Exam 02 Review Slides

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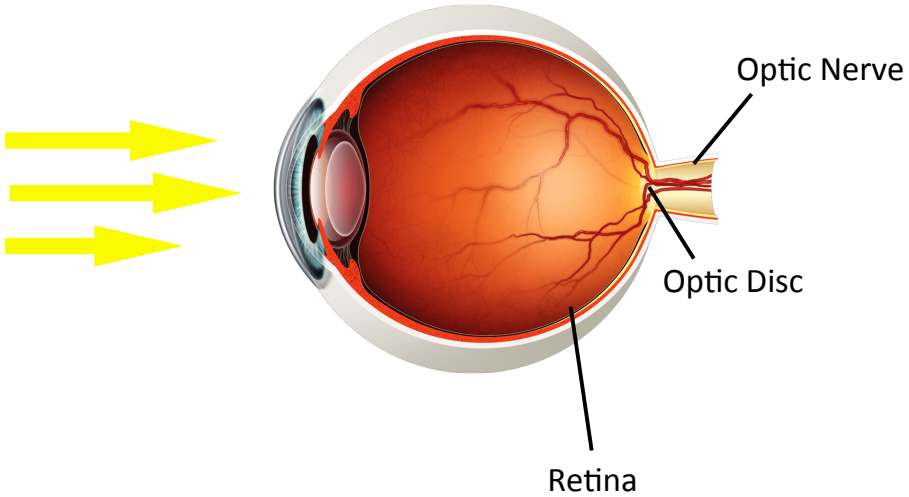
BIOSTAT 725, Duke University

April 15, 2025

Primary Open-Angle Glaucoma



- Glaucoma is the most common cause of irreversible vision loss worldwide
- Disease that damages the eyes optic nerve
- Fluid builds in the eye leading to increased pressure
- Increased pressure causes damage to the optic nerve, resulting in vision loss
- No symptoms until vision loss occurs!

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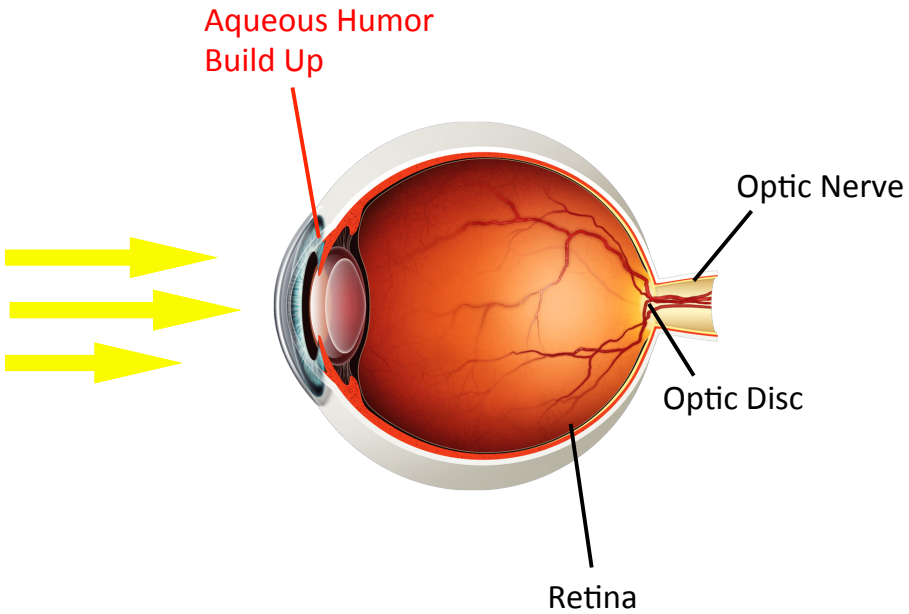

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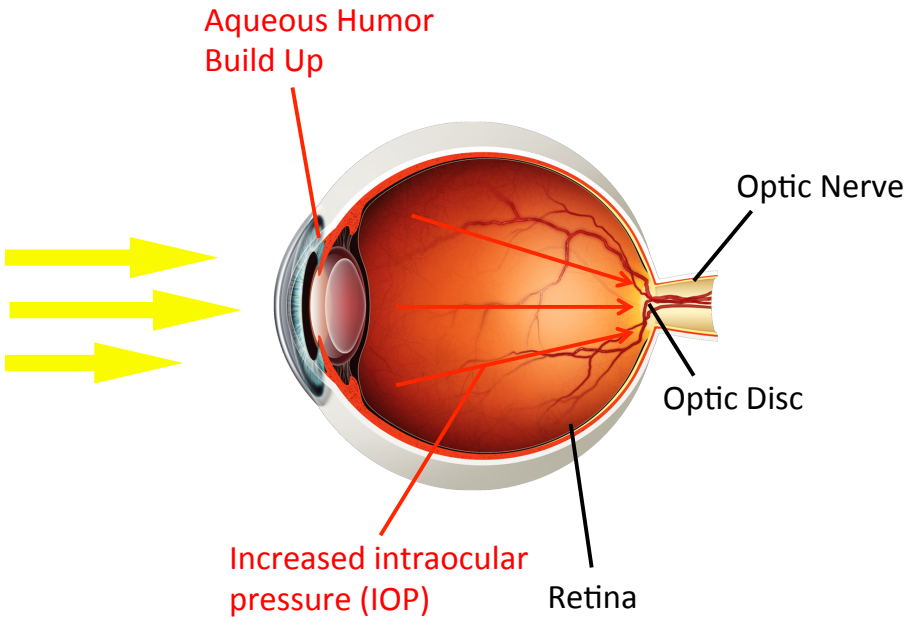

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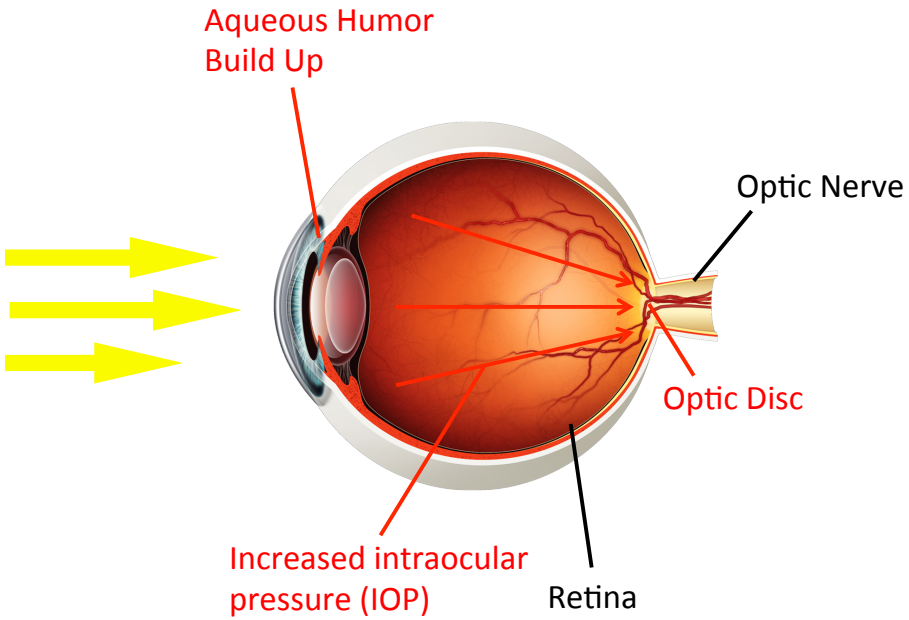

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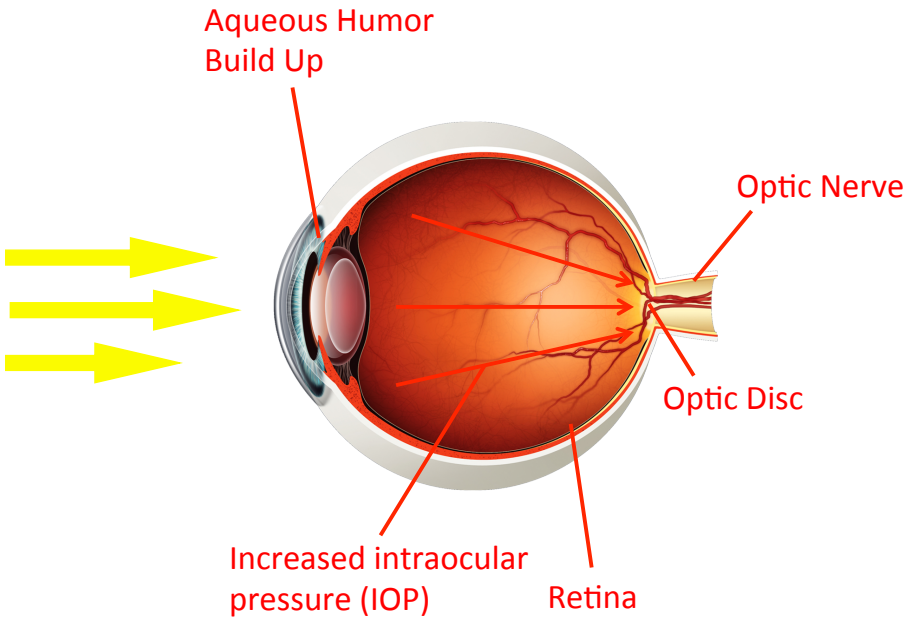

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Glaucoma Progression

- Once a patient is diagnosed, clinicians must balance the risks and expenses of advancing levels of medical and surgical intervention with the risks of further vision loss due to **disease progression**

- Determining if the disease is progressing remains one of the most difficult tasks in the clinical setting

Methods to Detect Progression

Structural changes of the optic nerve head or retinal nerve fiber layer (RNFL) or **functional** changes in the visual field (VF)

Demonstrating the Visual Field

Visual field

Demonstrating the Visual Field

Right

Left

Demonstrating the Visual Field

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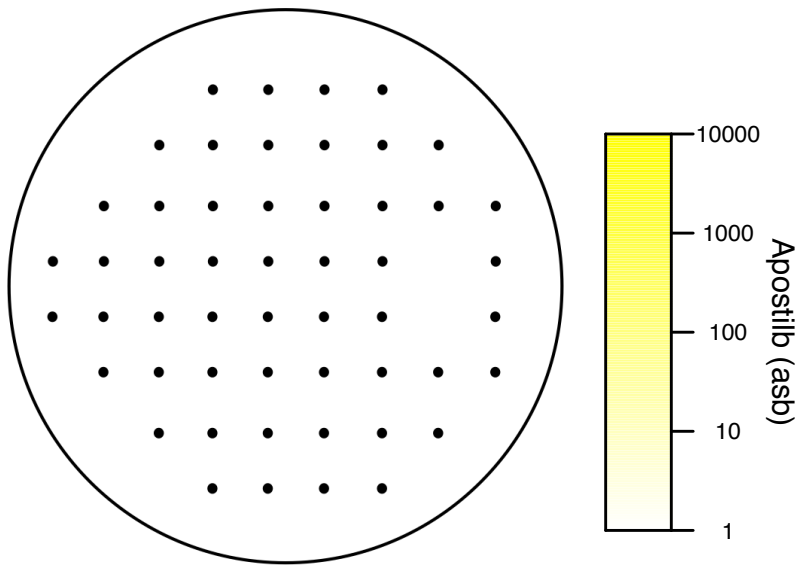
Generating Visual Field Data

- Standard automated perimetry: Humphrey Field Analyzer-II
- Estimating differential light sensitivity (DLS) across the VF
- Intensity: measured in Apostilbs
  - 1 $\approx$ Background (no constrast)
  - 10,000 = Bright (large contrast)



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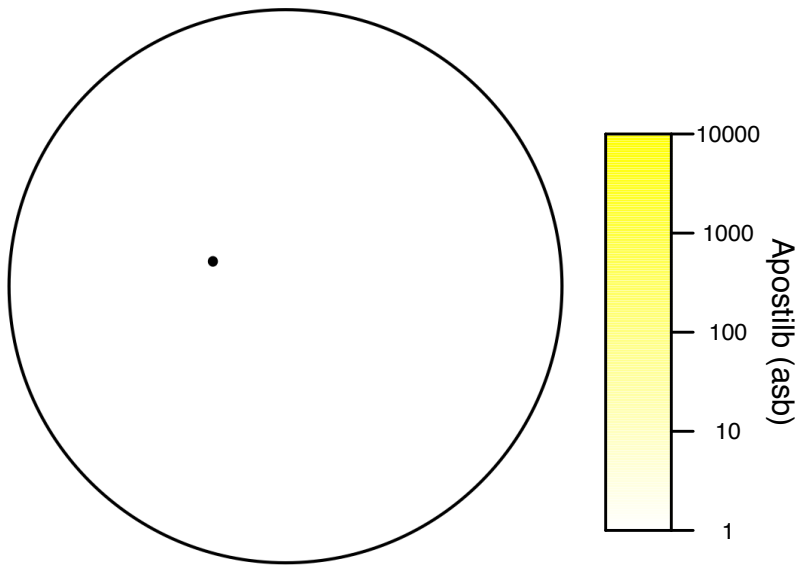

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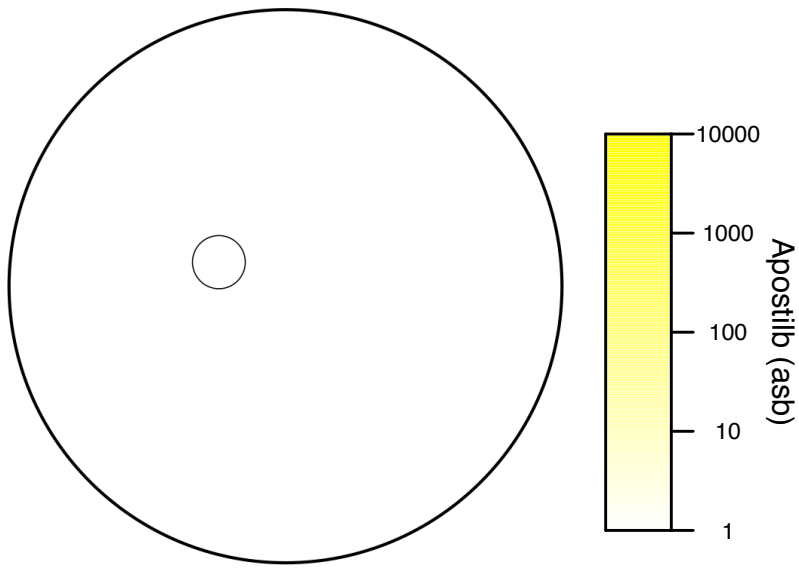

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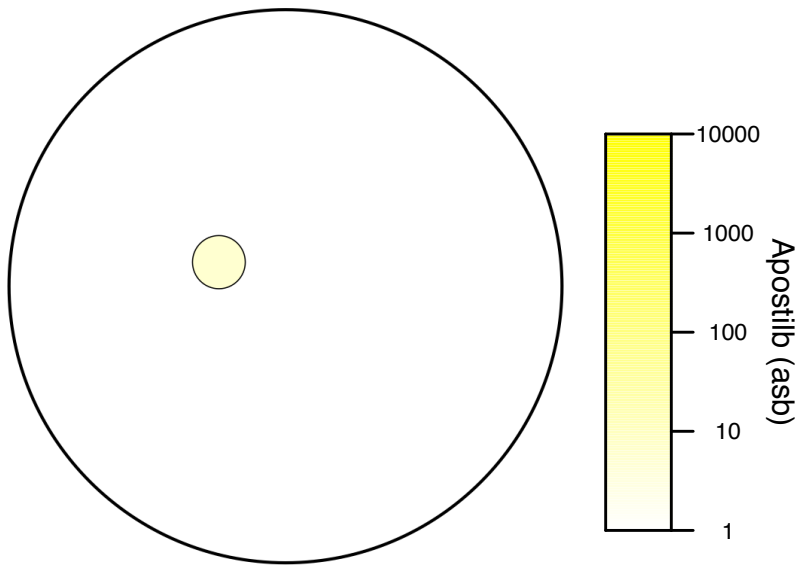

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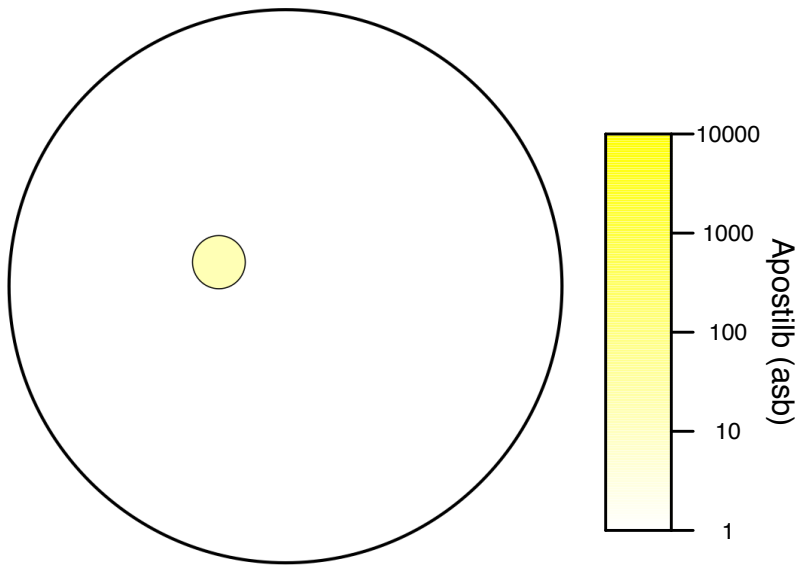

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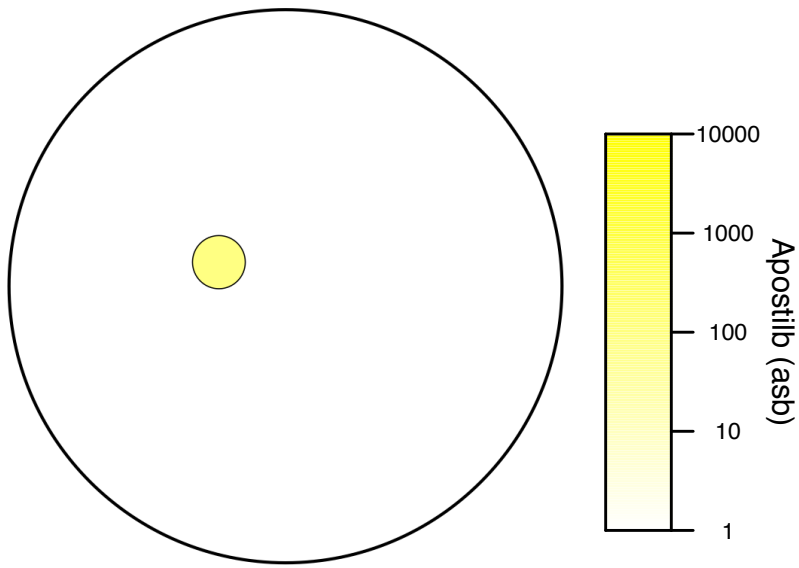

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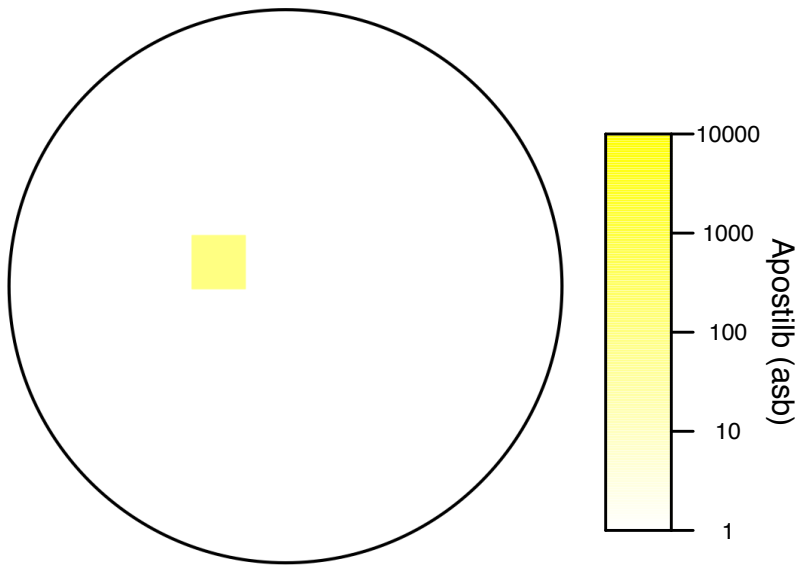

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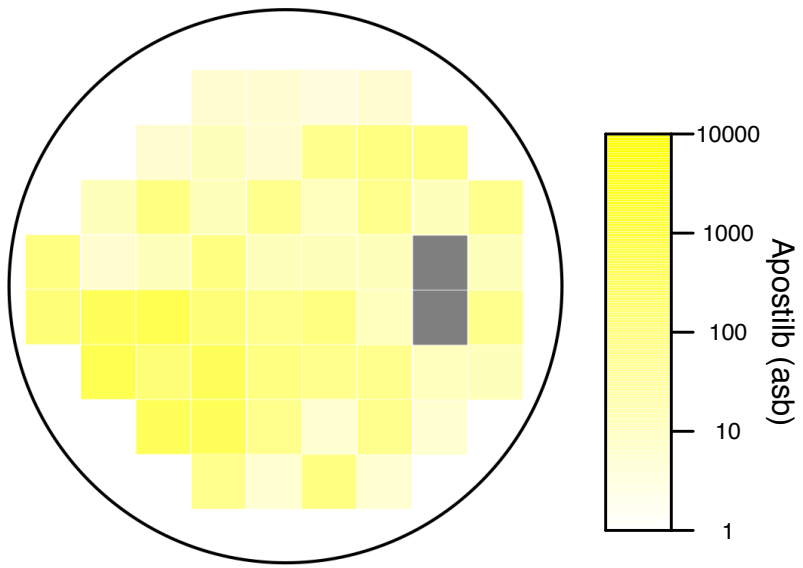

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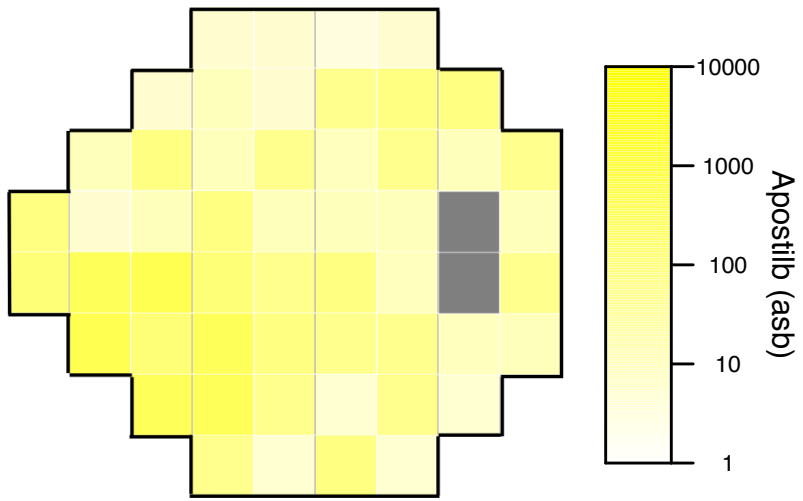

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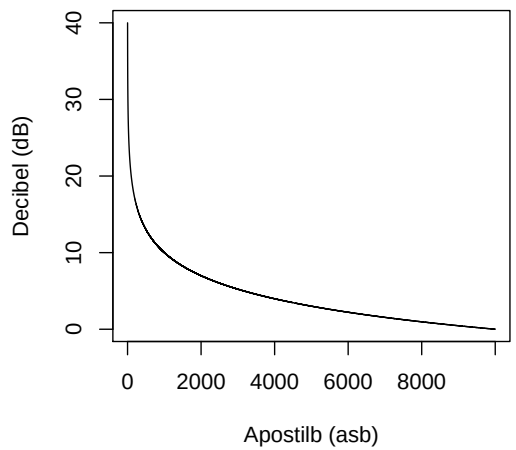

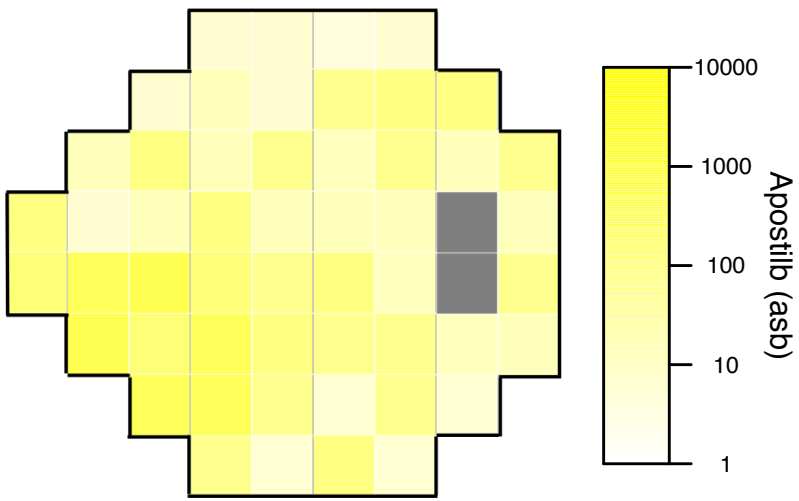

- Converting from Apostilbs to Decibels

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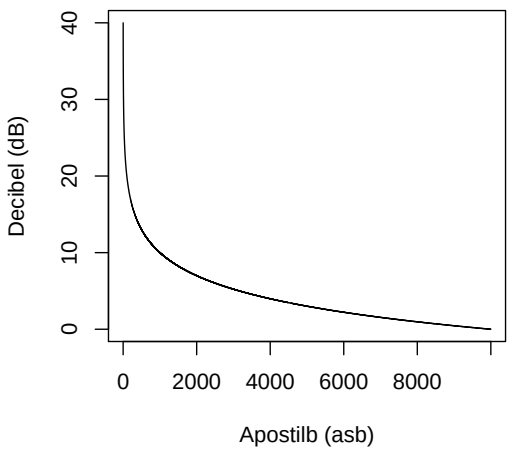

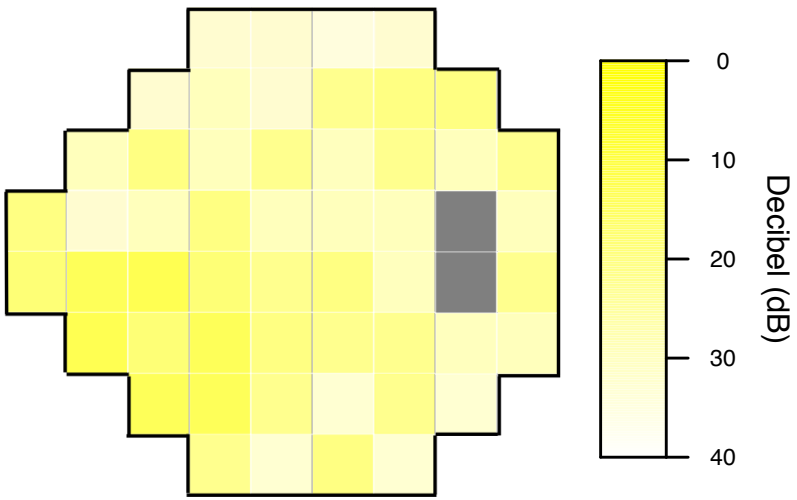

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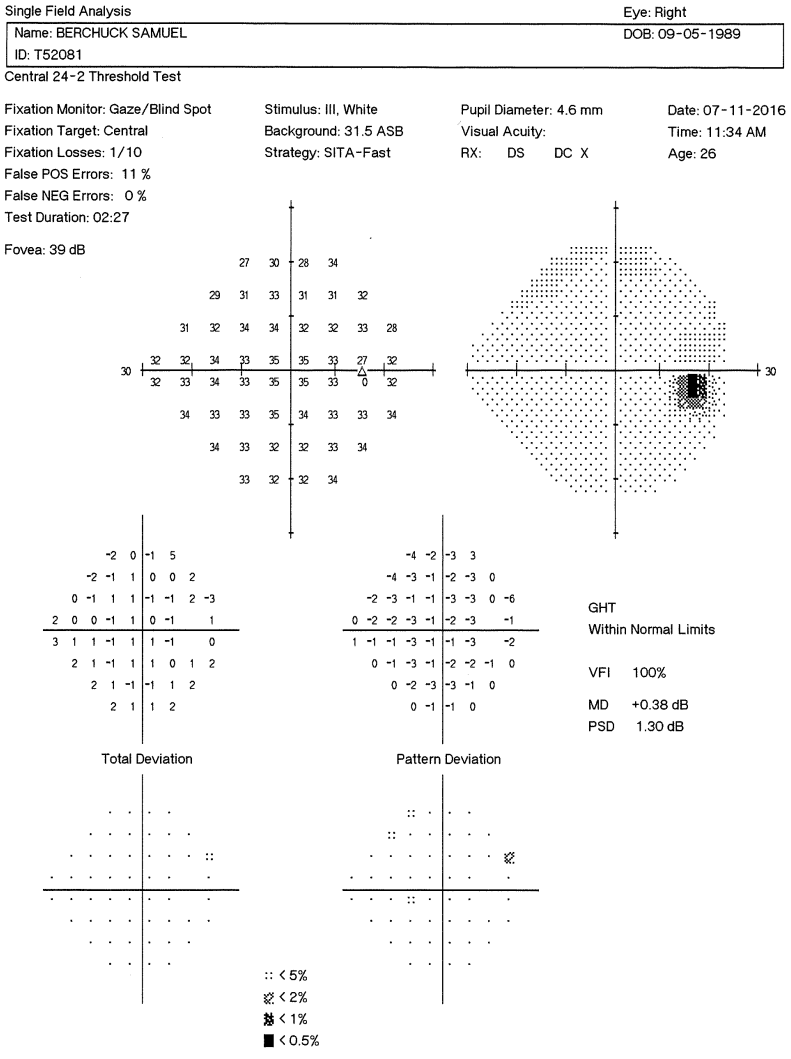

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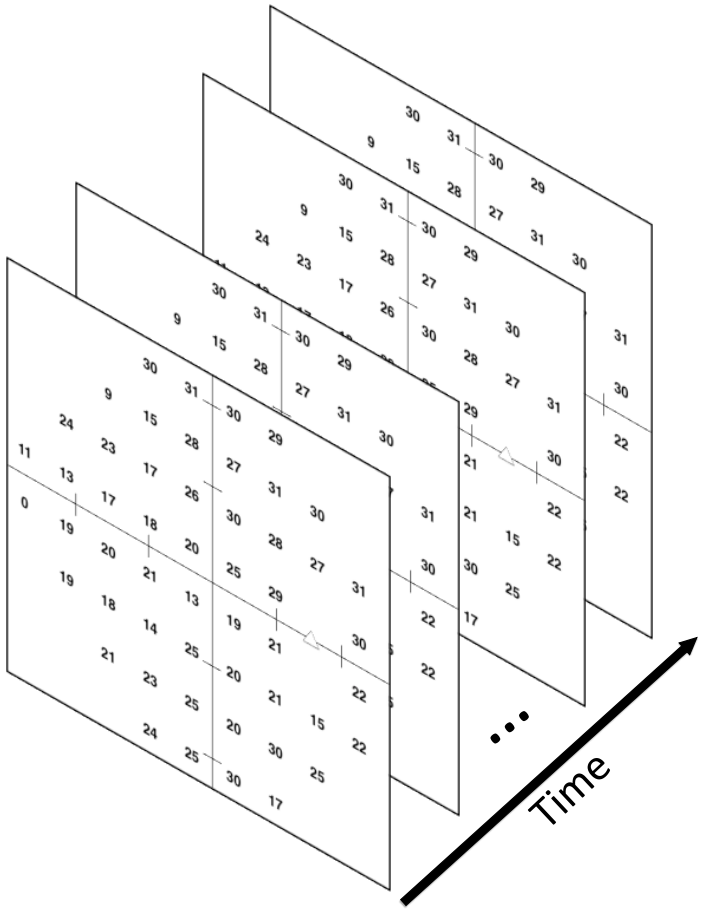

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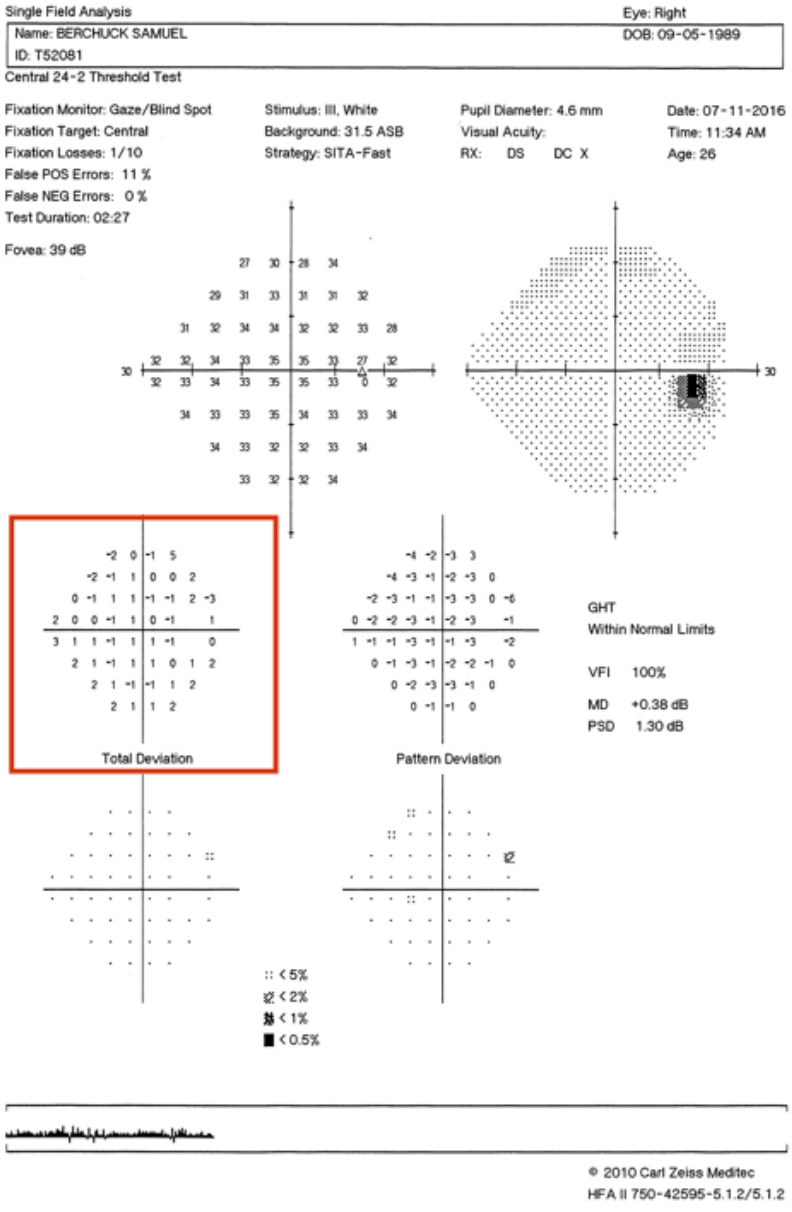

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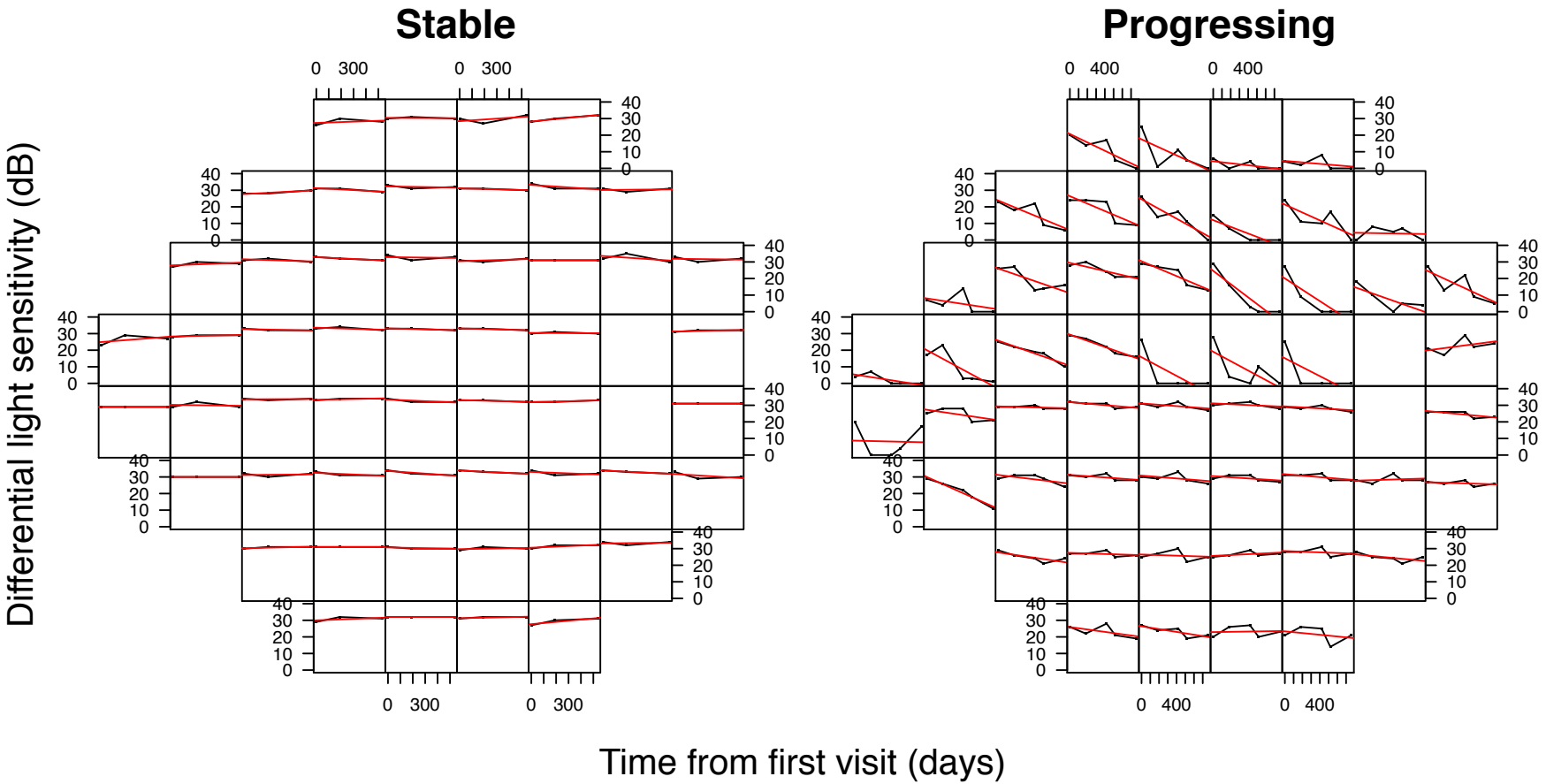
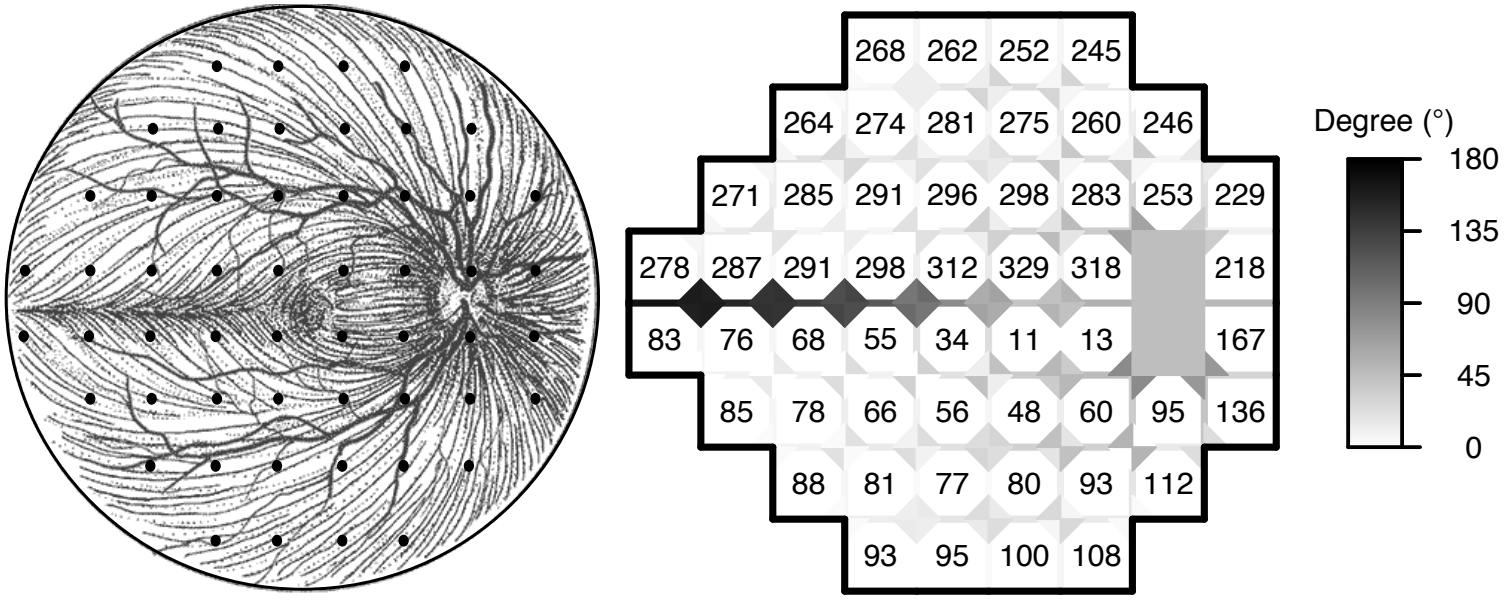


Visual Field and Retinal Nerve Fiber Layer



- **Recall:** Glaucoma damages the optic disc, so VF deterioration corresponds to underlying fibers that enter the damaged regions
- Visual Field/RNFL connection: angle that each test location's RNFL fibers enter the optic disc