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Baseline Risk Factors for Event and Trend-Based Visual Field Glaucoma Progression Using Fourier-Domain Optical Coherence Tomography in the Advance Imaging for Glaucoma Study

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Financial Interests:
Dr. Zhang does not have any conflict of interest

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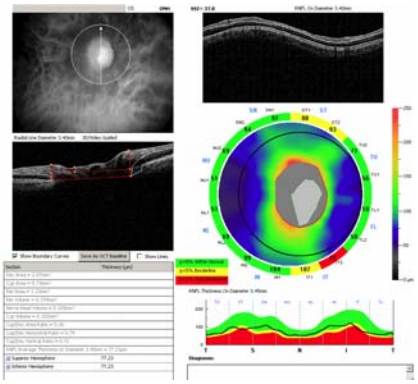
- Advanced Imaging for Glaucoma Study Group

Goal

- **To use Fourier-domain OCT to predict the chance of progression of glaucoma**

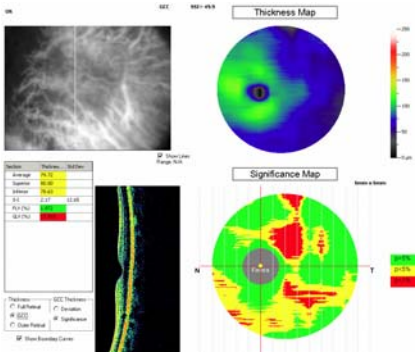
Fourier-Domain Optical Coherence Tomography

ONH scan (NFL)



Nerve fiber layer thickness map

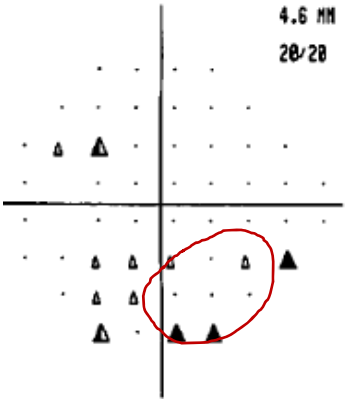
GCC scan (macula)



Ganglion cell complex thickness map

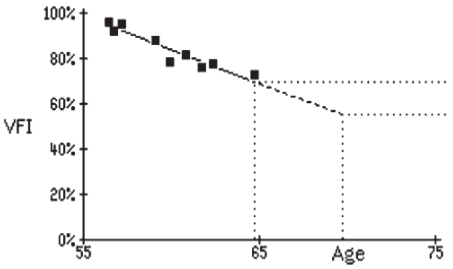
RTVue

Event and trend based glaucoma progression



Three black filled triangles

OR



Negative VFI Slope significant at P < 0.05

Subjects of the Study

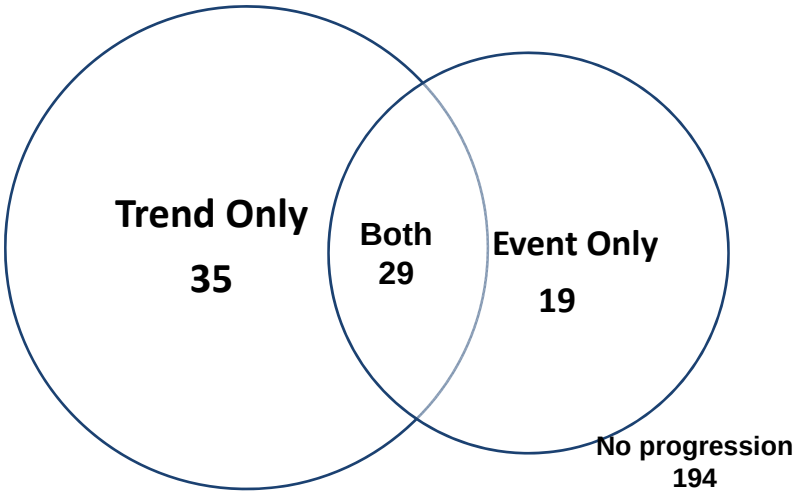
Advanced Imaging for Glaucoma Study subjects

PG	GSPPG	Normal
277 eyes (188 patients)		

median follow-up of 52 months at 6 months interval

194 eyes did not progress	83 Eyes progressed

Trend vs. Event Progression



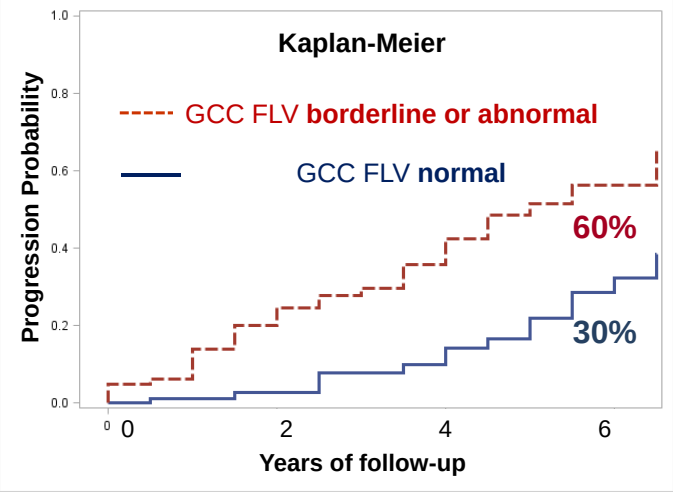
Baseline Factors That Have Significant Predictive Power on Progression

	Unit	HR	p	AROC
Central Corneal Thickness (µm)	-10	1.07	0.012	0.621
PSD (db)	1	1.06	0.013	0.587
VFI (%)	-5	1.05	0.142	0.564
NFL Inferior Quadrant (µm)	-10	1.15	0.020	0.585
NFL FLV %	1	1.08	0.002	0.631
GCC Overall (µm)	-10	1.29	0.013	0.576
GCC Inferior Hemisphere (µm)	-10	1.26	0.006	0.590
GCC GLV %	1	1.03	0.003	0.597
GCC FLV %	1	1.08	<0.001	0.632

Notable Non-Significant Variables

- Demographic:
  - Gender
  - Race
- Ocular
  - Axial length
  - IOP
- FD-OCT:
  - cup to disc ratios
  - Disc size
  - Rim size

Ganglion Cell Complex-Focal Loss Volume is the Best Single Predictor of Progression



Log-rank test p<0.001

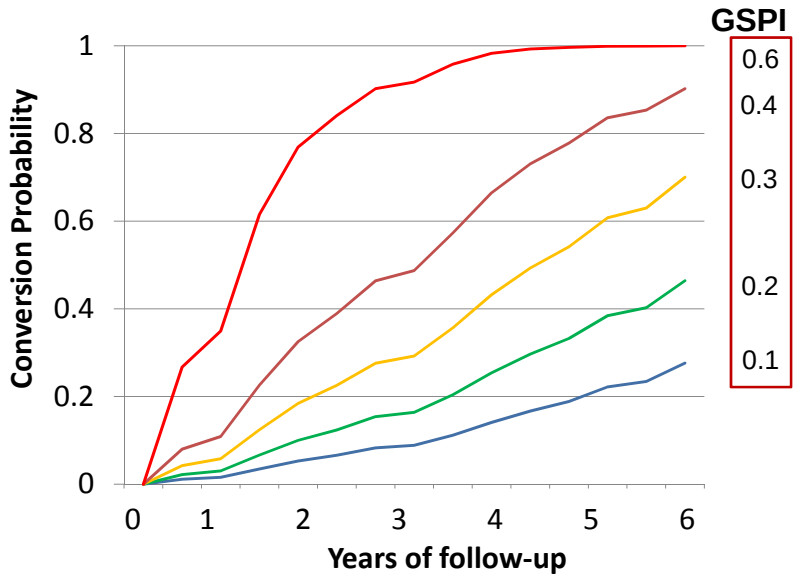
Glaucoma Structural Progression Prediction Index (GSPPI)

	Unit	Coeff.	HR	p
Age	10 years older	0.21	1.24	0.047
Central Corneal Thickness	20 microns thinner	0.11	1.12	0.049
GCC FLV	1% higher	0.07	1.08	0.001

Multivariate Cox regression

Cross validated AROC = 0.653 better than GCC FLV (p=0.03)

GSPPI Survival Curves



GSPPI Predicts Actual Progression Rate over Study Period

PG Quartile	GSPPI Range	Actual Ponversion Rate
0% - 25%	0.08 – 0.18	15.7%
25%-50%	0.18 - 0.22	27.5%
50%-75%	0.22 - 0.28	37.7%
75%-100%	0.28 - 0.54	39.1%

lowest quartile has much lower risk of VF Progression

Conclusions

- GCC FLV is the most significant predictor for glaucoma progression
- GCC FLV, corneal thickness and age can be combined into a single index to increase the prediction power.

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Advanced Imaging for Glaucoma

R01 EY013516 www.AIGStudy.net


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