

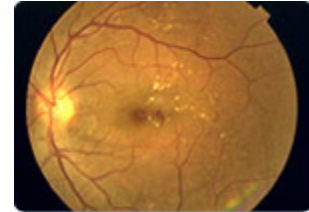
## Diabetic Retinopathy

### Diabetic Eye Complication: The Leading Cause of Acquired Blindness in Adults

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A recent national health survey estimated that 9% of our population, or about 1.9 million Malaysians, suffers from this malady. Generally, diabetes mellitus (DM) can be divided into two main types.



Diabetic Retinopathy

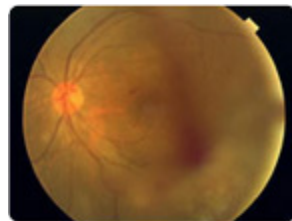
Type 1 DM refers to the disease in which the age of onset is 30 years or younger, whereas Type 2 DM refers to adult onset disease, usually above the age of 30 years. By far, the most common type of DM is the Type 2 DM, accounting for more than 95% of all diabetic patients.

Of the many body system that can be affected by uncontrolled diabetes, the eye is an important organ that often takes the brunt of the disease, and literally, with 'visible' effect.

Essentially, the structure and the function of the blood vessels in the diabetic person are altered, making the blood vessel walls prone to hardening, narrowing, leaky and eventually, poor blood flow. Such changes when occur in the eye, usually affects the light-sensing layer at the rear of the eye.

This layer, the retina, is analogous to the film in the camera. For the eye to see well, the retina must be of good health.

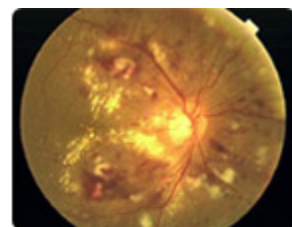
However, in the early stages of the abnormal changes in the retina, or non-proliferative diabetic retinopathy (NPDR), the patient may not notice any symptoms.



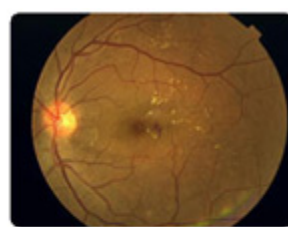
Normal Retina in the left eye of a 50 year old patient.



A left eye with Moderate Non-proliferative Diabetic Retinopathy (NPDR)



A right retina afflicted with Severe Non-Proliferative Diabetic Retinopathy and Macular Edema



An eye with macular edema

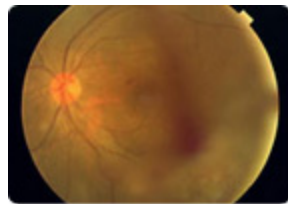
With progression of retinopathy, the patient will experience blurriness in vision. This blurriness is usually caused by fluid and fats leakage from abnormal blood vessels in the retina layer, making the nerve layer swollen (macular edema).

With deterioration in retinopathy, the altered blood vessels may soon be blocked, and the retina will be starved of oxygen and nutrients that is normally delivered with the bloodflow.

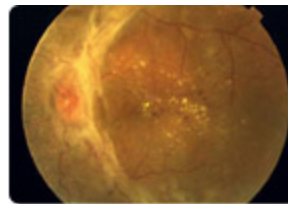
The vision may decrease further and abnormal growth of 'new' vessels on the retina will ensue as a result of an attempted compensatory mechanism by the eye in response to the oxygen-starvation state. This state is termed Proliferative Diabetic Retinopathy (PDR).

These 'new' vessels bring about devastating results as they are highly fragile and often grow hand-in-hand with abnormal scar tissues on the retina surface.

The fragile, abnormal 'new' vessels can cause massive sudden bleeding inside the eye, obscuring vision. In addition, the scar tissues on the retina surface often contracts, the effect of which crumple and distort the retina layer.



Abnormal new vessels on the optic nerve and bleeding into the vitreous gel



PDR with scar on surface of retina

Moreover, the pull by these contracting scars on the retina detaches the retina from its place lining the rear part of the eye, leading to further permanent damage to the eye and vision.

Unfortunately, diabetic retinopathy is present in about 70% of all DM patients after 10 years of diabetes, and almost all patients will suffer from retinopathy after 20 years of disease. This results in diabetes being the leading cause of acquired blindness in the adult population.

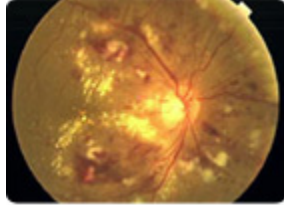
A diabetic patient is 25 times more likely to suffer from vision impairment as compared to a non-diabetic person.

### Treatment

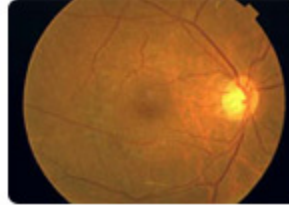
There had been highly effective treatment for retinopathy, primarily the use of laser, for some 20 years now. Prior to the introduction of laser in treatment of diabetes retinopathy, about 10% of patients with severe retinopathy will go blind with each passing year.

With appropriate and timely laser treatment, the risk of blindness is reduced by more than 95%.

The aim of the laser treatment is the prevention of deterioration in retinopathy. Appropriate laser treatment works by preventing the growth of abnormal 'new' vessels and the scar tissues, and minimises their attendant catastrophic visual effects in the diabetic eye.



An eye with severe non proliferative diabetic retinopathy and macular edema, affecting vision. This patient also has high blood pressure.



The same patient 1 year after laser treatment and had better control of his diabetes and blood pressure.

The patient must realise that laser treatment in diabetes is not meant to improve, but to maintain vision.

Timely laser treatment refers to intervention at the less severe retinopathy stages, which is often without symptoms. Therefore, it is important for the diabetic patient to undergo an eye check-up at least once a year by a qualified eye doctor (ophthalmologist).

### Eye Screening

The patient should have his eyes examined even if the diabetes was newly diagnosed and/or the patient may not have any vision symptoms yet, for diabetic retinopathy may already have been present in the patient.

In fact, many Type 2 DM patients (adult onset diabetics), may have diabetes for many years before the condition is diagnosed, therefore retinopathy could have set in by the time the patient is diagnosed diabetic.

### Role of surgery

In more severe cases, where abnormal blood vessels and scar tissues had resulted in serious retinal damage, laser treatment alone is no longer effective in restoring sight.

The patient will require retinal surgery to remove the abnormal vessels, blood, and scar tissues on the retina in order to salvage vision and the eye. Although such sophisticated surgery is technically challenging, it is currently available and offered by our highly trained retinal surgeons in our centre.

Our retinal specialists is an important patient's advocate in deciding when surgery is necessary and will advise the patient at risk to consider surgical intervention before the situation becomes non-amenable to surgical treatment.

### Prevention

Apart from being enrolled in a life-long eye check-up programme, it is important for the patient to be aware of the control of blood sugar on the development of diabetic complications.

It has been shown beyond doubt, both in Type 1 and Type 2 DM, that strict control of blood sugar level (with regular monitoring of the blood sugar level) prevented and retarded the progression of diabetic complications, including that of the eye, heart and kidney damages.

Moreover, if the patient has co-existing high blood pressure, studies had also proven that strict control of the blood pressure was beneficial in reducing the severity and in retarding the progression of diabetic complications.

In short, it is just as important for the patient as well as their primary caregiver to be aware of the factors affecting, and the natural course of, the diabetic eye complications.

The timely enrolment of the diabetic in a lifelong eye-screening programme with appropriate interventions involving laser treatment and retinal surgery is imperative.

This greater awareness and the presence of a coordinated team effort involving the patient, caregivers, diabetologist, ophthalmologist and the retinal surgeon is paramount in reducing the burden of blindness from diabetes.

**Related Links:**

<http://www.nei.nih.gov/health/diabetic/retinopathy.htm>

<http://www.eyesondiabetes.org.au/>

<http://public.mib.org.uk/xpedio>

<http://www.joslin.org>