

Diabetic macular edema

Diabetic macular edema (DME) is swelling of the macula, or central retina, in patients with diabetes mellitus. The retina is like the film in a camera, and the central part of the retina is the most important for detailed central vision. The retina is fed by a tree of blood vessels. Diabetes affects the blood vessels in the eye and may cause them to leak. When fluid leaks out of the retinal blood vessels, it collects in the retina and causes the retina to swell like a sponge. When the retina is swollen, central vision may be blurred or distorted.

Who gets diabetic macular edema

Diabetic macular edema is the leading cause of vision loss in patients with diabetes mellitus. DME is more likely to occur with longer duration of diabetes and poor control of diabetes. High blood pressure also increases the risk of DME.

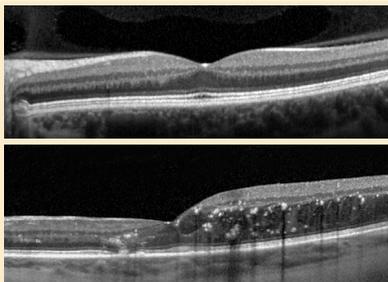
Vision loss from diabetic macular edema tends to occur gradually over time. Diabetic changes in the retina are almost always visible before diabetic macular edema occurs, which is why regular examination of the retina is important for all diabetic patients. It is easier to maintain good vision by preventing DME in the first place rather than treating it after it occurs.

How is diabetic macular edema diagnosed?

Because several different diseases can produce blood or fluid in the central retina, your retina specialist will usually order tests to confirm the diagnosis of diabetic macular edema and/or guide decision-making over the course of your care.

Optical coherence tomography (OCT) is a fast, non-invasive scan of the retina which measures and locates fluid in and behind the retina. *Fundus photography* is the use of high resolution photographs to document the tissue appearance. *Fluorescein angiography (FA)* identifies leakage of fluid under and within the retina with a series of photographs taken after intravenous injection of fluorescein dye.

Your BARA doctor will use these diagnostic tests to monitor the response of disease to treatment over time. OCT is used to monitor changes most frequently, while the other tests are repeated less often.



In diabetic macular edema, the normal thickness and contour of the central retina (shown above) are replaced by swelling (shown below) which can blur the vision. This edema (swelling) is caused by leakage of fluid from retinal blood vessels that are damaged by diabetes. Chronic swelling can result in permanent damage, and most treatments aim to reduce swelling as much as possible.



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Treatment of diabetic macular edema

Treatment of diabetic macular edema falls into four broad categories, described below. None of these treatments will result in a permanent cure for diabetic macular edema, and ongoing treatment is usually needed in order to prevent vision loss. If the underlying diabetes is not adequately controlled, vision loss may result despite aggressive treatment. The recommended treatment is sometimes based on diagnostic tests such as fluorescein angiography and sometimes based on conditions such as cataract or glaucoma that increase the risks of certain treatments. Your BARA doctor will discuss the most appropriate treatment options for your particular case.

Anti-VEGF medications are non-steroid medications that suppress leakage or proliferation by damaged blood vessels. These medications are injected into the eye as often as once a month. There are three anti-VEGF medications currently used to treat diabetic macular edema, all of which are safe and effective:

Bevacizumab (**Avastin**) has been used off-label in the eye for more than 15 years.

Ranibizumab (**Lucentis**) is FDA approved and is very similar to bevacizumab.

Aflibercept (**Eylea**) is FDA approved and works slightly differently than bevacizumab and ranibizumab.

Steroid injections can last several months at a time. They carry a risk of cataract progression or elevated eye pressure. Steroids can be used in combination with anti-VEGF medication in some cases. There are four steroid medications currently used to treat diabetic macular edema:

Subtenon steroid (**triamcinolone**) is a steroid injection around the side of the eye, under the stretchy clear tissue on the outside of the eye.

Intravitreal triamcinolone (**Triescence**) is an injection of steroid particles into the eye.

Intravitreal dexamethasone (**Ozurdex**) is an injection of a tiny solid slow-release implant into the eye.

Fluocinolone acetonide (**Iluvien**) is an injectable pellet that slowly releases steroid into the eye for a prolonged period of time, and may reduce the need for other treatments for several years.

Laser photocoagulation was a mainstay of DME treatment before injections were shown to be safe and effective, but laser is used less often today. Focal laser reduces the risk of worsening of diabetic macular edema in select cases, but is less effective at decreasing edema that is already present. Focal laser is sometimes used in conjunction with injections. Peripheral laser is sometimes used to treat regions of the retina with poor blood flow, with the goal of reducing the stimulus for DME.

Vitrectomy surgery is considered for the treatment of diabetic macular edema in select cases that are unresponsive to other treatments. During surgery, which takes place in an operating room, the vitreous gel is removed from the eye and a thin layer called the internal limiting membrane (ILM) is peeled off the surface of the retina.



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Bay Area Retina Associates is a group practice of retinal surgeons. All members of the group are board certified by the American Board of Ophthalmology and have completed fellowship training in the medical and surgical care of retinal diseases. All BARA surgeons have expertise in the treatment of common diseases such as AMD, diabetic retinopathy and retinal detachment, as well as rare diseases. BARA physicians see patients in eight offices around the East Bay, a community we have served for almost 40 years.