

# Main phases of diabetic retinopathy

[Health & Medicine](#), [Diabetes](#)



Diabetic Retinopathy (DR) is an abnormality related with eye. It is caused due to alteration of the blood vessels present in the retina. If this disease is not treated at the early time, it may lead to permanent vision loss.

Numerous image processing techniques including Enhancement, Segmentation, Morphology, Image Fusion, Classification and Registration has been enveloped for the early recognition of DR through features such as blood vessels, exudes, hemorrhages and microaneurysms. This paper deals with a new approach for the analysis of proliferate and non-proliferate DR with the help of Compressive Sensing (CS) technique. Compressive Sensing is a sparse way of effective reconstruction of signals that works mainly on two constraints namely sparsity and incoherence.

Diabetes is the chief reason of recent cases of blindness among adults. DR is one of the serious illnesses caused by diabetes. DR ultimately results in blindness if left untreated. In its early phases, DR is usually local; it doesn't affect the whole retina, and therefore it causes gradual vision impairments. Consequently, the risk of visual disabilities and blindness due to DR could be greatly minimized by early diagnosis and effective treatments that inhibit the succession of the disease. However, patients suffering from DR usually do not notice any visual imperfections until the disease has affected a large area on the retina. The need for mass-screening of diabetic patient's eyes is clearly a vital concern.

Primarily, DR has two main phases, Non-Proliferative and Proliferative DR. Furthermore, DR can be divided into four phases:

- A) Mild Non-Proliferative Retinopathy – This is the beginning phase of the illness and the occurrence of microaneurysms happens at this phase. The indications at this phase are minute areas of swelling in the retinas small blood vessels. About 40 percent of people affected by diabetes have this mild signs of Non-Proliferative Retinopathy.
- B) Moderate Non-Proliferative Retinopathy – This phase occurs when DR is left untreated. The disease develops and a few blood vessels that nurture the retina are blocked. A small amount of venous bleeding can also be noticed. In general 16 percent of patient at this phase will develop Proliferative Retinopathy within a year.
- C) Severe Non-Proliferative Retinopathy – At this phase a huge number of blood vessels are blocked. It stops the blood supply in various parts of the retina and thereby informs the body to develop new blood vessels and hence creating unwanted blood vessels.
- D) Proliferative Retinopathy-This is the highly developed phase and at this phase, the signals send by the retina for nourishment induces the development of new abnormal and delicate blood vessels. These unusual blood vessels grow up beside the retina and beside the surface of the vitreous gel that are packed in the inner layer of the eye. These delicate blood vessels does not cause indications or vision loss. As they are very delicate, if they leak blood then rigorous vision loss occurs that may even lead to blindness. Recent research says about 3 percent of people at this phase may suffer rigorous vision loss.

220