

What You Need to Know About ...

Diabetic Macular Edema



What You Need to Know About Diabetic Macular Edema

If you or someone you care about has diabetes, you may be familiar with these statistics: More than 29 million people in the United States—9.3% of the population—have diabetes.¹ What you may not know is that diabetes is the leading cause of new cases of blindness among adults between the ages of 20 and 74.² Between 2005 and 2008, 28.5% of people with diabetes 40 years of age or older had diabetic eye disease that could lead to vision loss, and 4.4% had advanced diabetic eye disease, such as diabetic macular edema, that could lead to severe vision loss.¹ With early detection, however, diabetic eye disease can be treated to improve vision. This booklet provides important information about diabetic macular edema for patients, family members, and caregivers.

How does diabetes affect the eyes and vision?

People with diabetes have too much glucose, a sugar, in their blood. This happens when the pancreas cannot make enough insulin, a hormone that regulates blood sugar, or because the body's cells don't respond normally to insulin. When blood sugar remains high over a long period, complications can occur throughout the body, including the eyes.³

What is diabetic retinopathy?

Diabetic retinopathy is the most common diabetic eye disease. It is caused by changes in the blood vessels of the retina, which is the light-sensitive tissue in the back of the eye. As the disease progresses, blood vessels can become blocked and prevent parts of the retina from receiving a supply of blood and nutrients. Blood vessels can also swell and leak fluid into the macula, the highly sensitive area of the retina responsible for sharp, central vision.⁴

What is diabetic macular edema?

Diabetic macular edema, also called DME, is a complication of diabetic retinopathy. It is the term used to describe swelling of the macula, which can affect your vision. DME can occur at any stage of diabetic retinopathy but is more likely to occur as the disease progresses. (See "Stages of Diabetic Retinopathy.") Diabetic macular edema develops

gradually and may not have symptoms in the early stages, but over time, it may lead to vision loss.⁴

Stages Of Diabetic Retinopathy⁴

Mild Nonproliferative

Small areas of swelling develop in the tiny blood vessels that nourish the retina.

Moderate Nonproliferative

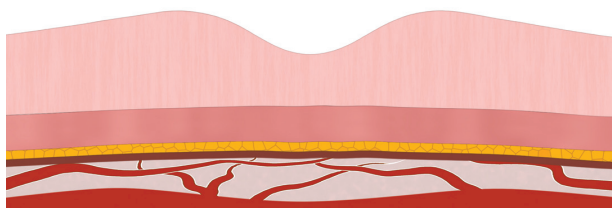
Some blood vessels are blocked.

Severe Nonproliferative

Many more blood vessels are blocked, depriving areas of the retina of their blood supply. These areas of the retina send signals to the body to grow new blood vessels for nourishment

Proliferative

New vessels that are abnormal and fragile grow along the retina and along the surface of the clear, vitreous gel that fills the inside of the eye. If these vessels leak blood, severe vision loss and even blindness can result.



Normal retina

What are the symptoms of diabetic macular edema?

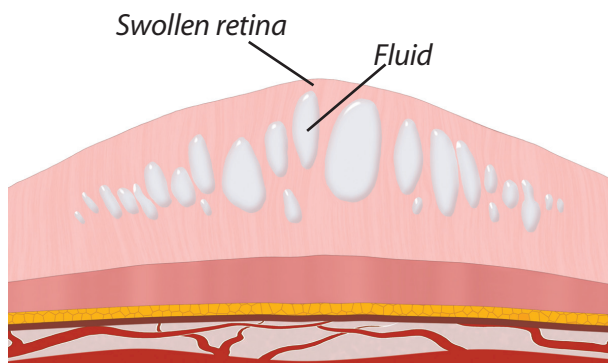
Diabetic macular edema may have no symptoms or warning signs, which is why people with diabetes need to have their retinas examined at least once a year. If you experience any of the following symptoms, you should see your eye doctor immediately:

- Blurred or double vision
- Dark spots or “floaters” in the vision
- Straight lines that looked crooked
- Washed out colors.

Unfortunately, symptoms often become noticeable only after the disease has reached an advanced stage. Early detection and timely treatment can prevent vision loss.⁴



If your vision becomes blurry or you see dark spots, contact your eye doctor immediately.



Retina with diabetic macular edema

Do people who have diabetes always get diabetic macular edema?

People with type 1 or type 2 diabetes are at risk for diabetic macular edema, but they can take steps to minimize the risks and potentially preserve their vision.

What are the risk factors for diabetic macular edema?

The major risk factors for diabetic macular edema are severity of diabetic retinopathy, duration of diabetes, high blood sugar, high blood pressure, and high lipid levels.^{5,6} Potential risk factors include: diabetic nephropathy, anemia, sleep apnea, glitazone usage, and pregnancy.⁶

If I have diabetes, can I reduce my risk for diabetic macular edema?

The best way to reduce your risk for diabetic macular edema is to control your diabetes by doing the following:

- Make sure your blood sugar levels (HbA1c) are within your target range every day.
- Use your diabetes medicine as directed by your healthcare professional.
- Eat nutritious foods in moderation, and exercise





regularly to maintain a healthy weight.

- Keep your blood pressure in the normal range.
- Don't smoke tobacco.
- See your retina specialist at least once a year for a dilated eye examination. With regular eye examinations, the earliest signs of diabetic eye disease can be detected before your vision is affected.

What kind of eye doctor should I see for my diabetic macular edema?

Diabetic macular edema is a disease of the retina, so it's important to be examined and managed by a retina specialist. A retina specialist is an ophthalmologist, a medical doctor, who has completed an additional 1 or 2 years of fellowship training to diagnose and treat diseases of the retina. You may need to continue to also see a general ophthalmologist or an optometrist if you need your vision corrected with eyeglasses or contact lenses.

What tests will my eye doctor use to detect diabetic macular edema?

In addition to checking your vision using an eye chart and measuring your eye pressure during a comprehensive eye examination, your eye doctor will use dilating drops to widen your pupils so he or she can see all of the structures inside your eyes, including the retina and the macula.

If your regular eye doctor suspects you have diabetic macular edema, he or she may refer you to a retina specialist to confirm the diagnosis and start treatment. The retina specialist may repeat these tests and will also perform additional tests, including color photographs of the retina, called *fundus photographs*, and an imaging test called *fluorescein angiography*. During fluorescein angiography, a dye is injected into the arm, and a series of photos are taken as the dye passes through the blood vessels in the retina. This test helps the retina specialist identify any closed, damaged, or leaking blood

EXAMPLE OF A FUNDUS PHOTOGRAPH



EXAMPLE OF A FLUORESCIN ANGIOGRAM



vessels. Another imaging test called *optical coherence tomography* (OCT) shows a cross-section of the retina and reveals any unusual swelling of the tissue.

Is there a treatment for diabetic macular edema?

Yes! That's the good news. Over the last several years, scientists have developed new treatments for diabetic macular edema. The newest drugs are called anti-VEGF agents. Your doctor may also use steroids or laser therapy, perhaps in combination with anti-VEGF therapy, to treat the leaking blood vessels.

What do these treatments do?

Anti-VEGF Drugs. Vascular endothelial growth factor, or VEGF, is a protein that occurs naturally in the body. At normal levels, VEGF is beneficial, but when blood sugar is too high for long periods, the body makes too much VEGF. This excess VEGF binds to blood vessels and causes leaky blood vessels. Anti-VEGF drugs bind to VEGF and block this process.

Anti-VEGF drugs are administered by injection. After numbing the eye, the retina specialist uses a very fine needle to inject the drug into the central cavity of the eye. Your retina specialist will review the entire procedure and any potential side effects.

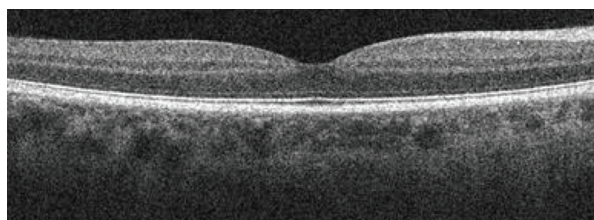
Steroids. Steroids can reduce swelling and inflammation. Steroids are also delivered by injection.

Laser. Laser photocoagulation, either focused on individual small areas on the retina or scattered over a wider area, uses a beam of light to seal off or destroy leaking vessels to prevent further vision loss.

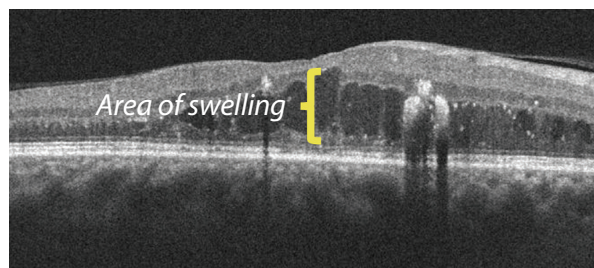
Retina specialists often combine or alternate these treatments, depending on how your retina and your vision respond.

All treatment options for diabetic macular edema have possible risks and benefits. Talk to your retina specialist to see if a treatment is right for you.

EXAMPLE OF OPTICAL COHERENCE TOMOGRAPHY (OCT)



Normal retina



Retina with diabetic macular edema

How long will I have to have treatment?

Diabetic macular edema is a chronic condition that requires lifetime monitoring and treatment. Repeated doses of an anti-VEGF agent, a steroid, laser therapy, or a combination of treatments may be needed to manage diabetic macular edema.

Is there a cure for diabetic macular edema?

There is no cure for diabetic macular edema, but early detection and timely treatment may help prevent vision loss.

What if I've already lost some vision because of diabetic macular edema?

Even if you have lost some vision from diabetic macular edema, you can maintain your independence and quality of life with the help of low vision aids. Ask your general ophthalmologist or your retina specialist for a referral to a low vision specialist who can help you make the most of your remaining vision and teach you new ways to perform everyday tasks. Organizations such as those listed on page 7 are excellent resources to learn about research and therapies for diabetic macular edema, as well as new products and services for people who have low vision. ■

PROTECTING YOUR VISION IS A TEAM EFFORT



If you have diabetes, be sure to work with your entire care team—primary care physician, retina specialist, endocrinologist, nephrologist, nutritionist—to help you manage it. Remember these key facts about your vision:

- Better control of blood sugar levels may slow the onset and progression of any diabetic complication.⁷
- If you have diabetes, you should have your eyes examined once a year.⁴
- Diabetic macular edema can develop without symptoms at any stage of diabetic retinopathy.⁴
- A general ophthalmologist or a retina specialist can tell if you have diabetic macular edema. Early detection and timely treatment can prevent vision loss.⁴

Where can I get more information about diabetic eye disease?

Your retina specialist and your general ophthalmologist are your primary sources for the latest information about diabetic eye disease. The following are trusted sources for general information:

American Academy of Ophthalmology

www.aao.org

Lighthouse International

www.lighthouse.org

American Diabetes Association

www.diabetes.org

National Diabetes Information Clearinghouse

www.diabetes.niddk.nih.gov

American Society of Retina Specialists

www.asrs.org/patients/retinal-diseases/3/diabetic-retinopathy

National Eye Institute of the National Institutes of Health

www.nei.nih.gov/health/diabetic/retinopathy.asp

Juvenile Diabetes Research Foundation

www.jdrf.org

Patient Access Network Foundation

www.panfoundation.org

References

1. Centers for Disease Control and Prevention. National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States, 2014. Atlanta, GA: U.S. Department of Health and Human Services, 2014.
2. Centers for Disease Control and Prevention. National Diabetes Fact Sheet: National Estimates and General Information on Diabetes and Prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.
3. U.S. National Library of Medicine. A.D.A.M. Medical Encyclopedia. <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002194/>. Accessed June 26, 2014.
4. National Eye Institute of the National Institutes of Health. "Facts About Diabetic Retinopathy." <http://www.nei.nih.gov/health/diabetic/retinopathy.asp>. Accessed June 3, 2014.
5. Danis RP. Diabetic macular edema. In: Albert DM, et al., eds. *Albert & Jakobiec's Principles and Practice of Ophthalmology*. 3rd ed. Philadelphia, PA: WB Saunders; 2008:1793-1806.
6. Diep, T, Tsui, I. Risk factors associated with diabetic macular edema. *Diabetes Res Clin Pract*. 2013;100:298-305.
7. The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med*. 1993;329:977-986.

Questions to Ask Your Retina Specialist About Your Diagnosis

Before you see your retina specialist, be sure to write down any questions you may have about your eyes and your vision. Here are some suggestions:

1. What is my diagnosis? (Ask your doctor to spell any unfamiliar words.)
2. Can this disease be treated?
3. If you are recommending treatment, what is your treatment plan? When will treatment start?
4. If you are not recommending treatment at this time, how often should I return for a check-up?
5. What is my prognosis?
6. What symptoms should I watch for? What should I do if they occur?
7. Can I make any lifestyle changes to improve my prognosis?

