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THE LATEST ON GEOGRAPHIC ATROPHY

🔊 LISTEN TO THIS!

1 MILLION

Estimated number of people in the U.S. who have GA.

SOURCE: Cleveland Clinic

ARTIFICIAL INTELLIGENCE IN EYE CARE

Now that there are two FDA-approved medications for GA, doctors need better, more precise ways to monitor the condition and the medications' effects. AI may be the answer. Early signs of disease progression are subtle and almost undetectable on imaging reviewed by the human eye. Researchers are training computers to recognize these microscopic changes in the retina. Already, the machines can pick up on these clues faster and more accurately than their human teachers can. This technology could help identify patients in need of more frequent monitoring.

SOURCE: *Progress in Retinal and Eye Research*

DAMAGE CONTROL

Natural buildup of stress and damage on the body, called oxidative stress, is a key part of the disease process in dry AMD, which can lead to GA. Stem cells may stop this stress and potentially prevent damage that leads to dry AMD. In an experiment, when researchers delivered stem cell exosomes—tiny sacks of protein, DNA, and RNA that cells release—to AMD eyes, the ratio of helpful and harmful substances in the eyes flipped. Levels of inflammation and oxidative stress dropped and natural molecules that protect against stress and damage got a boost. This experiment could pave the way to new treatments for AMD.

SOURCE: *Journal of Controlled Release*

>8 MILLION

Estimated number of people in the world who have GA.

SOURCE: Cleveland Clinic

If your dry AMD has progressed to geographic atrophy (GA), don't delay

SLOW GA

with IZERVAY

AMD = age-related macular degeneration.



In 2 clinical trials of 624 people, IZERVAY was proven to slow GA progression by 18%-35% in one year compared to those who were not treated.

INDICATION AND IMPORTANT SAFETY INFORMATION

What is IZERVAY™?

IZERVAY (avacincaptad pegol intravitreal solution) is a prescription eye injection, used to treat geographic atrophy (GA), the advanced form of dry age-related macular degeneration (AMD).

What is the most important information I should know about IZERVAY?

Do NOT receive IZERVAY if you:

- Have an infection in or around your eye
- Have active swelling in or around your eye that may include pain and redness

IZERVAY can cause serious side effects:

- Eye injections like the one for IZERVAY can cause an eye infection (endophthalmitis) or separation of layers of the retina (retinal detachment).
- Call your healthcare provider right away if you have redness of the eye, eye pain, increased discomfort, worsening eye redness, blurred or decreased vision, an increased number of small specks floating in your vision, flashes of light, or increased sensitivity to light.
- There is a risk of developing wet AMD with IZERVAY. You should report any symptoms (visual distortions such as straight lines seeming bent, deterioration in vision, dark spots, loss of central vision) to your healthcare provider to monitor.
- IZERVAY may cause a temporary increase in eye pressure after the injection. Your healthcare provider will monitor this after each injection.

Before receiving IZERVAY tell your healthcare provider about all of your medical conditions including if you:

- Have a history of seeing flashes of light or small specks floating in your vision and if you have a sudden increase of size and number of these specks.

- Have high pressure in the eye or if you have glaucoma.
- Are pregnant or breastfeeding, think you may be pregnant, or are planning to have a baby, ask your doctor for advice before taking this medicine.
- Are taking any medications, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Tell your healthcare provider about any medicine you take.

What should I avoid while receiving IZERVAY?

- Your vision may be impaired after receiving an eye injection or after an eye exam. Do not drive or use machinery until your vision has recovered sufficiently.

What are the most common side effects of IZERVAY?

- Blood in the white of the eye
- Increase in eye pressure
- Blurred vision
- Wet age-related macular degeneration

These are not all the possible side effects of IZERVAY. Tell your healthcare provider about any side effect that bothers you or that does not go away.

Call your healthcare provider for medical advice about side effects. You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch, or call **1-800-FDA-1088**.

Please see next page for the Brief Summary of the full Prescribing Information for more information.

izervay[™]
(avacincaptad pegol
intravitreal solution) 2 mg

**ASK YOUR
DOCTOR
ABOUT IZERVAY**



Scan code or visit
IZERVAY.com to
learn more

Prescription Drug Facts

Rx Only**Active Ingredient**

IZERVAY (avacincaptad pegol intravitreal solution) Geographic Atrophy (GA) Treatment

Purpose**Use**

IZERVAY (ahy-zer-vay) is a prescription eye injection given by an eye care professional. IZERVAY is used to treat geographic atrophy (GA), the advanced form of dry age-related macular degeneration (AMD).

Do not receive treatment with IZERVAY if you:

■ have an infection in or around your eye ■ have active swelling in or around your eye that may include pain and redness

Warnings

Before you are treated with IZERVAY, tell your healthcare provider about all of your medical conditions, including if you:

■ have a history of seeing flashes of light or small specks floating in your vision and if you have a sudden increase of size and number of these specks ■ have high pressure in the eye or if you have glaucoma ■ are pregnant or breastfeeding, think you may be pregnant, or are planning to have a baby. Ask your doctor for advice before taking this medicine. ■ are taking any medications, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Tell your healthcare provider about any medicine you take.

Serious Side Effects

■ Eye injections like the one for IZERVAY can cause an eye infection (endophthalmitis) or separation of layers of the retina (retinal detachment). ■ Call your healthcare provider right away if you have redness of the eye, eye pain, increased discomfort, worsening eye redness, blurred or decreased vision, an increased number of small specks floating in your vision, flashes of light, or increased sensitivity to light. ■ There is a risk of developing wet AMD with IZERVAY. You should report any symptoms (visual distortions such as straight lines seeming bent, deterioration in vision, dark spots, loss of central vision) to your healthcare provider to monitor. ■ IZERVAY may cause a temporary increase in eye pressure after the injection. Your healthcare provider will monitor this after each injection.

What should I avoid while receiving IZERVAY?

■ Your vision may be impaired after receiving an eye injection or after an eye exam. Do not drive or use machinery until your vision has recovered sufficiently.

Most Common Side Effects

■ blood in the white of the eye ■ increase in eye pressure ■ blurred vision ■ wet age-related macular degeneration

Tell your healthcare provider if you have any side effect that bothers you or that does not go away. These are not all the possible side effects of IZERVAY.

Call your healthcare provider for medical advice about side effects. You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch, or call at 1-800-FDA-1088.

This information is not comprehensive. For more information, talk with your eye care professional or visit www.izervay.com.

LISTEN TO THIS!

PREPARING FOR YOUR DOCTOR'S APPOINTMENT

Be an active participant in the care for your GA

By Sonya Collins

Reviewed by Timothy Murray, MD,
WebMD Medical Reviewer**L**et's get you ready for your next GA appointment.**WHAT TO BRING**

Before your appointment, gather the following records for your eye specialist, says James C. Major Jr., MD, PhD, a retina specialist at Retina Consultants of Texas in Houston:

- Results of your last eye exam
- A list of all prescription and over-the-counter medications
- List of all past surgeries or procedures, eye-related or otherwise

“Bring someone to drive you home, too, because your eyes will most likely

need to be dilated,” Major says. “It’s also helpful to have that extra set of ears to absorb information.”

WHAT THE DOCTOR MIGHT ASK

First, your doctor may ask, “Has there been a sudden change in your vision or a slow degradation over time?” Major says.

Your doctor might also ask:

- Can you distinguish between two similar shades of the same color?
- How well do you see in low light?
- Can you recognize people and things in your central vision?

WHAT TO ASK THE DOCTOR

Arrive at the appointment with your own questions, too. Ask for clarification on anything that you don’t understand about your condition or your doctor’s recommendations for your care.

Here are some other questions you might consider asking:

- What changes in my vision should I watch out for?
- Is there anything I can do to slow the progress of this condition?
- What can I expect in the future and how should I prepare?

UNCOVERING GENES

Researchers zero in on a group of immune system proteins that may drive GA

By Sonya Collins

Reviewed by Timothy Murray, MD, WebMD Medical Reviewer

Genes play a big part in the development of AMD and your risk for geographic atrophy (GA). But experts don't understand exactly which genes are involved and how they raise your risk.

There's evidence that genes involved in the complement system—a group of proteins in your immune system that work together to fight disease and inflammation—are involved in the development of AMD. Genes regulate proteins, and researchers want to know whether the ones that regulate complement proteins have something to do with GA as well.

“When you have drugs targeted at the complement system that seem to slow the expansion of GA, then it obviously plays a role,” says Karl Csaky, MD, PhD, chief executive and medical officer at the Retina Foundation of the Southwest in Dallas.

LISTEN TO THIS!

THE COMPLEMENT SYSTEM AND GA

The complement system, a part of the immune system, fights disease by setting off the inflammation that helps kill disease-causing cells.

That's a good thing.

But in people with AMD, it's believed that the complement system mistakenly drives the inflammation that damages your retina and causes geographic atrophy. That includes the blind spots that arise in your central vision in advanced dry AMD, also known as GA.

When proteins are behaving badly—as they seem to do in advanced dry AMD/GA—researchers want to find the

FOOD FOR THOUGHT

Although your genes are inherited and unchangeable, you can make lifestyle adjustments to reduce your risk of GA:

- + **Stop smoking**
- + **Limit your time in the sun**
- + **Add fruits and vegetables to your diet**

genes that are controlling them.

“The complement system is clearly implicated in the disease. It has to be,” says Emily Y. Chew, MD, distinguished investigator at the National Eye Institute in Bethesda, MD. But what’s not known, she says, is exactly how. “It’ll be really crucial to learn the mechanism behind this.”

A better understanding of exactly which genes prompt the suspected malfunction in the complement system that leads to worsening AMD and eventually GA could pave the way for better treatment of the condition.

DRUGS THAT TARGET THE COMPLEMENT SYSTEM

Even with this limited understanding of how genes prompt the complement system to malfunction in AMD, there are drugs that interfere with this bad behavior.

“That’s what’s so intriguing about what seems to work—the anti-complement approach—since our limited understanding of the genetics of complement dysregulation don’t coincide with it being a major driver of GA expansion,” Csaky says.

In the anti-complement approach to GA, drugs called complement inhibitors block key proteins in the complement system to prevent them

from making GA worse. Right now, there are two FDA-approved complement inhibitors to treat GA. One blocks complement 3 (C3) and the other blocks complement 5 (C5). Recent studies have shown that these treatments can reduce the growth of GA.

Other complement inhibitors for GA are in development. Research is ongoing as to the specific genes that may be behind the wayward complement system in GA.

“It may be that gene mutations in the complement system have nothing to do with the biology of the disease,” Csaky says, “but that complement is a corrective system and that in AMD it could be dysregulated, and that’s why there’s an effect with anti-complement therapy.”

DID YOU KNOW?

Beyond your genetic makeup, there are other unmodifiable factors that may raise your risk for GA:

- + Age over 60
- + Being White
- + Having light eyes
- + Having vision of 20/200 or worse

 LISTEN TO THIS!

MY LIFE WITH GA

I've made adjustments and choose to be grateful.
Life is good.

By Wenke Holmes

Reviewed by Timothy Murray, MD,
WebMD Medical Reviewer

I have dry macular degeneration in both eyes and geographic atrophy in my right eye. The vision in my right eye is pretty much gone, while the other eye is staying the same. If I cover the good eye and look at you from a short distance with only my right eye, your face would be mostly black.

I've made some adjustments to be able to live with my vision loss, but my life goes on.

LEARNING ABOUT MY DIAGNOSIS

When I got my diagnosis, I didn't know what macular degeneration or geographic atrophy were. My doctor, Joan Miller, MD, at Mass General Brigham has helped me adjust just by being so calming and informative. And now, after reading, learning, and having the condition, I know a good bit more.

DAY-TO-DAY LIFE

I can still drive, but I'm more nervous driving in traffic. So I drive less and let my husband do most of the driving. When I do drive, I give myself more distance between cars.

I still read, but I need more light to read. I bought a lamp that another friend with macular degeneration suggested. It's small so I can move it easily around the house. And it has different kinds of light—like daylight, regular light, and high and low light. When I have good light, reading is no problem.

I've had to switch from taking steep hikes to going for regular walks because depth is hard for me. I fell a few times because I thought my foot was down when it wasn't.

I've got a magnifying glass that I can use if I go into a store where it's dark or if the price on an item is very small. It's also helpful for reading instructions on packaging because that can be in pretty small print sometimes.



DONLAND/VIA GETTY IMAGES;
INSET PHOTO COURTESY OF WENKE HOLMES

Occasionally, I may need to ask another customer in the store to read something on the label for me.

GRATITUDE

For the most part, I feel fortunate. I still travel. I go on with life. I don't worry about it or even think about it too much. Life is good.

WENKE'S TIPS



For those newly diagnosed with geographic atrophy:

- + Don't hesitate to get the devices you need to help you see.
- + Good lighting is the most important thing.
- + Remember that life goes on.

HOW TO ADVOCATE FOR CARE

Get informed and talk openly to medical team members you trust

By Kendall K. Morgan

Reviewed by Timothy Murray, MD, WebMD Medical Reviewer

When you have GA or are at risk, you'll want to do all you can to protect the vision you have. Address any modifiable risk factors by making healthy lifestyle changes. You'll also have treatment options to slow the progression of GA, including medicine your retina specialist can inject into your affected eye to slow the damage, says Abdhish R. Bhavsar, MD, an ophthalmologist at Retina Consultants of Minnesota and a spokesperson for the American Academy of Ophthalmology.

“The most important thing a patient can do after a geographic atrophy diagnosis is to ask questions,” Bhavsar says. “Talk to your ophthalmologist honestly about your current health and family history, the risks and benefits of any treatment options suggested, side effects, and likelihood of slowing blindness.”



COME PREPARED

Bhavsar recommends bringing a friend or family member along to doctor visits. Ask for their help in remembering important details and ask them to take notes.

“Oftentimes you don’t get a lot of time to talk with a specialist when you go for a visit,” says Preeti Subramanian, PhD, director of vision science research at the BrightFocus Foundation in Clarksburg, MD, a nonprofit dedicated to brain and eye health.

To get your most pressing questions asked and answered, write them down in advance. Take advantage of online resources between visits to learn

all you can. For instance, Subramanian says that the BrightFocus Foundation offers a monthly Macular Chat series (BrightFocus.org/Chats/Macular), in which you can listen and ask questions of vision doctors and scientists. “The more knowledge you have, the more empowered you will feel,” in discussing your options, Subramanian says.

FREQUENT VISITS

Subramanian recommends seeing your eye doctor or retina specialist for frequent and regular checkups to catch dry AMD or GA as early as you can and track its progression. In some cases, you may not notice symptoms, or they may continue to seem mild until it’s too late.

Unless you have an eye exam and more detailed imaging of your retina, there’s no way to know, Subramanian says. “There may be changes

occurring in the eye. By the time one has any symptoms such as blurriness in vision or loss of central vision, the disease has already progressed.”

The earlier you can get started with any recommended treatment, the better off you’ll be. Subramanian notes that the disease can vary a lot from one person to the next. “Progression can take many years, or it may be faster,” she says. “It’s important to work with a retina specialist to come up with a plan.”

HONESTY IS KEY

A low-vision specialist can help you adapt to any vision you’ve already lost, Bhavsar says. They’ll have access to resources, tools, and tips for making the most of your remaining vision. Whether you’re working with your ophthalmology or low-vision team, Bhavsar says the same general advice applies: “Ask questions and keep the communication open and honest. Your care team is there to help you make the best decisions for you.”

ASK AWAY

When you have GA or may be at risk, it’s important to ask questions. Here are a few to get you started:

- + **What lifestyle changes can I make to protect my vision?**
- + **What symptoms should I watch out for?**
- + **How often should I have a retina exam or imaging?**
- + **Should I start treatment or take part in a clinical trial?**

 LISTEN TO THIS!

RESOURCES AND SUPPORT FOR CAREGIVERS

Where to find answers when a loved one is at risk for vision loss

By Kendall K. Morgan

Reviewed by Timothy Murray, MD,
WebMD Medical Reviewer

When a loved one has GA, it can affect their vision over time. As a result, you may need to help them with driving, reading, or many other basic activities. A GA diagnosis comes with stress, financial concerns, and the worry that your loved one will lose their independence. But there is help available to make it easier on you both.

TAKE EARLY ACTION

Having a trusted doctor who really understands GA is a critical and time-sensitive first step. Offer to go along with your family member or friend to their appointment, and don't hesitate to ask any questions you have about the condition or what you can expect down the road.

“See a retinal specialist,” says Frank Brodie, MD, an ophthalmologist at the University of California San Francisco. “That’s the first place to go to understand where you are in the disease—how far along it is—and the risk factors for progression. They may see things in an exam and with imaging and can take steps to prevent vision loss early on.”

DECISION-MAKING SUPPORT

Make sure to talk with your loved one in advance about their preferences and any concerns they have when it comes to treatment. Brodie says that decisions about when to start new treatments aimed at preventing vision loss are something doctors, patients, and caregivers will need to work through together.

“Treatment includes an injection every month or every other month for the rest of your life,” he says. “You have to balance the burden and any risks of treatment against the benefits.”

SUPPORTS FOR LOW VISION

When your loved one has already lost vision, a low-vision specialist can help with testing and vision aids,

SEEK ASSISTANCE

If vision loss is limiting your loved one, look for community services that can help with:

- + Adjusting to vision loss
- + Skills of daily living
- + Independent living
- + Traveling safely
- + Assistive technologies

including magnifiers, smartphone apps, and more. Brodie says he sees it as a division of labor. Your retinal specialist will ensure your loved one will have the most vision they can for as long as possible, while your low-vision specialist can help your loved one make the most of the vision they have. Nicole Bajic, MD, an ophthalmologist at Cleveland Clinic's Cole Eye Institute in Ohio, also suggests reaching out to nonprofit or social service organizations near you.

"In many states, you'll find organizations dedicated to providing resources for people who are blind or visually impaired," Bajic says. "They often end up being the most valuable resource to help fill gaps you can't get from the eye doctor."

SOCIAL WORKERS AND SUPPORT GROUPS

Brodie advises asking your care clinic if they have social workers on staff who can help lighten your load while assisting your loved one in maintaining independence. Support

groups also are good places to look for information, get connected to resources in your community, and gain emotional support for your loved one as well as for yourself as a caregiver.

"Blindness and visual disability can be isolating," Bajic says. "It can be extremely difficult to have that happen to you. I actively encourage all patients with visual difficulties and their caregivers to go to support groups and seek out community services."

ONLINE RESOURCES

To learn more about GA and living well with vision loss, explore these resources:

- + American Foundation for the Blind
AFB.org
- + Prevent Blindness
PreventBlindness.org
- + American Macular Degeneration Foundation
Macular.org
- + BrightFocus Foundation
BrightFocus.org

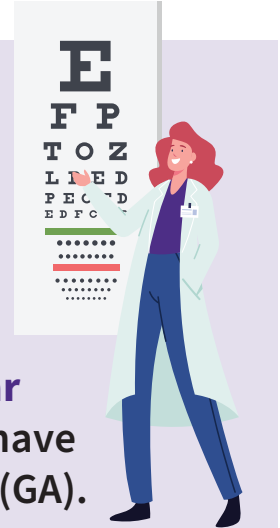
🔊 LISTEN TO THIS!

STATS & FACTS

By Sonya Collins
Reviewed by Timothy Murray, MD,
WebMD Medical Reviewer

1 IN 5

Number of people with advanced dry age-related macular degeneration who have geographic atrophy (GA).



1.4 TO 2.5

Number of years it can take for advanced GA to expand from noncentral to central vision.



70%

How much of your risk for GA is genetic.



30%

How much of your risk for GA is from age and environmental stressors such as smoking, poor diet, and excess sun exposure.



2 IN 3

Number of people with advanced GA without targeted treatment who can't drive within 2 years. Emerging treatments may change this.



SOURCES: *Journal of Clinical Medicine*, American Macular Degeneration Foundation, *Journal of Managed Care + Specialty Pharmacy*