glaucoma that will slow progression of the disease. However, because new drugs require many confirmatory tests and approval from the FDA, it could take up to 10 years before a drug can be used by patients.



Moses V. Chao, PhD is Professor of Cell Biology, Physiology, and Neuroscience at New York University

Medical Center and Chairman of GRF's Catalyst For a Cure Scientific Advisory Board.

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**GRF Mission:**

To prevent vision loss from glaucoma by investing in innovative research, education, and support with the ultimate goal of finding a cure.

# The President's Message



Dear Friends,

In January, the Board of Directors approved a Strategic Plan setting priorities for the Glaucoma Research Foundation through 2010.

The planning process began last March with an assessment of the need of those we serve. We surveyed and talked with glaucoma patients and their families and friends, including those at highest risk for glaucoma. We convened physicians and scientists on the front lines of the disease and donors eager to make a difference. The Board also reviewed GRF's strengths and achievements, including results from the first five years of the Catalyst For a Cure research consortium. The CFC has not only opened new insights into causes of the disease, but also shown that collaboration in science can speed the pace of discovery.

To complement the Strategic Plan, the Board crafted a new mission statement: "To prevent vision loss from glaucoma by investing in innovative research, education, and support with the ultimate goal of finding a cure."

Our first-ever benefit, held in January, exceeded expectations as a fundraiser for glaucoma education and research, and guests enjoyed a stimulating presentation from the CFC research scientists. This success, along with our Strategic Plan for the next four years, has further inspired our ongoing commitment to speeding the cure. Thank you for your support, your ideas, and your participation.

Thomas M. Brunner, President and CEO

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