Diabetes Related Eye Issues

• Diabetic Retinopathy
  – Painless

• Cataract
  – Clouding of Lens

• Glaucoma
  – optic nerve damage due to the intraocular pressure
Focus on Diabetic Retinopathy

Normal Retina
No Diabetic Retinopathy

Advanced Diabetic Retinopathy
with Severe Retinal Detachment
Untreatable Blindness

PREVENTION IS KEY !!!
US Prevalence of Diabetic Retinopathy

Leading Cause of Blindness in the US for Ages 20-74 years

Rajeev S. Ramchandran - FEI, UR Medicine

The map above reflects estimated state-by-state prevalence rates of diabetic retinopathy. The overall national rate is 5.4% for the U.S. population age 40 and older, indicating that nearly 7.7 million older Americans have diabetic retinopathy. Hover over the map and click on the desired state for the diabetic retinopathy prevalence rate in that state.
Cases of DR have Doubled

Cases of Diabetic Retinopathy
(in thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>4,063</td>
</tr>
<tr>
<td>2010</td>
<td>7,685</td>
</tr>
</tbody>
</table>
Male = Female
Hispanic Populations at Risk

2010 U.S. Prevalence Rates
Diabetic Retinopathy

- White
- Black
- Hispanic
- Other

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High Sugar, Blood Pressure, & LDL Destabilizes Small Blood Vessels

**High Sugar, BP, LDL**

**Disruption of Blood Vessels = Leakage**, Bleeding

**Leads to macular edema**

Formation of abnormal new blood vessels that are brittle, leak and bleed and can pull on the retinal leading to a retinal detachment and vision loss.

Release of Vascular Endothelial Growth Factor

Compromise ability to delivery oxygen to retina = Hypoxia
Diabetic Retinopathy Causes Blindness

1. **Macular Edema** – swelling of the retina from leakage of central blood vessels

2. **Proliferative Retinopathy** – abnormal new blood vessels develop due to poor blood flow and cause bleeding and retinal detachment
Macular Edema
Swelling of Retina due to leaking blood vessels
(Exudates = Leaking of Lipoproteins, Cholesterol)

Fovea – sharpest area of vision
Responsible for most of vision loss in Diabetic Retinopathy
~33% 3 year risk of vision loss without treatment
Proliferative: New Abnormal Blood Vessels

Bleeding

Abnormal New Blood Vessels

Abnormal Tissue Pulling on Retina

Permanent Blindness in 44% in 4 yrs with no treatment
Laser Treatment

Focal Laser Macular Edema

Panretinal Laser - PDR

50% reduction in vision loss risk

Side Effects: Black spots, decreased color and night vision