Visual Field Interpretation
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Visual Fields and Glaucoma Management

- Glaucoma Diagnosis
  - Confirms Glaucoma Diagnosis
- Quantifies the Amount of Glaucoma Damage to Set Target Pressures
- Judge for Glaucoma Progression

Case SQ
- 63 yobm
- +HTN
- No complaints
- VA 20/20 OD and 20/20 OS
- PERRLA - APD
- CF FTFC OU
- SLE Unremarkable
- TA 24, 21, 26 OD and 20, 18, 23 OS
- CCT 586/588
- Gonio shows open angles OU
- DFE: See Photos

What Constitutes a Visual Field Defect?
- Glaucoma Hemifield Test
- Cluster Analysis
- Pattern Standard Deviation

Minimum Criteria for Diagnosing Glaucoma
- Two “Outside Normal Limits” Glaucoma Hemifield Tests Or
- A Cluster of Three or More Nonedge Points (30-2) in a Location Characteristic for Glaucoma, All of Which Are Depressed on the Pattern Deviation Plot a P < 5% Level and One of Which Is Depressed at a P < 1% Level on Two Consecutive Fields Or
- A Pattern Standard Deviation That Occurs in Less Than 5% of Normal Fields on Two Consecutive Fields

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**Visual Field Quantification (Mild, Moderate, Severe)**
- Mean Deviation (MD)
- Number of Abnormal Points on the Pattern Deviation Plots
- Decibel Value of the Four Points Just Off Fixation

**Mild Visual Field Defect**
- The Mean Deviation Index (MD) Is Better Than -5 dB
- On the Pattern Deviation Plot, Fewer Than 18 (14) of the Points Are Depressed Below the 5% Level and Fewer Than 10 (8) Points Are Depressed Below the 1% Level on 30-2 (24-2)
- No Point in the Central 5 Degrees Has a Sensitivity < 25 dB

**Moderate Visual Field Defect**
- The Mean Deviation Is Better Than -10 dB
- On the Pattern Deviation Plot, Fewer Than 36 (28) of the Points Are Depressed Below the 5% Level and Fewer Than 20 (16) Points Are Depressed Below the 1% Level on 30-2 (24-2)
- No Point in the Central 5 Degrees Has a Sensitivity < 15 dB

**Severe Visual Field Defect**
- The Mean Deviation Is Worse Than -10 dB
- On the Pattern Deviation Plot, More Than 36 (28) of the Points Are Depressed Below the 5% Level or More Than 20 (16) Points Are Depressed Below the 1% Level on 30-2 (24-2)
- Any Point in the Central 5 Degrees Has a Sensitivity < 15
- There Are Points Within the Central 5 Degrees With Sensitivity < 25 dB in Both Hemifields

**Guidelines For IOP Target Values**
- No Damage – OHTS recommended 20% Reduction Of Baseline IOP
- Mild Damage - 20-30% Reduction Of Baseline IOP
- Moderate Damage - 30-40% Reduction Of Baseline IOP
- Severe Damage - 40-50% Reduction Of Baseline IOP

**Clinical Pearls**
- Correlate visual field to optic nerve and NFL
- Use visual fields to confirm optic nerve damage rather than diagnose glaucoma
- Look for pattern recognition of glaucomatous visual field defects, asymmetry and repeatability
- Use visual fields to quantify optic nerve damage and set target pressures

**Case EJ**
- 52 yowm
- PMH: HTN, DM
- POH
+ Strong family history of glaucoma
  - Father and brother with glaucoma
  - Referred by PC doc for Diabetic Screening

**Case EJ**
- VA 20/20 OD 20/20 OS
- PERRLA –APD
- CF: FTFC OU
- SL See Slide
- TA 36 OD 28 OS
- Gonio shows open angles

**Case EJ**
- CCT 604/600
- IOP 36, 32, 28 OD 28, 28, 22 OS

**Quantify the Amount of Glaucoma Damage**
- 1. Severe
- 2. Moderate
- 3. Mild
- 4. None

**What is your Management?**
- Treat vs Observe?
- How aggressive do you treat?
- What is your target pressure?
- How closely do you follow?

**Clinical Pearls**
- Correlate visual field to optic nerve and NFL
- Be skeptical when visual field loss does not match optic nerve
  - Poor visual field tester
  - Learning curve
  - Other disease entities
- Use 24-2 Sita-Standard as default visual field test and Sita Fast for patients that have fatigue difficulties
- When you have a poor visual field tester, you should not use visual fields to diagnose or follow for progression

**How Much Attention Should We Pay to Reliability Indexes?**

**A Normal Visual Field Does Not Exclude Glaucoma**
- Overlap of Receptor Sites in the Retina
- Lose 20-40% of Ganglion Cells Before You Get a 5-10dB Reduction on Automated
Perimetry
- A Normal Visual Field Excludes Advanced Glaucoma, But Does Not Rule Out Glaucoma
- A Minority of Patients Will Show Innocuous Fields Despite Considerable Glaucoma Damage
- The Visual Field Will Eventually Catch Up to the Optic Nerve

What About SWAP and FDT?
- Compared SAP (Sita), SWAP and FDT for detecting glaucoma damage.
- “SWAP is markedly less efficient than either SAP or FDT in detecting VF defects. Defects detected with FDT are equivalent to SAP and sometimes larger, this makes it a useful tool for picking up early glaucomatous defects in populations at risk.”

24-2 vs 10-2 Test Strategies

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The Most Difficult Aspect of Glaucoma Management is Determining Progression
- Compare Serial Optic Nerve/NFL Photographs
- Compare Serial GDx, OCT, HRT
- Compare Serial Visual Fields
- 55% Progressed by Disc Photos and 35% Progressed by VF’s in OHTS Study
- 89% Progressed on VFs and 11% Progressed by Optic Nerve Phototgraphs in NTG Study
- It is Difficult to Differentiate Long Term Fluctuation (can vary by 10db or greater) in the Visual Field From Glaucoma Progression

Following for Progression
- Glaucoma progression is general slow
- Important to identify rapid progressors
- Patients should be followed with various tests to judge progression (optic nerve and NFL photos, imaging devices and visual fields)
- Patient who progress at a certain target pressure need further IOP lowering
- Consider filtering surgery for patients who are rapid progressors

Variability Issues with Standard Perimetry

Clinical Pearls
- Correlate visual field to optic nerve and NFL
- Use visual fields to judge for progression in conjunction with optic nerve and NFL
photos and imaging devices

- Glaucoma Clinical Trials suggest a minimum of five or six visual fields to judge for progression
- Glaucoma Progression Analysis (GPA) can help differentiate long term fluctuation from true progression