

GLEAMS

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NORMAL-TENSION GLAUCOMA: WHAT YOU NEED TO KNOW

Glaucoma is a group of diseases that have different causes but have some things in common. These include damage to the optic nerve, abnormalities in the visual field, and elevated intraocular pressure. But there is a subset of patients who have the typical findings seen in glaucoma, yet the intraocular pressure is not high. Eye doctors call this normal tension glaucoma (NTG).

It is also sometimes called low pressure or low-tension glaucoma, but the eye pressures aren't low, they're just in the average range. Some patients may have normal tension glaucoma for many years and then develop high eye pressure. So, patients with NTG will need to see their eye doctor frequently for regular, careful testing. The good news is that doctors are very good at measuring the progression of glaucoma, and treating it to slow or halt the progression, so that most patients can enjoy a normal quality of life.

NTG FEATURES AND RISK FACTORS

In normal tension glaucoma, the optic nerve is damaged without eye pressure exceeding the average range (between 10-21mm Hg). Some NTG patients have higher pressures during the early morning hours between 2:00 AM and 6:00 AM when the blood pressure is lowest. This can contribute to the glaucoma progressing. Low diastolic blood pressure is a common association with normal tension glaucoma. Diastolic pressure is the bottom number in a blood pressure reading. And when the bottom number is too low, that is a risk factor for glaucoma progression.

Patients with normal tension glaucoma tend to be older than those with primary open-angle glaucoma

(POAG), but there's a subset that is younger and tend to be women. Japanese ancestry is also a risk factor. In one large study of glaucoma patients of Japanese ancestry, 92% had NTG. Sleep apnea can be associated with either NTG or POAG. It's also common for a patient with normal tension glaucoma to have vascular dysregulation such as migraine headache, Raynaud Syndrome (when fingers and toes turn white when exposed to cold), temperature sensitivity, and light-headedness.

Another risk factor for normal tension glaucoma, just as for high pressure glaucoma, is a thin cornea. Some patients with NTG develop transient hemorrhages of the optic nerve, which can also occur in patients with POAG, but they are more common in NTG.

TREATING NORMAL TENSION GLAUCOMA

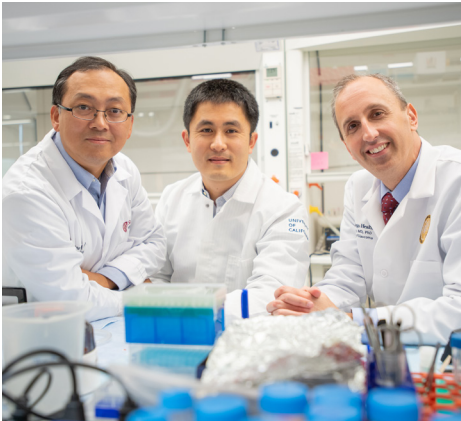
The mainstay of treatment is to lower intraocular pressure, using all the same treatment methods that are used to treat POAG. These include medication eye drops, SLT laser treatment, sustained-release medication implants, cataract surgery combined with MIGS (minimally invasive glaucoma surgery), or traditional surgery such as trabeculectomy. One of the treatment goals is to maintain a steady eye pressure. Patients with NTG need frequent eye examinations and testing to ensure that the treatment is effective and the condition isn't worsening.

Ruth D. Williams, MD is a glaucoma specialist at the Wheaton Eye Clinic in Wheaton, Illinois. She is a past president of the American Academy of Ophthalmology and a national spokesperson on ophthalmic issues.



Catalyst for a Cure: 2024 Research Update

Glaucoma Research Foundation currently has two groundbreaking Catalyst for a Cure initiatives underway. The two teams are innovating, sharing discoveries, and inspiring each other as they work toward finding new treatments and cures.



CFC3: *The Catalyst for a Cure **Vision Restoration Initiative*** principal investigators are Xin Duan, PhD (UC San Francisco), Yang Hu, MD, PhD (Stanford University), Anna La Torre, PhD (UC Davis), and Derek Welsbie, MD, PhD (UC San Diego).

The CFC3 Vision Restoration researchers have made excellent progress to date and have published their discoveries in peer-reviewed scientific journals. Based on their recent findings the scientists believe they have identified ways to accomplish all three of their goals: 1) preventing damage to the retinal nerve cells (retinal ganglion cells) that connect the eye to the brain, 2) restoring health to those retinal nerve cells that were damaged, and 3) replacing lost retinal nerve cells. Their next steps will be identifying the best combination of genes to achieve the maximum preservation of vision in human-relevant models of glaucoma. They believe that clinical trials of nerve cell protection and enhancement may be possible in the next few years and see opportunities for stem cell replacement to move forward in models of glaucoma in the coming years as well.

Learn more about the CFC researchers and their work at www.glaucoma.org/research/catalyst-for-a-cure/

CFC4: *The Melza M. and Frank Theodore Barr Foundation Catalyst for a Cure **Initiative to Prevent and Cure Neurodegeneration*** principal investigators are Sandro Da Mesquita, PhD (Mayo Clinic), Milica Margeta, MD, PhD (Mass Eye and Ear), Karthik Shekhar, PhD (UC Berkeley), and Humsa Venkatesh, PhD (Brigham and Women's Hospital).

The CFC4 investigators in the Neurodegeneration Initiative have been testing specific tissues to compare between Alzheimer's disease, glaucoma, and gliomas. Using bioinformatics techniques, they analyzed existing genetic data and their initial experimental data. Their results suggest several potential common targets for new treatments. The team plans to continue their analysis of tissue from normal and disease models and from patients with these diseases. Their plan is to discover common molecular and cellular pathways across the three diseases of the central nervous system that could be used to advance diagnosis and treatment of these blinding and fatal diseases.

Q&A

Understanding Uveitic Glaucoma

Uveitic glaucoma is a type of secondary glaucoma, which means it's caused by another condition, in this case uveitis, or inflammation of the eye.



Sarah R. Wellik, MD
obtained her undergraduate and medical degrees at the University of California, Irvine. She completed her internship at Yale University followed by ophthalmology residency at Boston University, and a glaucoma fellowship at Bascom Palmer Eye Institute. She is currently a Professor of Ophthalmology and Medical Director of the Glaucoma Service at Bascom Palmer Eye Institute at the University of Miami Miller School of Medicine in Miami, Florida.

Q What is Uveitic Glaucoma?

A Uveitic glaucoma is a type of secondary glaucoma caused by uveitis or ocular inflammation. Uveitis can occur for a variety of reasons, such as certain autoimmune conditions and infections. Some of these disorders tend to affect only one eye and other forms can affect both eyes. Estimates are that up to 20% of patients with uveitis may develop glaucoma.

Q How does uveitis cause glaucoma?

A The relationship between uveitis and glaucoma is a complex one. Glaucoma is an optic neuropathy with elevated intraocular pressure (IOP) as one of its primary risk factors. Uveitis can cause increased IOP when inflammatory debris obstructs the trabecular meshwork resulting in decreased fluid outflow from the eye. In the long-term, inflammation can also cause scar tissue that further obstructs fluid outflow.

Q How can we treat uveitic glaucoma?

A Treatment focuses on controlling both the uveitis and the elevated IOP. Uveitis is commonly treated with corticosteroids, a class of drugs with anti-inflammatory action. Steroid medications for uveitis are usually administered as eyedrops but may also be injected or implanted into

or around the eye or given as pills. Uveitis may also be treated with non-steroid medications that modulate the immune system. Some cases of uveitis caused by infections can be treated with antibiotics or anti-viral drugs.

For elevated IOP, the ophthalmologist may use many of the same IOP lowering drugs as for the other types of glaucoma. In some cases, surgical intervention may be necessary which is most often insertion of a small tube called a glaucoma drainage device. Laser treatment for this type of glaucoma is usually avoided because it can cause more inflammation.

On the Horizon

Through research, doctors are gaining a better understanding of how to best treat uveitic glaucoma. The medical community now has more effective treatments for inflammatory diseases and a better understanding of which types of glaucoma medications and procedures have the best outcomes.

The Takeaway

Patients may find their condition difficult to cope with. A collaborative relationship with the medical team and connecting with support groups and resources can provide additional help and encouragement.

IN APPRECIATION

We are incredibly grateful for the generous and loyal support from all of our donors. Following is a listing of recent contributions and pledges at the \$1,000 level and above. Please note these are new contributions and pledge payments between **March 1, 2024** and **June 30, 2024** and will not reflect a donor's cumulative giving for the year.

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Linda Linck — A History of Leadership

Linda Linck is a leader in the Delta Gamma women's fraternity and a dedicated board member for Glaucoma Research Foundation, and has been instrumental in forging strong ties between the two organizations.



Linda hasn't always seen herself as a leader. But looking back, it's clear that the seeds were there. And by saying "yes" to the right opportunities, Linda has cultivated them.

In the late 1960s, when paths in science for women were limited, Linda was one of just two female biology majors in her class at UC Santa Barbara. Following advice from her parents, whose fraternal connections provided instant support whenever the family relocated, Linda joined Delta Gamma, a women's fraternity with a deep commitment to leadership and service.

"Saying 'yes' to Delta Gamma has turned out to be one of the best decisions I've ever made," Linda says. "It took me from being a quiet, introverted girl into someone who had the confidence to be herself."

That confidence led Linda to earn a degree in physical therapy and, filling a practitioner shortage with the U.S. Navy, treat young men coming back from the Vietnam War with serious injuries. "The need was tremendous, and the experience was life-changing," Linda says.

Delta Gamma's singular mission is service for sight and aid to the blind, carried out through schools for visually impaired children, hands-on service, and grants to organizations engaged in vision science and care. Since joining the fraternity, Linda has said "yes" to many leadership opportunities, including Vice President/Collegians, National Director of Finance, and Chair of the Delta Gamma Foundation.

Linda has been instrumental in forging strong ties between Glaucoma Research Foundation and the Delta Gamma Foundation — encouraging local alumni chapters to contribute volunteer time and funds, engaging collegians in GRF events, sharing her fundraising insights. "My mother-in-law went blind from glaucoma," says Linda. "That's one of the reasons I wanted to give my time to GRF."

In 2008, Linda accepted Glaucoma Research Foundation's President's Award in recognition of her leadership and service, and in 2009 she said "yes" when invited to join the GRF Board of Directors. Linda continues to give generously toward a cure for glaucoma as a member of the board, as chair of the development committee, as a liaison to Delta Gamma, and as a generous donor.

Sixth Annual Glaucoma Patient Summit

“TRULY AMAZING”



More than 180 attendees, 21 exhibitors, and 21 speakers, presenters, and panelists participated in the 2-day event. Quite a few had attended previous GRF patient summits, but many were attending for the first time. Attendees came from all over the country as well as Canada, Switzerland, and Jamaica.

In the post-event survey, 95% of attendees said the Patient Summit was informative and helpful. Some comments from attendees: “It was one of the best conferences I have attended; there was so much great information, and I met so many wonderful people.” “The Glaucoma Patient Summit is truly amazing. We learned about new diagnostic and treatment techniques, treatment options in the pipeline, and how to best navigate and advocate in our glaucoma care.”

The Seminars on Friday were 90-minute, interactive small-group sessions offering a deep dive into specific topics including “Understanding Normal Tension Glaucoma,” “Supporting Independence with Glaucoma and Low Vision,” and “I’ve Just Been Diagnosed with Glaucoma, Now What?” They were followed by an opening reception where attendees enjoyed networking with other patients, summit speakers, and exhibitors.

The Saturday sessions, hosted by L. Jay Katz, MD, included an inspiring keynote talk by “Vision EYEcon” and best-selling author Kristin Smedley, and discussions of glaucoma medication, laser, and surgical treatment options presented by Monisha Vora, MD and Brian Shafer, MD. A glaucoma research update “Eyes on the Future” by Thomas V. Johnson, II, MD, PhD, was the top-rated session in our survey. A treatment roundtable discussion and sessions on how to be your own advocate and nurture wellness while living with glaucoma rounded out the afternoon. Panelists included glaucoma patients and caregivers, glaucoma specialists, low vision specialists, and other healthcare professionals. An informative summation by Joel S. Schuman, MD, FACS wrapped up the summit, followed by a closing reception with time for networking and browsing the exhibit hall.

View videos from the summit at www.glaucoma.org/summit.

Save the date for next year’s Patient Summit at the Marriott Dallas Las Colinas in Dallas, Texas: June 20 – 21, 2025.

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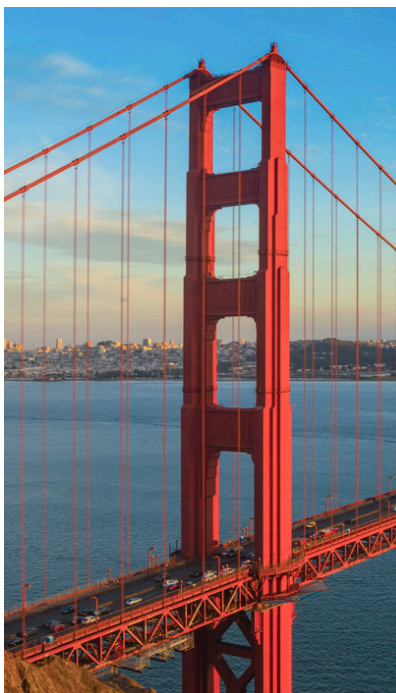
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