

GLAUCOMA
RESEARCH FOUNDATION

GLEAMS

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A DROPLESS FUTURE?

ALTERNATIVE DRUG DELIVERY SYSTEMS FOR GLAUCOMA

When you were last at the eye doctor, were you asked: “When did you put your eyedrops in? This morning? What about last night?” You may have realized that you missed a dose. You are not alone! This happens to many glaucoma patients because it’s hard to get in every dose all the time. In some patients, it is not even a matter of forgetfulness. Mobility problems with the neck, or arthritis in the hands, can make putting in drops physically difficult or even impossible. Unfortunately, no matter the reason, gaps in timing and dosage of eyedrops can cause your glaucoma to worsen. Medications work only when they are used correctly.

For most people, glaucoma is a chronic and slowly progressive disease and eyedrop medications are used for the long term. Over the years, even small pressure spikes caused by missing drops may eventually cause further damage to your optic nerve.

The good news is that there is extensive research and development on “drop-free” or “drop-less” technologies. These devices would deliver the same medications to your eyes to lower eye pressure and treat glaucoma without having to use drops, or with fewer drops. Reducing glaucoma drops on the eye surface may have the added benefit of reducing symptoms of eye irritation and dryness.

NEW DROPLESS TECHNOLOGIES

Various glaucoma drug delivery systems were the topic of a session at the Glaucoma 360 New Horizons Forum in San Francisco (presented by Glaucoma Research Foundation). The medicines in these dropleless systems can be delivered to your eye in a variety of ways:

- A dissolvable implant into the front of your eye that contains the medicine bimatoprost (Durysta, Allergan – this implant is being used in clinics today and is FDA-approved for one-time use)
- A microscopic device placed in the natural drain of the eye that releases medicine (iDose, Glaukos)
- An injectable implant placed in the back of the eye, in the vitreous (GB-401, Graybug vision)
- A dissolvable implant made of gel (OTX-ITC, Ocular Therapeutix) or polymer (ENV515, Envisia Therapeutics) that sits in the front of the eye and dispenses the medicine Travoprost.
- A tiny plug that sits in your tear duct that continually releases medicine into the tear film where it can be absorbed into the eye (Evolute, Mati Therapeutics).

These new devices and technologies are still being researched and developed. Much work needs to be done before we know exactly how well these new drug delivery options will perform in the long term. But it is gratifying to know that new and better ways to treat glaucoma are on the way. Hopefully, this kind of alternative drug delivery technology will result in better preservation of vision for many people with glaucoma.

Ronald L. Gross, MD and Lily Kim, MD

*Dr. Gross is the Eye Care Line Executive at the Michael E. DeBakey Veterans Affairs Medical Center and Professor of Ophthalmology at the Cullen Eye Institute, Baylor College of Medicine in Houston, Texas.
Dr. Lily Kim is a current glaucoma fellow at Baylor College of Medicine.*



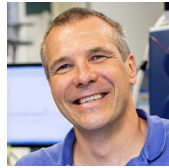
The 2023 Shaffer Grants for Innovative Glaucoma Research

Glaucoma Research Foundation has awarded eight researchers with 2023 Shaffer Research Grants. These one-year grants help to initiate creative research ideas and the scientific results often lead to additional funding. Each Shaffer Grant awards \$50,000 to enable a promising scientist to advance their career in glaucoma research and do the experiments to support their hypotheses. To date, close to 300 grants have been awarded thanks to generous philanthropic support.

The 2023 Shaffer Grants for Innovative Glaucoma Research were awarded to:



Benjamin J. Frankfort, MD, PhD, at Baylor College of Medicine, for his project: "Adrenergic Receptor Function and Role in Neuroprotection"



Karsten Gronert, PhD, at the University of California, Berkeley, for his project: "LXB4 Regulation of Microglia Homeostatic Function a Neuroprotective Target"



Wendy Liu, MD, PhD, at Stanford University, for her project: "Investigating Mechanosensitive Ion Channel Variants and their Role in Glaucoma"



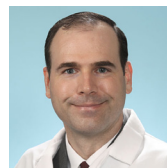
Xiaorong Liu, PhD, at University of Virginia, for her project: "An In Vivo Biomarker to Monitor Glaucoma Progression"



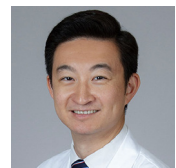
Cezary Rydz, MD, at University of California, Irvine, for his project: "Modulating Ocular Hypertension Induced Accelerated Aging in Rodent Retina"



James Tribble, PhD, at the Karolinska Institutet in Stockholm, Sweden, for his project: "Drug-driven Identification of Inflammatory Pathways in Retinal Microglia"



James Walsh, MD, PhD, at Washington University in St. Louis, for his project: "Choroid Resident T cells are Vital for Retinal Ganglion Cell Neuroprotection in Ocular Hypertensive Injury"



Benjamin Xu, MD, PhD, at the University of Southern California, for his project: "In Vivo Ultrasound Elastography of Iris Stiffness in Angle Closure Glaucoma"

Research outcomes from previous Shaffer Grant recipients demonstrate the impact of this funding in catalyzing the growth and productivity of glaucoma research laboratories across the United States. 93% of surveyed Shaffer Grant recipients said that the Shaffer Grant helped them pursue an innovative idea that would otherwise not have been pursued. Learn more on our website: glaucoma.org/research

Q&A

What Eye Pressure is Safe for Me?

The short answer is that “it’s complicated!” This Q&A addresses some common questions.

Q What is “normal” eye pressure?

A The term “average” eye pressure is preferred over “normal” eye pressure. Most people have eye pressure between 10 and 21 mmHg. However, many people with glaucoma have eye pressure within this range and many people with higher than average eye pressures do not have glaucoma. On the other hand, the risk of glaucoma increases with higher eye pressures, and lowering eye pressure reduces the risk for developing glaucoma and worsening glaucoma.

Q What is my “real” eye pressure?

A Eye pressure is only estimated by our instruments. The thickness and stiffness of the cornea affect pressure measurement. However, research on the impact of eye pressure on glaucoma is based on standard eye pressure readings, and it’s most important to compare eye pressure readings over time.

Q Can I feel high eye pressure?

A Only rarely, if the eye pressure gets extremely high and does so quickly. Usually, glaucoma is a slow process with little to no symptoms.

Q What is acceptable eye pressure?

A An acceptable eye pressure is that which prevents vision loss. This pressure level depends on how severe and how stable the glaucoma damage is, at what pressure level glaucoma damage developed or worsened, and life expectancy. Some doctors set a “target pressure” for each patient. A target pressure may be more of a guideline and not a line in the sand. Risks of lowering eye pressure must be considered.

Q If my eye pressure is better now, does that mean I’m okay?

A Eye pressure goes up and down all the time, more so in people with glaucoma. One lower reading could mean real improvement or just fluctuation. Consistently good pressures and stable glaucoma tests, including visual fields and optic nerve scans, demonstrate that glaucoma is under control.



Mark Werner, MD is an ophthalmologist and glaucoma specialist caring for patients at Delray Eye Associates in Delray Beach, Florida.

IN APPRECIATION

We are incredibly grateful to 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 November 1, 2022 and February 28, 2023 and will not reflect a donor's cumulative giving for the year.

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Million Dollar Eyes: Bianca Beach's Glaucoma Story

*"I've shifted perspective on my eye health.
I took something that used to be a negative and turned it into a positive."*

Nicknamed "million-dollar eyes," Bianca Beach is partially blind and fighting against time, creating art to increase glaucoma awareness. Determined to shed light on the disease, Bianca was awarded a grant from her alma mater, Chapman University, to produce and star in a one-woman stage show titled "Tunnel Vision," which chronicles Bianca's story as she navigates themes of medical trauma, coming of age, perseverance, and advocating for a cure.

By the age of 11, Bianca had been through six surgeries, was on over 28 eye drops per day, and had suffered a retinal detachment in both eyes. Bianca and her family spent one summer with shades drawn

in their home to avoid the pain of the sunlight shining through while on daily drops to dilate her eyes.

Throughout the difficult moments growing up, Bianca insisted on not letting her health issues define her. She was in her final year at Chapman University studying theater when she decided to use her struggle with glaucoma as a form of expression. "Theater is about human connection and creating something people can relate to. I feel empowered being able to take my medical trauma and have it all culminate in using it as a positive narrative. My hope is for young girls to see me owning who I am and feel inspired by that."

Today, Bianca is also pushing boundaries by becoming a Pilates instructor. Due to her many procedures as a child, she was forced to be immobile much of the time to avoid further trauma to her eyes. Her physical therapist recommended Pilates as a form of building strength. "I can do things now that 3 years ago would have caused strain on my eyes."

Thankfully, Bianca's vision is currently stable, and she is down to five drops per day. Her doctors are encouraged by her progress and do not anticipate further intervention in the near future. Her trailer film for "Tunnel Vision" has been well received and she is currently working with a team to gain a larger audience with a streaming service. You can learn more about Bianca and watch "Tunnel Vision" on her website at thebiancabeach.com.



Glaucoma and Your Emotional Well-Being

If you have glaucoma, you may be experiencing emotional challenges in addition to the impact of glaucoma on your vision.

Emotions are a normal, healthy part of the human experience. Living with a chronic condition like glaucoma can cause you to feel a variety of emotions, including grief and loss. This may be due to an actual loss, such as loss of vision, or potential loss, such as a loss of what you thought your life was going to be like. Or, if you're anticipating losing your vision, you may be experiencing some of those emotions leading up to that loss. If you're going through multiple losses at the same time, that can become what is called complicated grief.

Depression, fear, worry, stress, and anxiety are also common emotions when dealing with glaucoma. If depression and anxiety are becoming debilitating, it's important to talk to your doctor and discuss whether you should seek help. There can also be feelings of shame or embarrassment, even self-blame, the sense that you brought this on yourself. There might also be guilt associated with that. But, like everyone else, you will experience happy emotions as well. Just because you are living with glaucoma doesn't mean that you can't also experience hope, joy, contentment, and gratitude.

Caregivers tend to also experience a unique type of stress and sometimes depression. 40% to 70% of caregivers have been shown to experience depression. So, if you are a caregiver having these kinds of emotions, and if you haven't talked to someone about it yet, this is a reminder to take care of your own emotional needs so you can continue to support others.

There are many ways to manage your emotional well-being. Pay attention to what helps you feel less stressed. There are a lot of things in our culture — societal pressures, advertisements, social media — that may not actually be useful for you, your life, and your situation. It's important to pay attention to what helps you feel less stressed and gives you a sense of peace and ease. Set boundaries to avoid toxic people in your life who consistently cause stress for you.

Daily self-care, moderate exercise, restful sleep, and healthy meals are also important. Find support and take control of your life where you can. Being an advocate for your own health care, asking your doctor questions, and getting involved in your treatment will help you feel more in control of your diagnosis.



ALLISON FINE, MSW, LICSW

Allison Fine is a clinical social worker supporting clients with both emotional and physical challenges in Seattle, WA. She founded the Center for Chronic Illness to better meet the emotional needs of those impacted by ongoing health challenges.

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