General
- Diabetes → **Microangiopathy**
- Affects: **Nerves, Kidneys, Retina**
- Causes **variable visual loss**

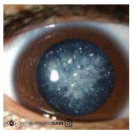
Extraocular Muscles & Nerves
- **Diabetic cranial neuropathy**
- Commonly: **3rd & 4th & 6th nerves**
- Presentation: **Diplopia**

Cornea
- **Corneal abrasion**
- Symptom: **Eye pain**
- Delayed healing

Iris
- **Iris ischemia**
- Leads to **Rubeosis iridis (iris neovascularization)**

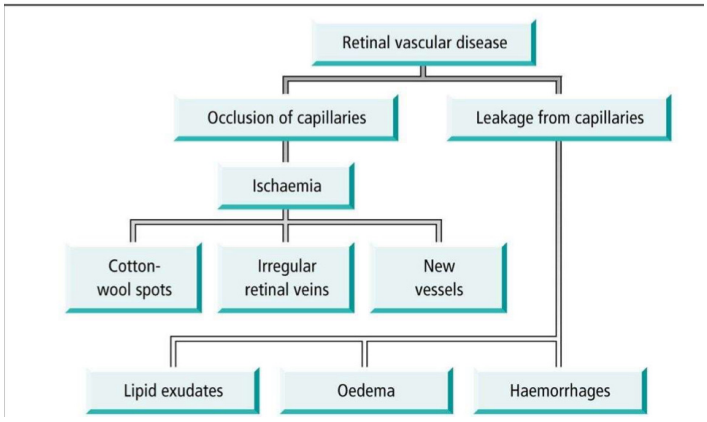
Neovascular Glaucoma
- New vessels grow over **trabecular meshwork**
- Cause **angle closure**
- Result: ↑ **Intraocular pressure (IOP)**

Lens
- **Cataract**
- **Snowflake cataract** → young, poorly controlled DM
- **Most common**: **Senile cataract**



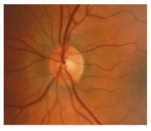
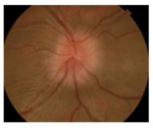
Diabetic Retinopathy (Most Important)
- **Most common & most serious complication**
- Due to **chronic hyperglycemia**
- Age group: **25–74 years**
- **Leading cause of blindness** in diabetics

Causes of Vision Loss
- **Diabetic macular edema (most common)**
- Macular ischemia
- Vitreous hemorrhage
- Retinal hemorrhage
- Tractional retinal detachment
- Neovascular glaucoma



Retina Anatomy
- Layers:
- **Neurosensory retina (inner)** (NSR)
- **Retinal pigment epithelium –(RPE)(outer)**
- **Subretinal space** → site of retinal detachment
- Blood supply:
- Inner retina → **Central retinal artery** $\frac{1}{3}$ inner part
- Outer retina → **~~Choriocapillaris~~** choroidal circulation outer part $\frac{2}{3}$

Rubeosis Iridis
- Iris neovascularization
- Can cause **neovascular hemorrhage & glaucoma**

A. 
B. 
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Answer :
A. Optic disc pallor B. Optic disc edema C. Optic disc cupping

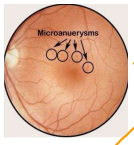
With **chronic hyperglycemia**:
- Retinal capillaries are damaged
- **Loss of pericytes** occurs
- Capillary walls become weak

This leads to **diabetic microangiopathy**

NPDR – Non-Proliferative Diabetic Retinopathy

(Early stage)

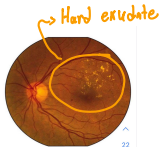
What happens in NPDR?



- Blood vessels are damaged but **no new vessels form**
- Changes include:
- **Microaneurysms** (earliest sign)
- **Dot and blot retinal hemorrhages**
- **Hard exudates** due to lipid leakage
- **Retinal edema**
- **Cotton wool spots** (areas of retinal ischemia)

- Flame-shaped hemorrhages

Intraretinal microvascular abnormalities (IRMAs)



Effect on vision
- Often **asymptomatic**
- Vision becomes blurred if **diabetic macular edema** is present

Key point:

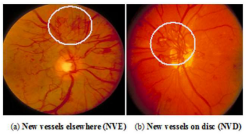
NPDR = vascular leakage and ischemia **without neovascularization**

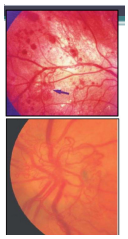
Progression: Retinal Ischemia
- Ongoing capillary closure causes **retinal hypoxia**
- The retina releases **VEGF**

PDR – Proliferative Diabetic Retinopathy

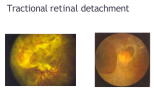
(Advanced and sight-threatening stage)

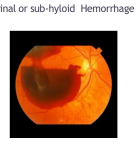
What happens in PDR?
- **Abnormal new blood vessels** develop (neovascularization)
- Locations:
- **Neovascularization of the disc (NVD)**
- **Neovascularization elsewhere (NVE)**





Why is it dangerous?
- New vessels are **fragile**
- They lead to:
- **Vitreous hemorrhage**
- **Fibrovascular tissue formation**
- **Tractional retinal detachment**
- **Neovascular glaucoma**





Effect on vision
- **Sudden and severe vision loss**
- Patients may report floaters or a dark curtain

Key point:

PDR = neovascularization → bleeding and traction

1. **Diabetic retinopathy** results from chronic hyperglycemia causing **retinal microangiopathy**.

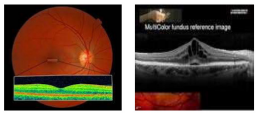
2. **NPDR** is characterized by **microaneurysms, hemorrhages, exudates, and macular edema without neovascularization**.
3. Progressive retinal ischemia leads to increased **VEGF** production.
4. **PDR** is defined by **retinal neovascularization** (NVD or NVE).
5. **PDR complications** include **vitreous hemorrhage, tractional retinal detachment, and neovascular glaucoma**, causing severe vision loss.

Feature	NPDR	PDR
New blood vessels	No	Yes
Main pathology	Leakage & ischemia	Neovascularization
Vision loss	Gradual or mild	Sudden & severe
Major complications	Macular edema	VH, TRD, NVG

Investgations

HbA1c, blood sugar

OCT, to determine the thickness, presence of swelling, to diagnose macular edema or CSME



Fluoroscein angiography