

## Nonproliferative Diabetic Retinopathy

Nonproliferative diabetic retinopathy (NPDR) occurs due to increased capillary permeability, progresses silently, and is generally asymptomatic. Hence, screening tests are performed periodically for prevention. On fundoscopic evaluation, retinal microaneurysms, flame-shaped hemorrhages, cotton wool spots, hard exudates, and macular edema can be seen. Treating diabetes slows down disease progression. Treatment options include laser photocoagulation and VEGF inhibitors such as bevacizumab.



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### Characteristics

#### Increased Capillary Permeability and Leakage

##### [Up-arrow Caterpillar Leaking](#)

Accumulation of glycated proteins causes the endothelial permeability to increase, which leads to exudation of plasma and proteins.

#### Often Asymptomatic

##### [Thumbs-up](#)

NPDR progresses slowly over a decade and is mostly asymptomatic.

### Fundoscopy Findings

#### Retinal Microaneurysms

##### [Red-tin Microscope-aneurysm](#)

Retinal microaneurysms are outpouchings at the retinal capillary wall which occur at the inner nuclear layer. Intraretinal microvascular anomalies (IRMA), are sinusoidal dilations in the blood vessels of the retina.

#### Flame-shaped Hemorrhages

##### [Flame Shaped Hemorrhage-Hammer](#)

Flame-shaped hemorrhages are due to rupture of aneurysms at the outer plexiform layer. These can be visualized on funduscopy as small, red, flame-shaped spots on the retina.

#### Cotton Wool Spots

##### [Cotton Wool-Sheep with Spots](#)

Cotton wool spots are white spots in the superficial retina caused by axoplasmic stasis in the retinal nerve fiber layer.

#### Hard Exudates

##### [Yogurt](#)

Lipo-proteinaceous deposits present in the outer plexiform layer are called hard exudates. They are a common feature of NPDR.

## Macular Edema

[Macula-Dracula with Edamame](#)

Macular edema occurs when fluid and protein deposits collect on or under the macula of the eye and cause it to thicken and swell. This is an ominous finding.

## Management

### Treat Diabetes

[Dyed-bead-pancreas with Treat-pill](#)

Patients with HbA1c level greater than 7.5% are at a higher risk for microvascular complications. Glycemic control can prevent disease progression.

### Laser Photocoagulation

[Laser with Photo-Clogs](#)

Laser photocoagulation is a procedure that uses a high-powered, pulse laser to reduce retinal angiogenesis.

### Bevacizumab

[Beaver-scissor-mob](#)

Bevacizumab is a monoclonal antibody against vascular endothelial growth factor (VEGF) and is given as an intravitreal injection.