

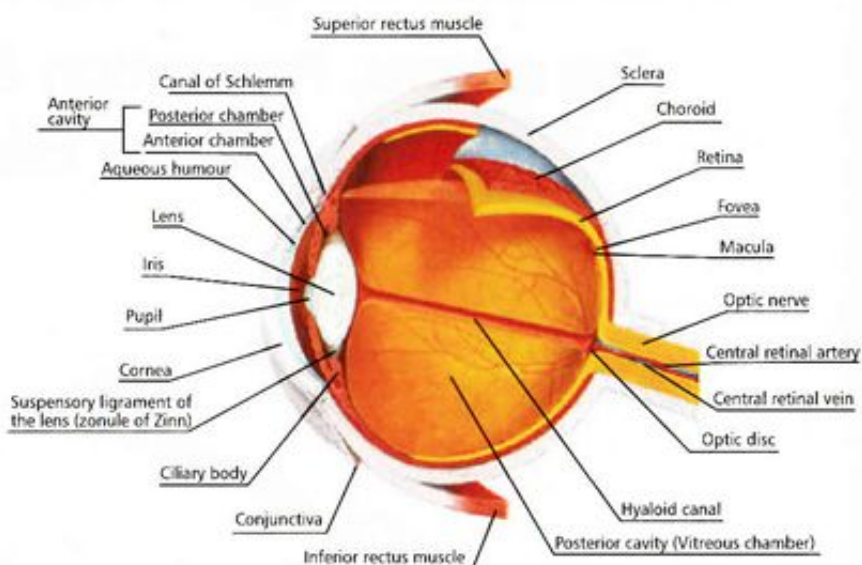
Human Eye

The human eye has been called the most complex organ in our body. It's amazing that something so small can have so many working parts. But when you consider how difficult the task of providing vision really is, perhaps it's no wonder after all.

Light enters through the cornea, passes through the opening in the iris, called the pupil, and then to the lens, which focuses light on the retina-the inner lining of the back of the eye.

Retina

The retina is lined with light-sensitive cells, or photoreceptors, called rods and cones. The macula is the center of the retina, and it is responsible for sharp central vision. The fovea is a small depression in the macula that provides the sharpest vision of all. When light reaches the retina, the photoreceptors send impulses along the optic nerve to the brain, which interprets them as vision.



What is Diabetes?

Diabetes is a disease that interferes with the body's ability to use and store sugar, which can cause many health problems. Too much sugar in the blood can cause damage throughout the body, including the eyes. Over time, diabetes affects the circulatory system of the retina.

What is Diabetic Retinopathy?

Diabetic retinopathy is a condition occurring in persons with diabetes, which causes progressive damage to the retina, the light sensitive lining at the back of the eye. It is a serious sight-threatening complication of diabetes.



Diabetic retinopathy is the result of damage to the tiny blood vessels that nourish the retina. They leak blood and other fluids that cause swelling of retinal tissue and clouding of vision. The condition usually affects both eyes. The longer a person has diabetes, the more likely they will develop diabetic retinopathy. If left untreated, diabetic retinopathy can cause blindness.

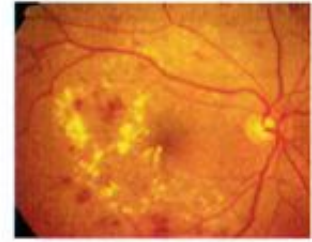
Symptoms of diabetic retinopathy include:

- Seeing spots or floaters in your field of vision
- Blurred vision
- Having a dark or empty spot in the center of vision
- Difficulty seeing well at night

What is Diabetic Macular Edema (DME)

When these damaged blood vessels leak and deposit fluid over or under the macula it results in swelling and vision impairment and is called Diabetic Macular Edema (DME).

Diabetic eye disease (retinopathy) can damage the small blood vessels of the eye. Fluid leaking from these blood vessels may cause the central part of the retina (the macula) to swell. This is called diabetic macular edema (DME). Macular edema is the most common cause of vision loss in people who have diabetes.



DME Symptoms

Common symptoms of DME are blurry vision, floaters, double vision, and eventually blindness if it goes untreated.



Types of DME

There are two Sub-types of DME

- **Focal DME** - abnormalities in the blood vessels in the eye lead to Focal DME. It is generally observed to be milder of the two subtypes with less macular thickening, better visual acuity, and lesser degree of retinopathy severity.
- **Diffuse DME** - It's more severe with greater degree of retinopathy severity and leads to more macular swelling and vision blur than Focal DME.

Who is at Major Risk of DME?

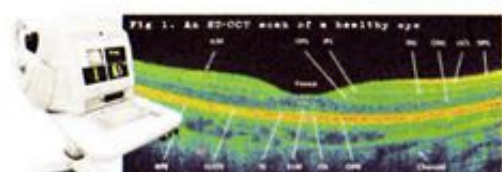
Those who have had diabetes for an extended amount of time,

- Severe hypertension (high blood pressure),
- Fluid retention,
- Hypoalbuminemia (low levels of protein in body fluids),
- Hyperlipidemia (high levels of fats in the blood).

How to Manage DME

Diagnosis:

Optical Coherence Tomography (OCT) - It is a diagnostic technique that renders an in vivo cross sectional view of the retina. OCT is useful in the diagnosis of many retinal conditions, especially when the media is clear.



Fundus fluorescein angiography (FFA) - It is a common procedure that is performed to give more information about the condition of the back of the eye. A small amount of yellow fluorescein dye will be injected into a vein in arm. The dye travels to eye where it highlights the blood vessels.



Treatment:

- **AntiVGEF**

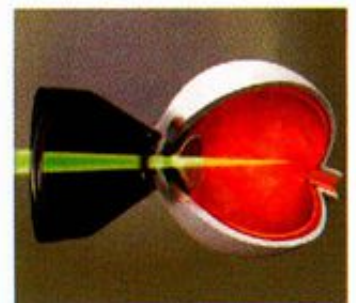
Anti-VEGF may represent an important role in DME. The properties of VEGF, and the consequences of its inhibition, also suggest a role for this approach in the management of DME. Blockade of all involved growth factors will likely be necessary to completely suppress the harmful effects of ischemia, but even isolated blockade of VEGF may have beneficial effects on DME.

VEGF increases vascular permeability by relaxing endothelial cell junctions, which increases permeability and leakage. Anti-VEGF blocks this effect to some extent, as demonstrated in several recent clinical trials and case series involving the anti-VEGF molecules pegaptanib, ranibizumab, and bevacizumab. First came Pegaptanib sodium and later the off-label use of Bevacizumab followed by Ranibizumab that not only slowed vision loss or maintained current visual acuity, but also offered the potential to improve and even restore functional vision. Currently only Bevacizumab & Ranibizumab are available for use.



- **Laser photocoagulation**

It is the current standard treatment for DME. If applied timely, laser photocoagulation can at best maintain the current visual acuity and thus reduce the risk of vision loss, but rarely improve vision.



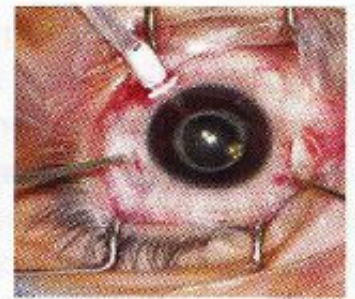
- **Steroids**

Steroids are more frequently necessary for medical therapy in treatment of diffuse DME. Corticosteroids, such as triamcinolone acetonide, are often used as intravitreal injections or intravitreal implants for the treatment of DME. The corticosteroids suppress inflammation and reduce leakage of fluid from blood vessels.



- **Vitreotomy**

If a significant amount of blood is found in the center of the eye (vitreous gel), a vitrectomy may be performed.



- **Combination Approach**

Combinations of anti-VEGF compounds with the laser treatment may offer a higher chance of improving vision-related function and quality of life. It also reduces the risk of ocular adverse effects, such as endophthalmitis due to eye injection and harmful eye inflammation.

ROUTINE CARE

Sometimes, there is nothing you can do to prevent diabetic retinopathy or DME, but your best chance at avoiding them comes by maintaining a healthy lifestyle:

- Keep your blood sugar and cholesterol under control
- Exercise regularly
- Eating lots of vegetables and fruits
- Avoid smoking, drinking if you are diabetic as it can also affect your vision
- Visit your eye doctor at least once a year to stay on top of your eye health

