Clinical Cases In The Management of Ocular Hypertension

COPE #41395-GL

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Disclosure Statement:
- Nothing to disclose

Please silence all mobile devices. Unauthorized recording of this session is prohibited.
Definition/Prevalence

- Elevated IOP in the absence of clinically detectable optic nerve or visual field changes using current diagnostics
- 3-6 million in the U.S.
- 4-7% of population over age 40

TEC Case

- 68yo AA female presents for Glaucoma workup 2’ to high IOP, large nerves
- OcHx: PDR OS, CSME OS p PRP, IOAx3….NS 3 OD, 2 OS
- Sys Hx: Type II c insulin control x 9yrs, Hb1Ac “average” last visit, avg FBS low 200s, HrtDz, Chol, Htn, Carotid status unknown
- Meds: 12 total
- IOPs: High 27/27, Low 22/22 ~15 total readings
ONHs
<table>
<thead>
<tr>
<th>CCT Reading</th>
<th>OD</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>484</td>
<td>505</td>
</tr>
<tr>
<td>2</td>
<td>487</td>
<td>496</td>
</tr>
<tr>
<td>3</td>
<td>483</td>
<td>489</td>
</tr>
<tr>
<td>4</td>
<td>481</td>
<td>496</td>
</tr>
<tr>
<td>5</td>
<td>480</td>
<td>491</td>
</tr>
<tr>
<td>6</td>
<td>484</td>
<td>498</td>
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<tr>
<td>7</td>
<td>478</td>
<td>479</td>
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<td>8</td>
<td>487</td>
<td>490</td>
</tr>
<tr>
<td>9</td>
<td>481</td>
<td>480</td>
</tr>
</tbody>
</table>

**Average CCT**
- OD: 482
- OS: 491

**MIOP**
- OD: 28
- OS: 25

**TIOP**
- OD: 29
- OS: 27
Management

• Patient Centric Approach
• Start Ocular Hypotensives???
• Monitor???
OHTS Design

• Convenience Study
• 1636 participants (recruitment 1994-1996)
• 40 to 80 years old-Avg 55
• IOP between 24 and 32 mm Hg in qualifying eye
• Overall mean was 24.9±2.7mmHg
• 21 mm Hg and 32 mm Hg in fellow eye
• Normal and reliable 30-2 for both eyes
• Normal optic discs in both eyes, clinical and photos

OHTS Design

- Randomized to observation or treatment group
- B-Blockers used (pre-PGA)
- Goal (Med group) to reach IOP of 24 mm Hg or less and a 20% reduction from baseline
- 20% unnecessary if reach 18mmHg or lower
- POAG Outcome; development of reproducible VF abnormality (minimum 3 VFs) or reproducible optic disc deterioration attributed to POAG (2 straight)
- Recruitment pre-SLGT

Baseline Factors Predicting POAG Onset

• Baseline Age
• Vertical and Horizontal C/D ratio
• PSD
• Intraocular Pressure
• CCT 555> (mean 530.8)

5 yr Results

- Treatment reduced incidence of POAG by >50% (53.6%) at 5yrs
- African American subset by 46%
- Others by 65%
- These are Relative Risk Reductions
- Mean IOP reduction in treatment group was 22.5%±9.9% for average of 19.3±2.2

Results Cont...

- 4.4% of treated progressed
- 9.5% in untreated progressed
- ARR = 5.1%
- 90.5% of untreated patients showed no evidence of progression over 5 years
- "Eye care professionals should not prescribe eye drops for all people who have elevated eye pressure with no sign of glaucoma" –M.Kass M.D.

So What?

• "Doctors should take into account several factors, including the simple fact that 90 percent of participants in the observation group did not develop glaucoma within the five-year study period. An individual's risk of developing glaucoma, along with their health status and life expectancy, should be considered. The burden of daily treatment, including cost, inconvenience, and possible side effects, are other factors that the doctor and patient should discuss." - Chair of OHTS
Cost Effectiveness of Tx

• 4 thresholds looked at:
  1) Treat No one
  2) Treat people with ≥5% risk per year (10%)
  3) Treat those with ≥2% risk per year (30%)
  4) Treat everyone
• Treating ≥2%/yr had best health care benefit

Risk Calculators

• Framingham Prediction Model Utility in Hrt Dz
• Multivariable risk prediction models have been developed in an attempt to quantify the risk of developing OAG from OHT
• Three main 5 yr risk prediction equations exist;
  1) Full OHTS-Validated $\times 2^{1,3}$
  2) Reduced OHTS$^2$
  3) OHTS-EGPS$^3$

<table>
<thead>
<tr>
<th>Baseline Predictor</th>
<th>Points for Baseline Predictor</th>
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<tr>
<td>Age (yrs)</td>
<td></td>
</tr>
<tr>
<td>&lt;45</td>
<td></td>
</tr>
<tr>
<td>45 to &lt;55</td>
<td></td>
</tr>
<tr>
<td>55 to &lt;65</td>
<td></td>
</tr>
<tr>
<td>65 to &lt;75</td>
<td></td>
</tr>
<tr>
<td>≥75</td>
<td></td>
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<tr>
<td>Mean IOP (mmHg)*</td>
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</tr>
<tr>
<td>&lt;22</td>
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<tr>
<td>22 to &lt;24</td>
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<td>24 to &lt;26</td>
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<td>26 to &lt;28</td>
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<tr>
<td>≥28</td>
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<tr>
<td>Mean CCT (μm)*</td>
<td></td>
</tr>
<tr>
<td>≥600</td>
<td></td>
</tr>
<tr>
<td>576–600</td>
<td></td>
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<tr>
<td>551–575</td>
<td></td>
</tr>
<tr>
<td>526–550</td>
<td></td>
</tr>
<tr>
<td>≤525</td>
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</tr>
<tr>
<td>Mean vertical cup-to-disc ratio by contour*</td>
<td></td>
</tr>
<tr>
<td>&lt;0.3</td>
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<tr>
<td>0.3 to &lt;0.4</td>
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</tr>
<tr>
<td>0.4 to &lt;0.5</td>
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</tr>
<tr>
<td>0.5 to &lt;0.6</td>
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</tr>
<tr>
<td>≥0.6</td>
<td></td>
</tr>
<tr>
<td>Mean PSD (dB)*</td>
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</tr>
<tr>
<td>&lt;1.8</td>
<td></td>
</tr>
<tr>
<td>1.8 to &lt;2.0</td>
<td></td>
</tr>
<tr>
<td>2.0 to &lt;2.4</td>
<td></td>
</tr>
<tr>
<td>2.4 to &lt;2.8</td>
<td></td>
</tr>
<tr>
<td>≥2.8</td>
<td></td>
</tr>
<tr>
<td>Sum of points</td>
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<tr>
<td>0–6</td>
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<td>7–8</td>
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<td>9–10</td>
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<tr>
<td>11–12</td>
<td></td>
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<tr>
<td>≥12</td>
<td></td>
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<tr>
<td>Estimated 5-yr risk of POAG</td>
<td></td>
</tr>
<tr>
<td>≤4.0%</td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>≥33%</td>
<td></td>
</tr>
</tbody>
</table>

http://ohts.wustl.edu/risk/calculator.html

Continuous Method

http://ohts.wustl.edu/risk/calculator.html
• “Prediction Models often do not generalize beyond the population used to derive them, and so it is widely accepted that a prediction model should not be applied in clinical practice before it has been validated in at least one other population and preferably by different investigators”

OHTS-EGPS Validation

• Data from two randomized controlled trials and two observational studies were analyzed individually
• Goal to assess transferability of the prediction equation between different geographical locations and settings in UK, Netherlands
• Analysis based on 393, 298,188 and 159pts
• OHTS-EGPS risk prediction equation generally discriminated well in estimating the 5-year risk of OAG but was not well calibrated in all populations
• Further evaluation in a population based setting is needed
Prediction Pratfalls

- May have insufficient IOP readings to achieve useful mean for calculation
- “Means” model is eye specific
- Considering inter-eye asymmetry or simply using the “worst” baseline eye may increase predictive accuracy
- Inter-observer variability with Vertical C/D may lead to under/over prediction of risk
- Other risk factors FHx, Disc heme, PEX not included
- Equation has not been updated since initial publication, may need future research updates to reflect the role and impact of other risk factors in order to improve predictive ability.

### 10yr Projected OAG

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Observation</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>POAG %</td>
<td>CCT</td>
</tr>
<tr>
<td>Lowest Risk (&lt;6%/5yr)</td>
<td>7%</td>
<td>608</td>
</tr>
<tr>
<td>Moderate Risk (6-13%)</td>
<td>18%</td>
<td>573</td>
</tr>
<tr>
<td>High Risk (&gt;13%)</td>
<td>42%</td>
<td>541</td>
</tr>
</tbody>
</table>


#aaoptom14
OHTS-Phase II

- How to determine when treatment should be initiated
- Most effective approach will depend on whether there is a penalty for delaying treatment
- Compared cumulative proportion of participants who developed POAG in the medication group (13yrs c meds) vs. observation group (7.5yrs s meds, 5.5 yrs c)

13yr Results

- 1159 pts active at 13yr
- Median f/u time to Dx of POAG 7.0yrs
- Avg was 6 yrs in Observation, 8.7 years in Tx
- 14.1% developed POAG in Tx group
- 20.0% developed POAG in observation group

Probability of POAG

13yr Conclusions

• No evidence to support increased incidence of POAG in observation group after treatment initiated
• Early Treatment decreases cumulative incidence of glaucoma
• Delaying treatment only results in small increase in overall frequency of POAG
• African American participants did not differ in rate of conversion vs other races whom had similar baseline risk factors i.e. thin CCT and increased VCD

Wait a Second!!!

- A second phase of the trial in which all participants were offered IOP-lowering medication, demonstrated that the rate of conversion to primary open-angle glaucoma (POAG) was lower in those participants who had been randomized initially to treatment, that is \textit{that delaying treatment in the observation group affected the average status negatively, especially in higher-risk participants.}
1st Risk Tertile <6%/5yr

13 yr POAG Development: 8% Observation 7% Tx


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13 yr POAG Development: 19% Observation 14% Tx


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3rd Tertile >13%/5y

13 yr POAG Development: 40% Observation  28% Tx


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Number Needed to Treat

- First Tertile: 98
- Second Tertile: 16
- Third tertile: 7

- Take Home: >13% Tx is an absolute benefit
  <6%   Tx offers Little Benefit

“We believe individualized assessment of the risk of developing glaucoma will be useful to patients and clinicians for deciding on the frequency of examinations and testing as well as the possible administration of preventative treatment. Clinicians need to consider the patient’s age, health status, life expectancy, and personal preferences when making such decisions.”

Expert Actions

- 58 members of American Glaucoma Society
- 100 OHT cases, 50 without risk calculator, 50 with
- Without the risk calculator treatment threshold was 23% chance of conversion to glaucoma over 5yrs (4.6%/yr)
- With calculator decreased to 17% (3.4%/yr), increased consistency
- Recall Cost of living adjustment recommends 2%/yr
- Weinreb et al. 3%/yr absolute, 1-3%/yr discuss

1) Boland MV, Quigley HA, Lehmann HP. *J Glaucoma* 2008;17:631–638
Risk-Estimate Effect

- Different Treatment recommendations in 1/3 of scenarios
- Recommendations became less inconsistent and more confident
- Average risk threshold for recommending treatment moved closer to values suggested by expert opinion and cost-benefit analysis
- Recommendations that incorporated risk factors in a manner more consistent with OHTS results

Jampel H, Boland MV. Calculating the “Threshold to Treat” in Ocular Hypertension. *J Glaucoma* 2013; Epub
This calculator provides an estimate of the IOP that would result in a particular level of risk for developing glaucoma. Please enter values for your patient's age, pattern standard deviation, central corneal thickness, vertical cup-disc ratio, and for your desired risk of conversion to glaucoma in 5 years.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>58 years (40-90)</td>
</tr>
<tr>
<td>Pattern Standard Deviation</td>
<td>1 dB (0.50-4.00)</td>
</tr>
<tr>
<td>Central Corneal Thickness</td>
<td>491 microns (450-700)</td>
</tr>
<tr>
<td>Vertical Cup to Disc</td>
<td>0.6 0 to 0.9</td>
</tr>
<tr>
<td>Threshold for 5-year risk of progression</td>
<td>20 Percent</td>
</tr>
</tbody>
</table>

Limitations

- This calculator is based on the combined analysis of the Ocular Hypertension Treatment Study and the European Glaucoma Prevention Study and so application of the results to patients not eligible for those studies should be done with caution.
- There are certainly unidentified risk factors for the development of glaucoma that are not incorporated in this calculator.
- Threshold to treat values less than 22 mmHg should be interpreted with caution.
- This calculator is not intended for use in patients with known glaucomatous optic nerve damage.

http://oil.wilmer.jhu.edu/threshold/  #aaoptom14
EMGT Natural History

• Data on the natural Hx of Glaucoma is limited
• ½ of patients untreated for 6yrs of f/u
• After 6yrs 68% of patients had shown progression
• Over 68yo -1.48dB/yr, Under 68yo -.60dB/yr
• *Median* progression rate corresponds to going from Full field to blindness in 70yrs
• *Mean* rate corresponds to 25yrs to blindness

St. Lucia, West Indies

- 8.8% prevalence of OAG
- 205 POAG and Suspects
- 52%-73% progressed (AGIS & CIGTS criterion used)
- Cumulative probability of end stage in 10 yrs was 16%
- Probability of extensive disease was 37%
- In those showing progression 30% end stage
- 50% of end stage pts began with no VF loss

## Estimated Risk of Blindness

### Model

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OH</th>
<th>Glaucoma</th>
<th>Unilateral Blindness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk 1 (R1)</td>
<td>5 years</td>
<td></td>
<td>10 years</td>
</tr>
<tr>
<td>Risk 2 (R2)</td>
<td></td>
<td>15 years</td>
<td></td>
</tr>
<tr>
<td>Total Risk = R1 x R2</td>
<td>15 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Calculated Risk

<table>
<thead>
<tr>
<th></th>
<th>OH</th>
<th>Glaucoma</th>
<th>Unilateral Blindness</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHTS</td>
<td>5 years</td>
<td>9.5%</td>
<td>16%</td>
</tr>
<tr>
<td>St. Lucia (AGIS)</td>
<td>10 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>15 years</td>
<td></td>
<td>1.5%</td>
</tr>
<tr>
<td>OHTS</td>
<td>5 years</td>
<td>9.5%</td>
<td>27%</td>
</tr>
<tr>
<td>Olmsted</td>
<td>10 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>15 years</td>
<td></td>
<td>2.6%</td>
</tr>
</tbody>
</table>

### Reported Risk

| Olmsted        | 15 years | 10.5%    |

Case #1 Management

- Discussion with pt, informed consent
- Refer for cataract consultation
- Withhold Ocular Hypotensives
- Reassess all post cataract surgery
IOP Reduction p Phaco

• 103 eyes of 75 pts with POAG pts
• Preop IOP 15.2 ± 3.3 mmHg/Postop 13.4±2.5 mmHg
• Mean 1.8 ± 3.5 mmHg reduction
• 74% of pts had reduction
• Higher Preoperative IOP was best indicator of amount of reduction\(^1\)
• Pts with IOP>25 mmHg had average of 22.5% reduction in OHTS\(^2\)
• “Considering cataract surgery as an IOP-lowering procedure may be appropriate in select patients”\(^3\)

2) Mansberger SL, Ophthalmology 2012; 119:1826-31
Effect of Patient’s Life Expectancy on the Cost-effectiveness of Treatment for Ocular Hypertension

Steven M. Kymes, PhD; Michael R. Plotzke, PhD; Michael A. Kass, MD; Michael V. Boland, MD, PhD; Mae O. Gordon, PhD

Objective: To assess the influence of expected life span on the cost-effectiveness of treating ocular hypertension to prevent primary open-angle glaucoma.

Methods: We used a Markov simulation model to estimate the cost and benefit of ocular hypertension treatment over a person’s remaining life. We examined the influence of age on the cost-effectiveness decision in 2 ways: (1) by evaluating specific age cohorts to assess the influence of age at the initiation of treatment; and (2) by evaluating the influence of a specific life span.

Results: At a willingness to pay $50,000/quality-adjusted life year to $100,000/quality-adjusted life year, treatment of people with a 2% or greater annual risk of developing glaucoma was cost-effective for people aged 45 years with a life expectancy of at least 18 remaining years. However, to be cost-effective, a person aged 55 years must have a life expectancy of 21 remaining years and someone aged 65 years must have a life expectancy of 23 remaining years.

Conclusions: A person with ocular hypertension must have a life expectancy of at least 18 remaining years to justify treatment at a threshold of a 2% or greater annual risk of developing glaucoma. Persons at higher levels of risk require a life expectancy of 7 to 10 additional years to justify treatment.

Life Expectancy

LIVING PROOF THAT WE NEED TO SUSTAIN OUR PATIENTS VISUAL FUNCTION LONGER.
Glaucoma Continuum


#aaoptom14
Case #2

- 55 yo WM labeled OcHtn
- IOP Range OD: 20-26 (6 readings) 8:00-1:00
  OS: 20-32 (6 readings) 8:00-1:00
- Pachs: OD: 509 OS: 512
- ORA:  IOPcc  IOPg  CH  WS
  OD:  28.9   26.4  7.1  6.0
  OS:  31.4   28.0  6.1  7.0
- ONHs: Next Slide
- VFs: 2 VFss total performed, latest attached
ONH Photos Case #2
VF Case #2
On the Continuum???
# Risk Prediction

## LIMITATIONS and CAUTIONS
---The prediction methods presented here are derived from two studies (OHTS and EGPS) and should be useful to clinicians and patients. There is no guarantee that the predictions are accurate for individual patients.
---The predictions are more likely to be accurate for patients who are similar to the patients studied in the OHTS and the EGPS, and if the testing protocols resemble those used in these studies.
---These methods were derived from studies on the development of early POAG. It is not clear whether these methods also predict progression of established disease or the development of visual disability.

## FACTORS

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>RIGHT EYE MEASUREMENTS</th>
<th>LEFT EYE MEASUREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>55</td>
<td></td>
</tr>
<tr>
<td><strong>Untreated Intraocular Pressure</strong></td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>(mm Hg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Corneal Thickness</strong></td>
<td>509</td>
<td>509</td>
</tr>
<tr>
<td>(microns)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Vertical Cup to Disc Ratio by Contour</strong></td>
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<tr>
<td><strong>Pattern Standard Deviation</strong></td>
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<tr>
<td>Humphrey (dB)</td>
<td></td>
<td></td>
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<tr>
<td>Octopus loss variance (dB)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The patient's estimated 5-year risk (%) of developing glaucoma in at least one eye is 16.1%.
This calculator provides an estimate of the IOP that would result in a particular level of risk for developing glaucoma. Please enter thickness, vertical cup-disc ratio, and for your desired risk of conversion to glaucoma in 5 years.

Age: 55 years (40-90)
Pattern Standard Deviation: 1.0 dB (0.50-4.00)
Central Corneal Thickness: 512 microns (450-700)
Vertical Cup to Disc: 0.6 0 to 0.9
Threshold for 5-year risk of progression: 15 Percent
Estimated threshold to initiate treatment: 21 mmHg
True IOP?

- DCT
- ORA
- Corneal Hysteresis vs Corneal Pachymetry
- TAG vs DCT vs ORA
- “Gold Standard” is flawed
Case #3

• 63 yo WM
• Hx of Glaucoma x 30 yrs
• Pt using Carteolol bid OU, Latanoprost qhs OU
• Seen q6mo by outside provider
• IOP OD: 21mmHg  OS: 21mmHg @8:00AM
Continue Meds???
Case #3 1mo f/u

- Pachs      OD: 669  OS: 661 Repeated x3
- ORA       IOPg  IOPcc  CH    WS
  OD:  18.7  16.0  12.9  6.7
  OS:  17.4  15.6  12.3  7.2
- IOP on Monotherapy (Ocupress D/C)
  OD:  25mmHg  OS: 25mmHg
### Risk of OAG?

**FACTORS**

<table>
<thead>
<tr>
<th></th>
<th>RIGHT EYE MEASUREMENTS</th>
<th>LEFT EYE MEASUREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>63</td>
<td></td>
</tr>
<tr>
<td><strong>Untreated Intraocular Pressure (mm Hg)</strong></td>
<td>32 32 32</td>
<td>32 32 32</td>
</tr>
<tr>
<td><strong>Central Corneal Thickness (microns)</strong></td>
<td>658 658 658</td>
<td>658 658 658</td>
</tr>
<tr>
<td><strong>Vertical Cup to Disc Ratio by Contour</strong></td>
<td>0.20</td>
<td>0.15</td>
</tr>
<tr>
<td><strong>Pattern Standard Deviation</strong></td>
<td>0.5 0.5</td>
<td>0.5 0.5</td>
</tr>
<tr>
<td>Humphrey (dB)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Octopus loss variance (dB)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The patient's estimated 5-year risk (%) of developing glaucoma in at least one eye: **1.3%**

http://ohts.wustl.edu/risk/calculator.html

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#aaoptom14
This calculator provides an estimate of the IOP that would result in a particular level of risk for developing glaucoma. Please enter values for age, pattern standard deviation, central corneal thickness, vertical cup-disc ratio, and for your desired risk of conversion to glaucoma in 5 years.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>63 years (40-90)</td>
</tr>
<tr>
<td>Pattern Standard Deviation</td>
<td>.5 dB (0.50-4.00)</td>
</tr>
<tr>
<td>Central Corneal Thickness</td>
<td>669 microns (450-700)</td>
</tr>
<tr>
<td>Vertical Cup to Disc</td>
<td>0.2 to 0.9</td>
</tr>
<tr>
<td>Threshold for 5-year risk of progression</td>
<td>15 Percent</td>
</tr>
</tbody>
</table>

Estimated threshold to initiate treatment: >32 mmHg
Low Threshold

This calculator provides an estimate of the IOP that would result in a particular level of risk for developing glaucoma. Please enter the following parameters: thickness, vertical cup-disc ratio, and for your desired risk of conversion to glaucoma in 5 years.

Age: 63 years (40-90)
Pattern Standard Deviation: .5 dB (0.50-4.00)
Central Corneal Thickness: 669 microns (450-700)
Vertical Cup to Disc: 0.2, 0 to 0.9
Threshold for 5-year risk of progression: 4.4 Percent

Estimated threshold to initiate treatment: >32 mmHg
Case #4

- 72yo healthy wm
- Previously treated since 2007
- IOP range: OD: 24-33 (UnTx-6 readings), 20 Tx
  OS: 23-34 (UnTx-6 readings), 20 Tx
- Pachs: OD: 598
  OS: 598
- Pascal: OD: 21.4  Q=2
  OS: 21.3  Q=2
- ONHs: Attached
ONH Photos Case #4

8/23/2014 Andrew Rixon O.D, FAAO

#aaoptom14
### Risk Assessment

**Factors**

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>Points for Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>![0-45] &lt; 45, 45 to 55, 55 to &lt; 65, 65 to 75, ≥ 75</td>
</tr>
<tr>
<td>Intraocular Pressure (mm Hg) Mean</td>
<td>![&lt; 22] &lt; 22, 22 to &lt; 24, 24 to &lt; 26, 26 to &lt; 28, ≥ 28</td>
</tr>
<tr>
<td>Central Corneal Thickness (μm) Mean</td>
<td>![≥ 800] ≥ 800, 576-600, 551-575, 526-550, ≤ 525</td>
</tr>
<tr>
<td>Vertical Cup/Disc Ratio by Contour Mean</td>
<td>![&lt; 0.3] &lt; 0.3, 0.3 to &lt; 0.4, 0.4 to &lt; 0.5, 0.5 to &lt; 0.6, ≥ 0.6</td>
</tr>
<tr>
<td>Visual Field: Humphrey Pattern Standard Deviation (dB) Mean</td>
<td>![&lt; 1.8] &lt; 1.8, 1.8 to &lt; 2.0, 2 to &lt; 2.4, 2.4 to &lt; 2.8, ≥ 2.8</td>
</tr>
<tr>
<td>- OR - Octopus Loss Variance Mean</td>
<td>![&lt; 3.24] &lt; 3.24, 3.24 to &lt; 4.0, 4.0 to 5.76, 5.78 to 7.84, ≥ 7.84</td>
</tr>
</tbody>
</table>

**Sum of Points and Estimated 5-Year Risk of Developing POAG**

<table>
<thead>
<tr>
<th>Sum of Points</th>
<th>Estimated 5-Year Risk of Developing POAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>≤ 4.0%</td>
</tr>
<tr>
<td>7-8</td>
<td>10%</td>
</tr>
<tr>
<td>9-10</td>
<td>15%</td>
</tr>
<tr>
<td>11-12</td>
<td>20%</td>
</tr>
<tr>
<td>&gt;12</td>
<td>≥ 33%</td>
</tr>
</tbody>
</table>

- 10% with TAG
- <4% with DCT
Case #5

- 62yo Healthy BM
- Pachs 510, 510
- CH  5.5 OD  8.9 OS
- IOPs  31 OD   21 OS by TAG and iCare
Case #5 ONHs
#5 Risk Calculator

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>RIGHT EYE MEASUREMENTS</th>
<th>LEFT EYE MEASUREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>? Age</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>? Untreated Intraocular Pressure (mm Hg)</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>? Central Corneal Thickness (microns)</td>
<td>510</td>
<td>510</td>
</tr>
<tr>
<td>? Vertical Cup to Disc Ratio by Contour</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>? Pattern Standard Deviation Humphrey (dB) Octopus loss variance (dB)</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

The patient's estimated 5-year risk (%) of developing glaucoma in at least one eye: 12.2%
Case #6

- 52 yo AAM
- PACHS 480/480
- IOPs OD: 16-26 OS: 15-24
- CH: OD: 7.6 OS: 7.9
- Diagnostic Tests to follow
Conclusions

• OHTS data and validated risk calculators provide estimates, not absolutes
• Study of many, N of 1
• That 1 will develop glaucoma 0% or 100%
• IOP is a continuum
• Goldmann is flawed
• OHT is non-urgent
• Individualized management is mandatory
• Good clinical care vs Good pt management
Acknowledgements

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• Jennifer Sanderson O.D.
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• Questions e-mail;

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Please complete your session evaluation using EyeMAP™ online at http://eyemap.cistems.net

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