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SPRING 2021

FIRST PERSON

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RECENT HEADLINES

KEEP UP WITH THE LATEST RESEARCH

HALLUCINATIONS EXPLAINED

Some people with vision loss due to macular degeneration have hallucinations (a condition called Charles Bonnet syndrome). The visions can cause people to worry they have dementia or mental illness. Doctors often misunderstand the problem, too. New research could help doctors distinguish between vision-loss-related hallucinations and other types. Researchers used electroencephalography (EEG) to

measure the brain activity of people with macular degeneration with and without hallucinations. They found that hyperactivity in the brain—possibly as it adapts to reduced vision—triggers the illusions. Doctors may one day use EEG to diagnose this type of hallucination. The researchers found that people don't mind the hallucinations as much once they understand the cause.

SOURCE: *Current Biology*



1 in 10

Estimated number of people whose macular degeneration is “wet” or exudative.

SOURCE: Bright Focus Foundation

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HOW GENES MAY PLAY A ROLE

A combination of lifestyle factors, such as smoking and diet, and your genes influence risk for macular degeneration. But doctors don't fully understand the role that genes play. A recent study may shed

some light. Scientists have discovered several gene variants, or versions, that are more common in people who have the disease. Identifying the genes that might trigger the condition could help researchers

develop treatments that target those genes. The discovery could also help doctors better evaluate risk in relatives of people who have macular degeneration.

SOURCE: *Nature Genetics*

11 million Estimated number of people in the U.S. who have age-related macular degeneration.

SOURCE: Bright Focus Foundation



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SKIP THE INJECTIONS

Researchers at Johns Hopkins University in Baltimore have developed a device for people with wet age-related macular degeneration that could mean no more needles in their eyes. A reservoir implanted in the eyes would continuously release medication. This could put a stop to monthly injections at the doctor's office. Instead, doctors would place the tiny medication-filled receptacle in the eye during a clinic visit and the patient would return for refills every six months.

SOURCE: *Ophthalmology*

KEEP LIVING LIFE THROUGH YOUR EYES

TAKE CONTROL OF YOUR SIGHT WITH EYLEA.

If Wet AMD has impacted your eyes—and how you see life—
fight back with EYLEA.

- EYLEA is **clinically proven to help improve vision**—which may help you read letters and see details more clearly
- EYLEA helped **maintain vision improvements for up to 4 years** with continued treatments in a clinical study

ASK A RETINA SPECIALIST ABOUT EYLEA.

INDICATIONS

EYLEA[®] (aflibercept) Injection 2 mg (0.05 mL) is a prescription medicine approved for the treatment of patients with Wet Age-related Macular Degeneration (AMD), Macular Edema following Retinal Vein Occlusion (RVO), Diabetic Macular Edema (DME), and Diabetic Retinopathy (DR).

IMPORTANT SAFETY INFORMATION

EYLEA[®] (aflibercept) Injection is a prescription medicine administered by injection into the eye. You should not use EYLEA if you have an infection in or around the eye, eye pain or redness, or known allergies to any of the ingredients in EYLEA, including aflibercept.

Injections into the eye with EYLEA can result in an infection in the eye and retinal detachment (separation of retina from back of the eye) can occur. Inflammation in the eye has been reported with the use of EYLEA.

In some patients, injections with EYLEA may cause a temporary increase in eye pressure within 1 hour of the injection. Sustained increases in eye pressure have been reported with repeated injections, and your doctor may monitor this after each injection.

There is a potential but rare risk of serious and sometimes fatal side effects, related to blood clots, leading to heart attack or stroke in patients receiving EYLEA.



#1 **FDA-APPROVED** treatment in its class
for patients with Wet AMD*

The most common side effects reported in patients receiving EYLEA were increased redness in the eye, eye pain, cataract, vitreous (gel-like substance) detachment, vitreous floaters, moving spots in the field of vision, and increased pressure in the eye.

You may experience temporary visual changes after an EYLEA injection and associated eye exams; do not drive or use machinery until your vision recovers sufficiently.

Contact your doctor right away if you think you might be experiencing any side effects, including eye pain or redness, light sensitivity, or blurring of vision, after an injection.

For additional safety information, please talk to your doctor and see the full Prescribing Information for EYLEA.

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 the Consumer Brief Summary on the adjacent page.

*IBM Truven MarketScan data: Number of injections administered, from Q4 2018 through Q3 2019; Data on File.

VISIT EYLEA.COM

Consumer Brief Summary

This summary contains risk and safety information for patients about EYLEA. It does not include all the information about EYLEA and does not take the place of talking to your eye doctor about your medical condition or treatment.

What is EYLEA?

EYLEA is a prescription medicine that works by blocking vascular endothelial growth factor (VEGF). VEGF can cause fluid to leak into the macula (the light-sensitive tissue at the back of the eye responsible for sharp central vision). Blocking VEGF helps reduce fluid from leaking into the macula.

What is EYLEA used for?

EYLEA is indicated for the treatment of patients with:

- Neovascular (Wet) Age-Related Macular Degeneration (AMD)
- Macular Edema Following Retinal Vein Occlusion (RVO)
- Diabetic Macular Edema (DME)
- Diabetic Retinopathy (DR)

How is EYLEA given?

EYLEA is an injection administered by your eye doctor into the eye. Depending on your condition, EYLEA injections are given on different schedules. Consult with your eye doctor to confirm which EYLEA schedule is appropriate for you.

Who should not use EYLEA?

Do not use EYLEA if you have an infection in or around the eye, eye pain or redness, inflammation in the eye, or are allergic to aflibercept and/or any other ingredients in EYLEA.

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

- EYLEA must only be administered by a qualified eye doctor. Injection into the eye with EYLEA can result in an infection in the eye and retinal detachment (separation of retina from back of the eye) can occur. Inflammation in the eye has been reported with the use of EYLEA. If your eye becomes red, sensitive to light, painful, or develops a change in vision, seek immediate care from an eye doctor
- In some patients, injections with EYLEA may cause a temporary increase in eye pressure within 1 hour of the injection. Sustained increases in eye pressure have been reported with repeated injections, and your eye doctor may monitor this after each injection
- There is a potential but rare risk of serious and sometimes fatal side effects related to blood clots, leading to heart attack or stroke in patients receiving EYLEA
- Serious side effects related to the injection procedure with EYLEA are rare but can occur including infection inside the eye and retinal detachment
- You may experience temporary visual changes after an EYLEA injection and associated eye exams; do not drive or use machinery until your vision recovers sufficiently
- Because EYLEA is composed of large molecules, your body may react to it; therefore, there is a potential for an immune response (allergy-like) in patients treated with EYLEA

What are possible side effects of EYLEA?

EYLEA can cause serious side effects, including

- See important safety information listed under “What is the most important information I should know about EYLEA?”

The most common side effects include

- Increased redness in the eye
- Eye pain
- Cataract
- Vitreous (gel-like substance) detachment
- Vitreous floaters
- Moving spots in the field of vision
- Increased pressure in the eye

There are other possible side effects of EYLEA. For more information, ask your eye doctor.

It is important that you contact your doctor right away if you think you might be experiencing any side effects, including eye pain or redness, light sensitivity, or blurring of vision, after an injection.

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.

What should I tell my eye doctor before receiving EYLEA?

- Tell your eye doctor if you have any medical conditions
- Tell your eye doctor if you are pregnant or are planning to become pregnant. It is not known if EYLEA may harm your unborn baby
- Tell your eye doctor if you are breastfeeding. It is not known if EYLEA may harm your baby. You and your eye doctor should decide whether you should be treated with EYLEA or breastfeed, but you should not do both

How is EYLEA supplied?

EYLEA is supplied in a clear, colorless to pale yellow solution. It is provided in a pre-filled glass syringe or glass vial containing the amount of product required for a single injection into the eye, which is 0.05 mL (or 2 mg of the medicine product).

Where can I learn more about EYLEA?

For a more comprehensive review of EYLEA safety and risk information, talk to your health care provider and see the full Prescribing Information at EYLEA.com.

REGENERON

Manufactured by:

Regeneron Pharmaceuticals, Inc.
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Tarrytown, NY 10591

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Issue Date: November 2020

Initial U.S. Approval: 2011

based on the August 2019 EYLEA® (aflibercept) injection full Prescribing information.

WAMD

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LEARN MORE ABOUT WHAT CAUSES WET AMD, HOW IT AFFECTS YOUR EYES, AND HOW TO MANAGE IT

By Rachel Reiff Ellis

Reviewed by Alan Kozarsky, MD, WebMD Medical Reviewer

Age-related macular degeneration (AMD) is the leading cause of vision loss in adults over age 50 in the U.S. The macula is a small densely packed area of nerve cells in the middle of your retina responsible for sharp central vision. Macular degeneration damages this bundle of cells and along with it your ability to see clearly.

WET VS. DRY AMD

AMD has three stages: early, intermediate, and late. Your vision isn't typically affected until you reach late-stage AMD. Late-stage AMD has two subtypes: wet (also called neovascular) and dry (also called geographic atrophy). You can have one type only or both at the same time in one or both eyes.

Dry AMD affects your vision by slowly breaking down the cells and tissues in and around your macula. In wet AMD, macula damage hap-

pens because of new, abnormal blood vessels that grow behind your retina. "The term wet refers to the bleeding or leaking from this mesh of abnormal blood vessels," says Eugene Y. Shildkrot, MD, associate professor of ophthalmology and co-director of the Retina Fellowship Program at the University of Virginia School of Medicine. This fluid buildup in and under your retina causes it to swell and affect your sight.

The majority of people with late-stage AMD have the dry type. "Dry macular degeneration is by far the most common subtype, outnumbering the wet type nearly 4 to 1," says Shildkrot. Although the wet type is rarer, it accounts for the majority of cases of AMD-caused vision loss.

SYMPTOMS

The symptoms of wet AMD come on more quickly and are typically more severe than the symptoms of dry AMD. “Unlike the dry type, which tends to be slow in progression, wet macular degeneration can have a very sudden onset,” Shildkrot says. Often you’ll have a large dark or empty spot in the center of your field of vision, but you may have other effects, such as trouble seeing colors correctly, objects appearing the wrong shape or size, or blurry vision.

“You may have difficulty seeing faces or the center of a clock, or straight lines may appear warped,” says Shildkrot. If you have wet AMD in one eye, he notes, it increases the chances that the other eye will also develop it.

DIAGNOSIS

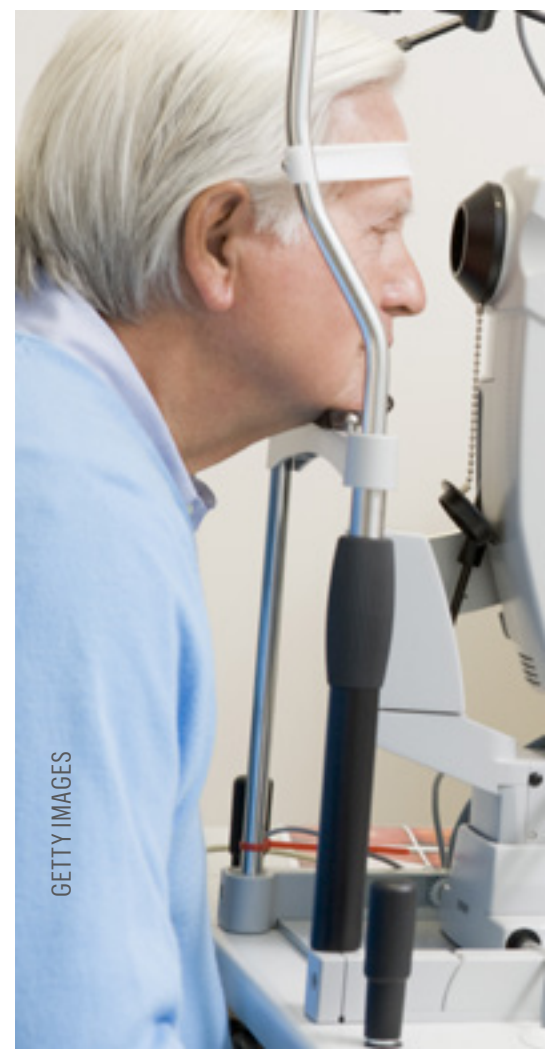
To know whether you have wet AMD, you’ll need to have a clinical exam by an eye specialist. Using a visual acuity test, your doctor can see how sharp your vision is at various distances. You may also look at an image called an Amsler grid to determine if straight lines appear wavy. Your doctor will dilate your eyes to see if there is fluid buildup under your retina.

Your doctor may also take photographs of your retina (called fundus photography), do a laser scan of the retina (an optical coherence tomography, or OCT), or look at the blood vessels of your retina with a test called an angiography. “Angiography helps us observe blood vessel leakage in real time by injecting dye through a vein in the arm that eventually reaches the

neovascular membrane,” says Shildkrot. This neovascular membrane is the mesh-like collection of abnormal blood vessels under your retina.

TREATMENT

The most common treatment is regular injections into the eye with anti-VEGF drugs. “These medications decrease the growth factors responsible for neovascular mem-



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brane formation and maintenance,” Shildkrot says. Anti-VEGF drugs help stop new abnormal blood vessels from growing.

Other, less common options your doctor may try in combination with anti-VEGF injections is treatment with lasers. They may suggest laser therapy, which uses a beam projected into your eye to stop new blood vessel growth, or laser

surgery with a different kind of beam that destroys abnormal blood vessels.

There is no cure for AMD, but with the right care, you may slow the progression of the disease. “Early detection and prompt treatment within a week of conversion to the ‘wet’ macular degeneration are both key to maintaining or improving your vision,” Shildkrot says.

“THE TERM WET REFERS TO THE BLEEDING OR LEAKING FROM THIS MESH OF ABNORMAL BLOOD VESSELS.”

- Eugene Y. Shildkrot, MD

RAISED RISK

These factors increase your odds of getting wet AMD:

- + **Family history.** If a relative has or had AMD, it's more likely you'll get it.
- + **Race.** AMD is more common in people who are white.
- + **Smoking.** Studies show smoking cigarettes can double your risk of AMD.
- + **Genetics.** Certain gene variants, or versions, may be associated with AMD.



LOSING SIGHT

AN UNUSUAL VISION CHANGE LED ONE MAN TO HIS EYE DOCTOR—AND A SURPRISING DIAGNOSIS

By Fred Watson

Reviewed by Alan Kozarsky, MD,
WebMD Medical Reviewer

In the mid-1980s, I was going to engineering school in Newark, NJ. I noticed that I was having a little trouble reading the textbooks. I thought I needed glasses, so I visited an optometrist. He gave me a field of vision test. There were a number of pinholes through which lights would shine. Whenever I saw a light come on, I had to press a button. I wasn't able to see some of the lights. My doctor told me that some areas of my vision were dead, and he recommended that I see a specialist.

The specialist took pictures of my eyes with a camera and a bright light but didn't discover anything. A few years later, as I was sitting

on the porch of my shore house, I saw a strange little twirl in the middle of the telephone wire out front. It had a twist in it that shouldn't have been there.

I went to another specialist, who diagnosed me with age-related macular degeneration (AMD). There are two forms: wet and dry. I had the dry form. The doctor recommended that I start taking special vitamins to slow the disease and to look at an Amsler grid every day to see if the lines became wavy—a sign that my AMD was getting worse.

I was seeing my doctor periodically to monitor my AMD and check whether anything had changed. One day, after he took pictures of my eyes, he called me into

his office. He showed me the pictures, noting where blood vessels under my retina were leaking. In my right eye, dry macular degeneration had changed into the wet type.

Whenever I would look straight at the tiny light on my TV set or smoke detector, the light would disappear. That was my central vision starting to go. My doctor put me on injections of a drug to block the spread of abnormal blood vessels in my eye.

About two years ago, the TV screen turned wiggly, and the crawl across the bottom moved up and down to the point where I couldn't read it. I told my wife, "I think something's wrong." I'd developed wet macular



GETTY IMAGES; INSET PHOTO COURTESY OF FRED WATSON

degeneration in my left eye. I got a shot in the second eye, and within two days, my vision had improved.

I continued to get shots in both eyes once a month until my doctor felt comfortable that my vision had stabilized enough to start spacing them out. Now I get injections every eight to nine weeks. I also had cataract surgery in both eyes.

Today, I see pretty well. I'm able to drive at night, which used to

bother me. I carry glasses with me to use if I have to read something up close, but most of the time I don't. Now I'm trying to get my grown children to be more proactive about their vision. At a family gathering, I learned that several of my cousins also had macular degeneration. Because of our family history, I urged my kids to start taking the supplements that are recommended to help protect vision in people with this condition.



FRED'S TIPS

Wear shades.

Sunglasses with UVA/UVB protection block those dangerous rays.

Supplement your diet.

If you're at risk for AMD, or you have the dry type, ask your doctor about taking supplements containing nutrients like lutein, zeaxanthin, and zinc to protect your vision.

Check your grid.

After you're diagnosed with AMD, use the Amsler grid as a guide to check whether your vision is getting worse. If the lines look wavy or fuzzy, call your eye doctor.

FOODS THAT HELP

HOW YOUR DIET CAN HELP SLOW SYMPTOMS

By Rachel Reiff Ellis

Reviewed by Brunilda Nazario, MD, WebMD Lead Medical Director

Though a healthy diet cannot reverse wet age-related macular degeneration, eating certain foods—and avoiding others—can help put the brakes on its progression. “Diet is a very integral part of health in general, but also for vision health, and for the retina in particular,” says Avnish Deobhakta, MD, assistant professor of ophthalmology and vitreo-retinal surgery at New York Eye and Ear Infirmary of Mount Sinai. He says the key is to first cut out the foods that can hurt you, then bump up your eating of those that are most beneficial for your eyes.

WESTERN DIET WOES

When it comes to boosting eye health, antioxidants called carotenoids are essential, especially two: lutein and zeaxanthin. “Both are very much needed for the retina to function over time well,” Deobhakta says. “As you get older, you don’t really produce or keep much of them, so it’s up to you to keep it up through diet.”

Unfortunately, a typical Western diet—high amounts of red meat, processed foods, fried items, desserts, eggs, refined grains, high-fat dairy, and sugar-sweetened beverages—is low on carotenoids. And it’s

rough on your vision in other ways, too. “Western diet foods generate a lot of inflammation in the body, which is a problem because the main thing that destroys the retina in macular degeneration is deposits of inflammatory debris,” Deobhakta says.

WHAT TO EAT

A better diet choice is one experts call the “prudent pattern.” Typical foods for this way of eating includes lots of veggies, especially dark



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leafy greens, colorful fruits, legumes, oils, whole grains, poultry, fish, and low-fat dairy. “In a major study defining these two different kinds of diet, those who followed the prudent pattern had a really great response to reducing risk to late AMD,” Deobhakta says. Fish offer omega-3 fatty acids, too, another important part of an eye-healthy diet.

Although foods are the best place to get antioxidants, doctors may also prescribe “eye

vitamins” called AREDS2 in certain cases, to pump up your levels of lutein and zeaxanthin as well as copper, zinc, and vitamins C and E. “If we know someone has a form of macular degeneration that might progress to wet or late stage, we give them AREDS2 vitamins, twice a day,” Deobhakta says. “But it’s much better to get these antioxidants in your diet, especially if it helps you develop a healthy eating strategy long term.”

GO GREEN

Work these leafy greens into what you eat for the highest doses of lutein, zeaxanthin, and carotenoids, says Avnish Deobhakta, MD.

Kale

Steam it, cook it, bake it, or eat it raw. This leafy green is good in soups, salads, or on its own as crispy kale chips.

Spinach

Softer than kale, spinach is used as a garnish on top of veggie burgers and to bulk up a tasty salad, or blend into a smoothie. You can sauté it as well.

Collards

Collards can be bitter, so sauté them with olive oil for a long time. Add a tiny pinch of sugar before serving.

Turnip greens

The leaves of turnips are great sautéed in oil and eaten on their own, or you can add them to any salad.



DEVICES AND TECH BRIGHTEN THE DARK SPOTS IN AMD

THESE TOOLS CAN HELP YOU MANAGE AGE-RELATED MACULAR DEGENERATION

By Sonya Collins

Reviewed by Alan Kozarsky, MD, WebMD Medical Reviewer

Wet age-related macular degeneration blurs or blacks out central vision. High-tech gadgets, apps, and even tweaks to your own devices can help close the gap in your eyesight.

The best approach to finding technology that will help you is to start with the settings on your personal devices, then move along to apps and software,

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and finally—if needed—consider additional gadgets that offer more assistance—but at a higher price.

NOT YOUR GRANDMA'S MAGNIFYING GLASS

A handheld magnifying glass is no longer the tool of choice when it comes to vision-enhancing equipment. “Digital platforms on mainstream devices

offer far superior lighted magnification,” says Diane B. Whitaker, OD, division chief of vision rehabilitation and performance at Duke Eye Center in Durham, NC. “Why use a limited capacity, old-school tool when you have a very valuable tool in your pocket or purse?”

Accessibility settings on any smartphone

offer options to have text read to you; enlarge letters and images on your screen; and increase your screen's contrast. For people who are light-sensitive, reverse contrast settings put white letters against a black background, which is easier on the eyes.

“Whether you have early- or advanced-stage macular degeneration, your two best friends are going to be magnification and contrast enhancement,” Whitaker says. You, or an occupational therapist, can make these adjustments to all your other electronics too.

APPS THAT SEE FOR YOU

Dozens of free and cheap apps can help you see the world beyond your phone's screen. Among Whitaker's favorites are Seeing AI and AIRA.

Seeing AI converts anything your phone's

camera “sees” into audio information. You could walk into a room and the app would say, “Kitchen scene, white cabinets, black and white tile floor.” It recognizes barcodes, so when you pick up an item in a store, the app tells you, for example, that you’re holding a specific brand’s box of cereal. It can even describe faces it sees.

AIRA connects you with a live, trained professional who can see through your phone’s camera. Let’s say you’re in a clothing store and you don’t want to buy a

dry-clean only shirt. You would open the app and ask a real person to read the care instructions to you.

HIGH-TECH WEARABLES

OrCam MyEye works similarly to Seeing AI. It’s a discreet device that attaches to any pair of glasses. It uses artificial intelligence to convert visual stimuli into audio text. That means it can read to you, help you shop using barcodes, and describe faces and scenes.

The eSight headset uses high-speed video

cameras to create and show you an image that you can see despite your vision impairment. It works with many different types of vision loss, including age-related macular degeneration. While you’re wearing the headset, you will see the world around you.

For now, health insurance doesn’t cover wearable devices for the vision impaired. These gadgets range from about \$2,000 to \$10,000—which is why the device in your pocket may be the best place to start.



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