

Glaucoma

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Glaucoma:

The Sneak Thief of Sight!

Definition of Glaucoma

- Family of ocular diseases characterized by progressive optic neuropathy and visual field loss
 - Gradual optic disk cupping
 - Associated visual field deficits
 - Progressive retinal ganglion cell loss
- No longer defined alone by elevated intraocular pressure (IOP)

Glaucoma



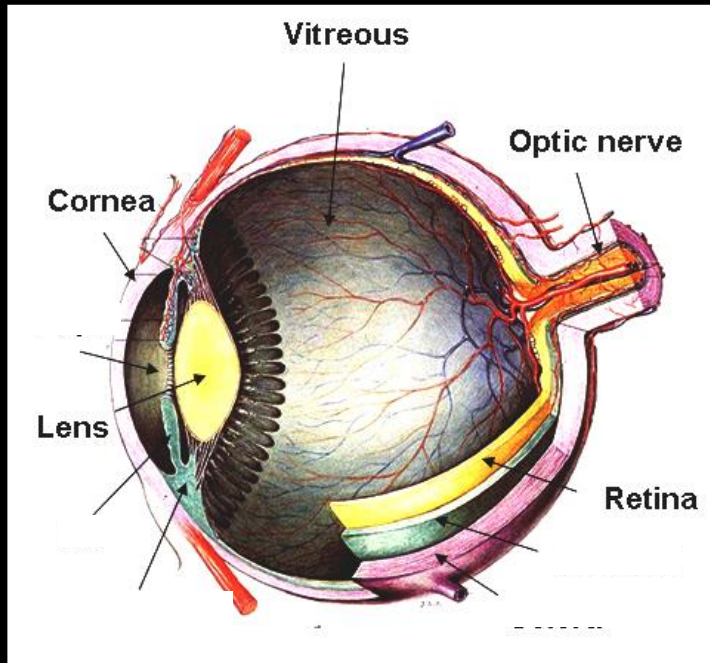
Challenges

- Identify people at risk for glaucoma
- Detect glaucoma progression earlier
- Develop better ways to treat glaucoma

Risk Factors

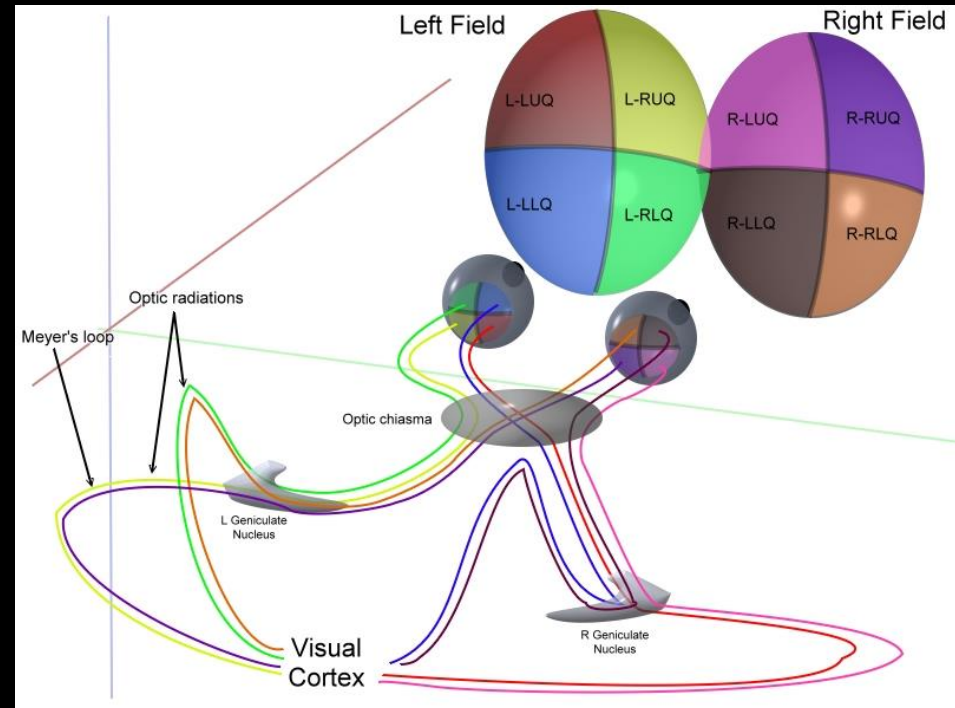
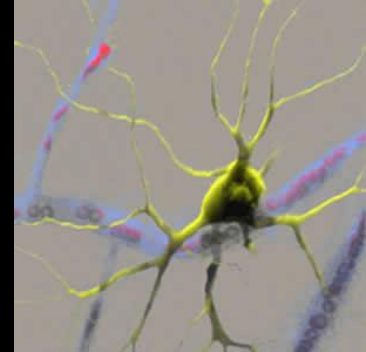
- Risk factors for the development and progression of glaucoma
 - Elevated IOP
 - Family history
 - Advanced age
 - Race
 - Genetic factors

Retina

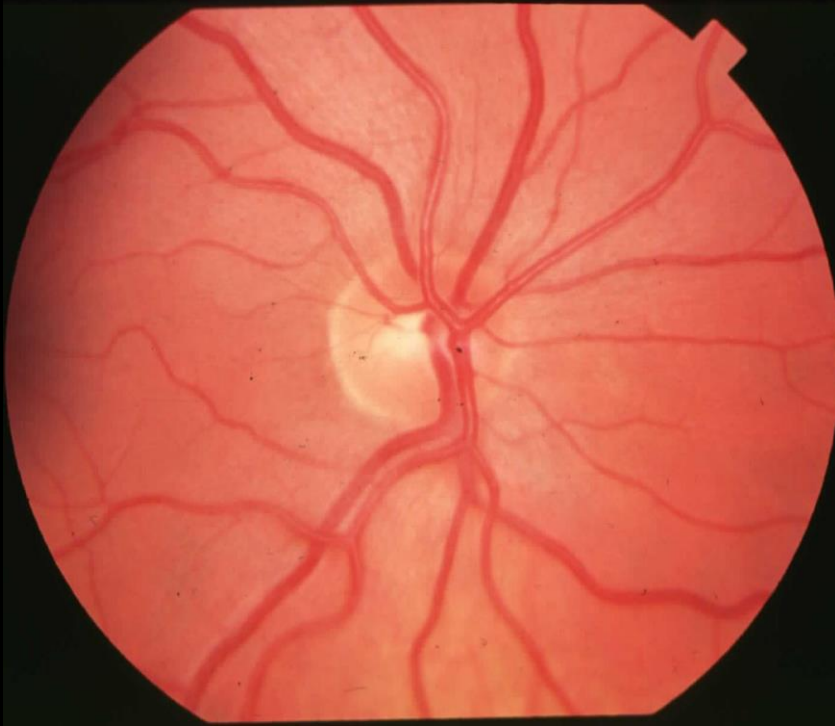


Retinal Ganglion Cell (RGC)

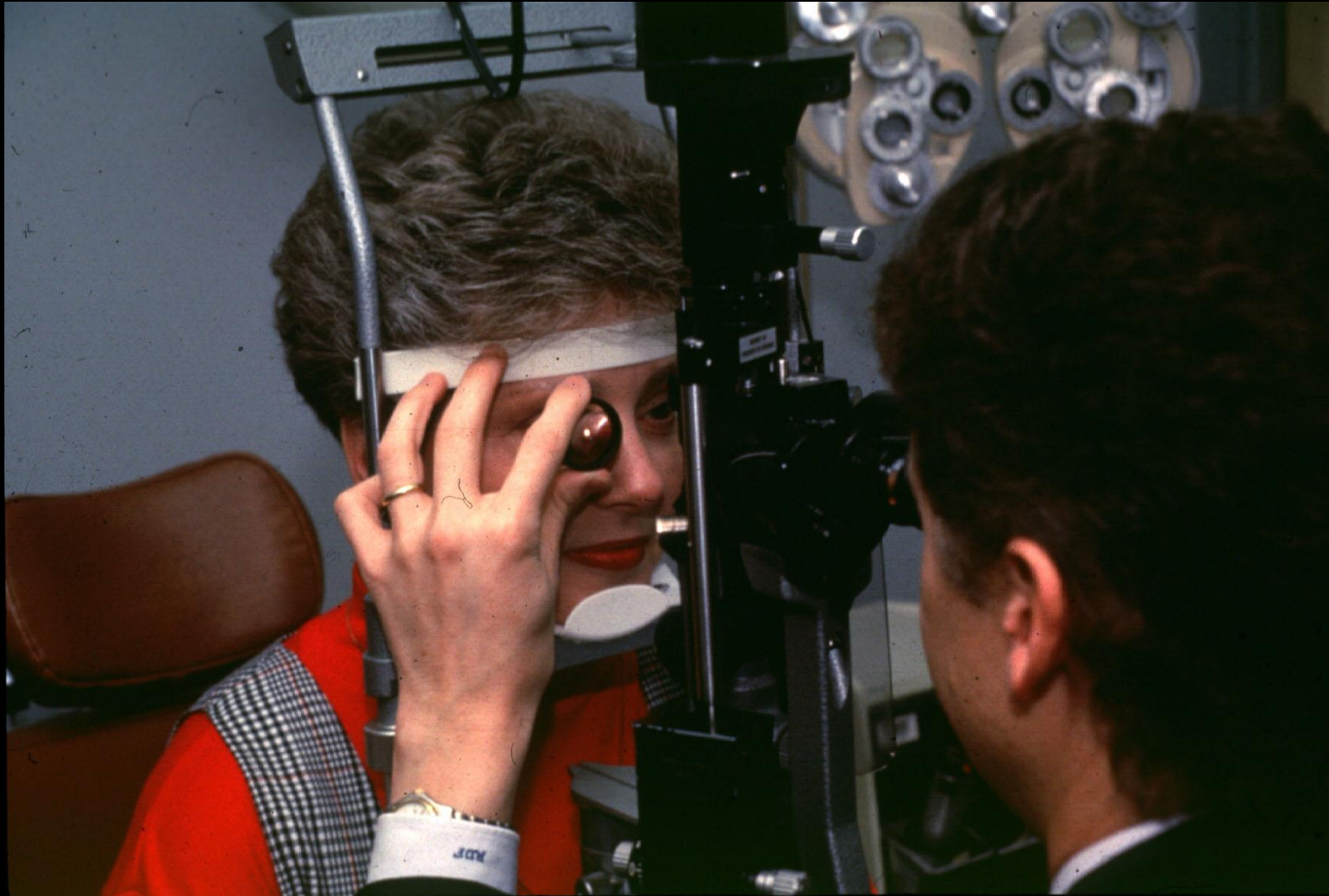
- **Axons form optic nerve**
- **Synapse on neurons in brain**
- **Susceptible in many vision disorders**
 - **Glaucoma**

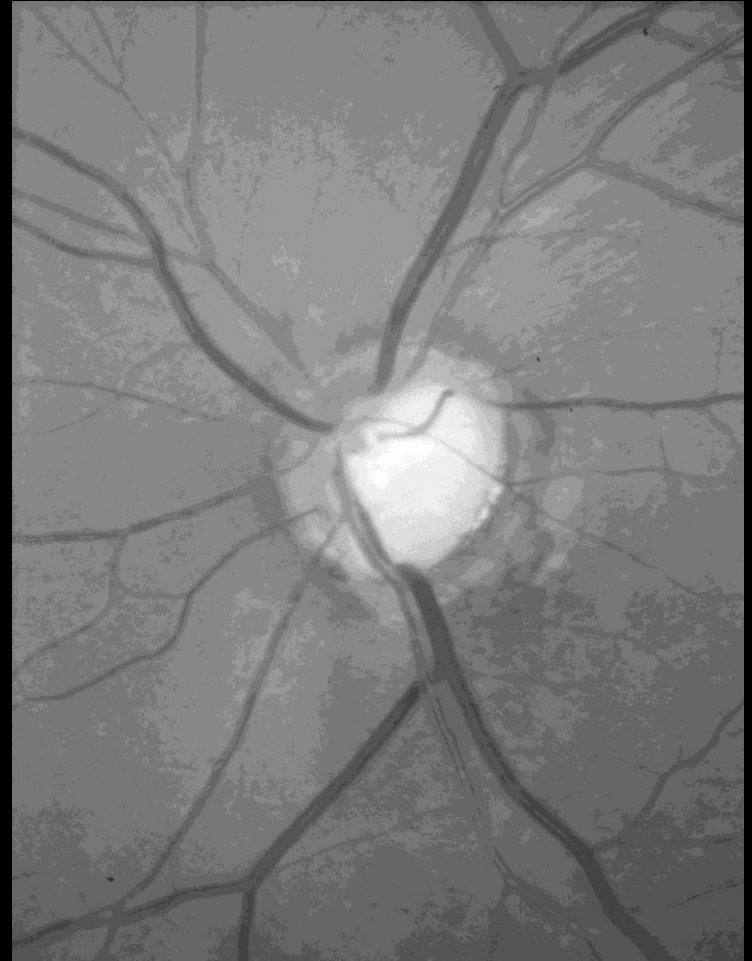
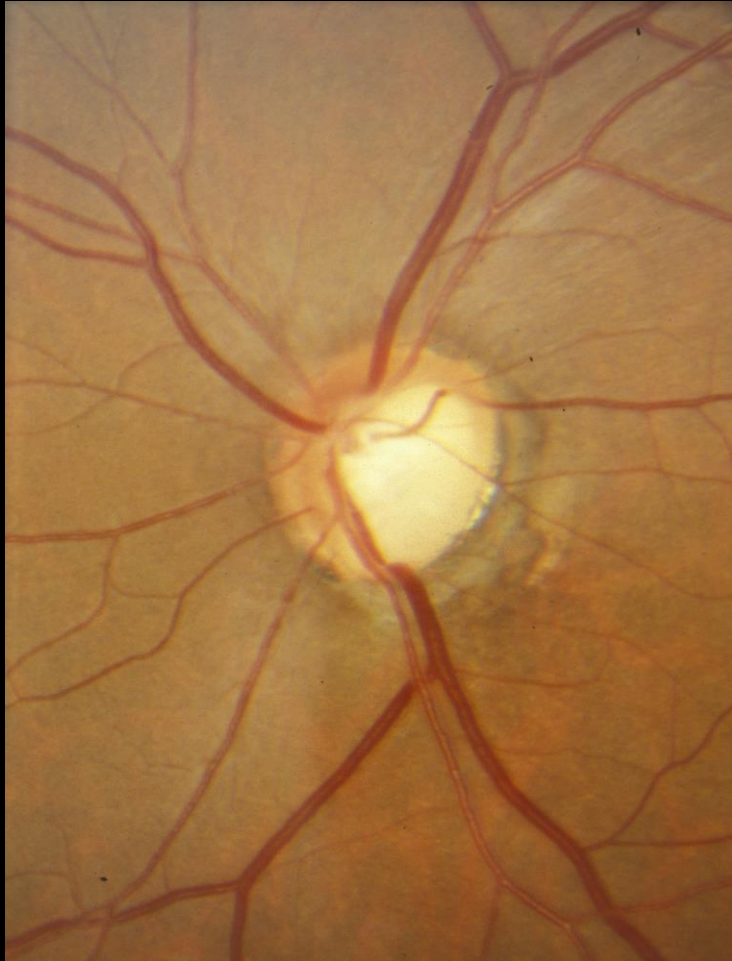


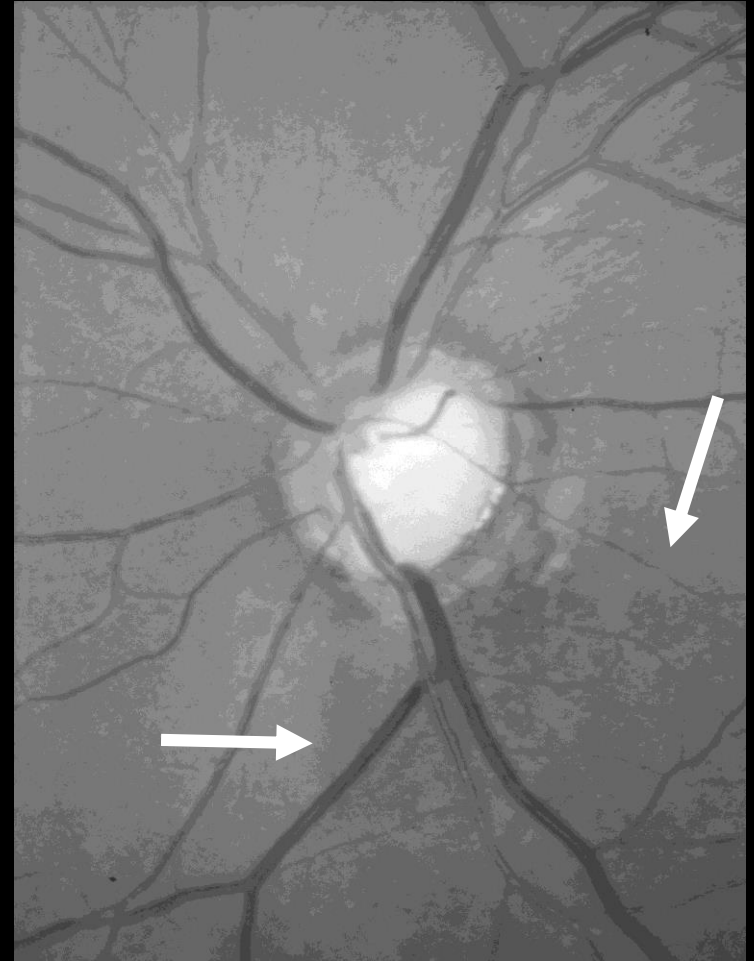
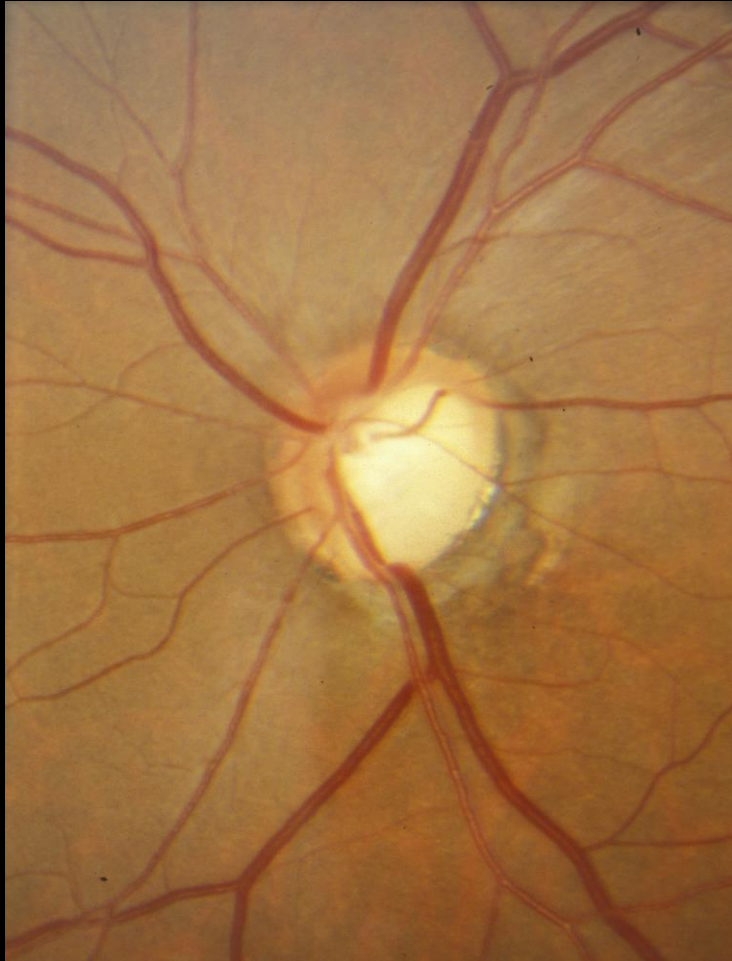
Detection



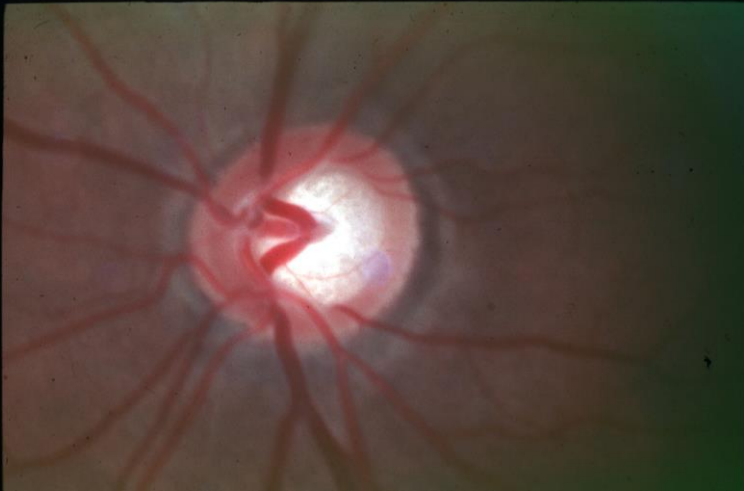
Clinical Examination





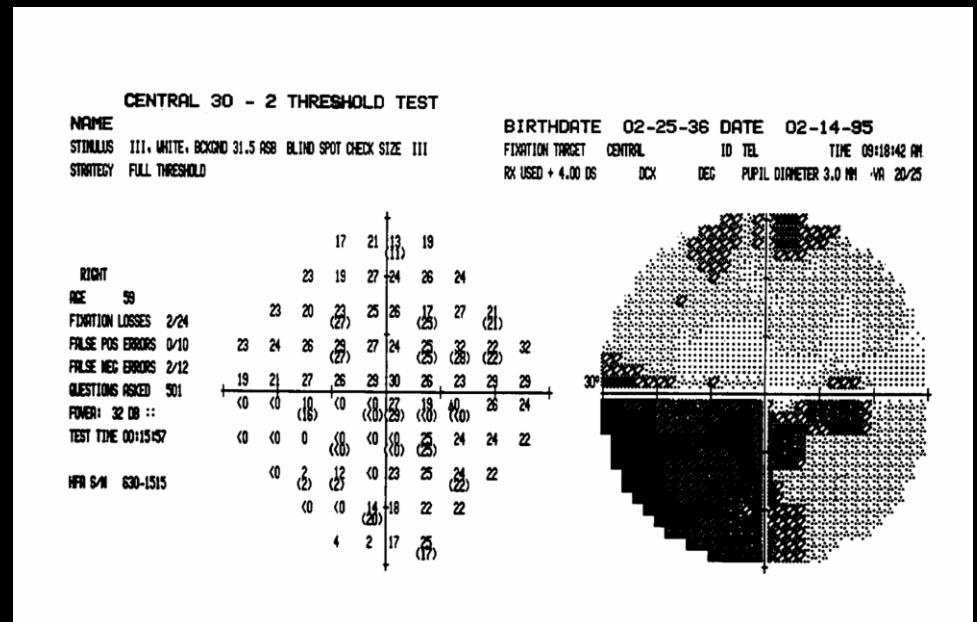
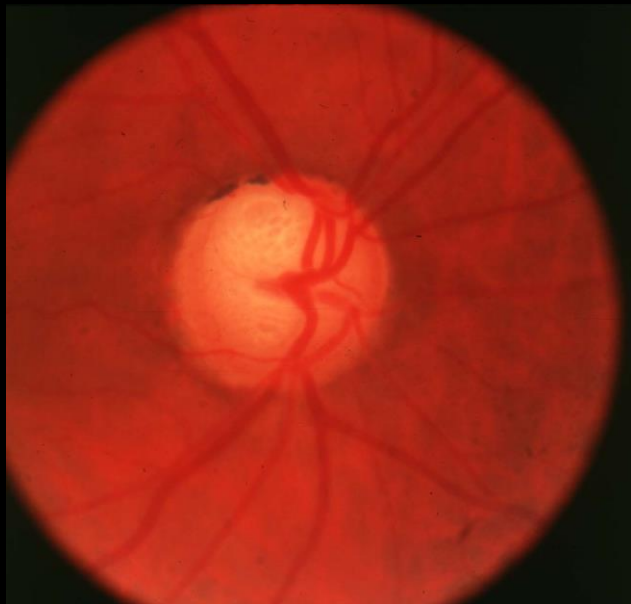


Change?



Software tools to detect glaucoma

Structure and Function



Baseline Nerves



Visual Fields



Baseline Visual Fields

SINGLE FIELD ANALYSIS

NAME: ID: EYE: RIGHT DOB: 07-12-1971

CENTRAL 24-2 THRESHOLD TEST

STIMULUS: III, WHITE

PUPIL DIAMETER:

DATE: 04-06-2005

BACKGROUND: 31.5 DB

VISUAL ACUITY:

TIME: 12:00 PM

STRATEGY: SIFT-STRONG

REL: -4.00 DS

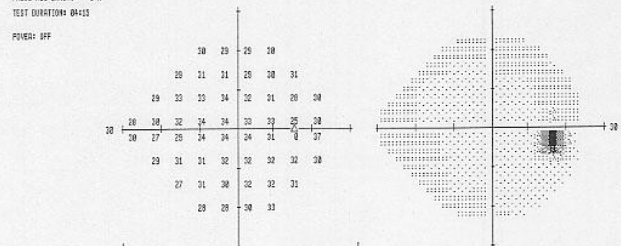
AGE: 31

FALSE POS ERRORS: 1 %

FALSE NEG ERRORS: 0 %

TEST DURATION: 04:15

POWER: OFF



GMT
WITHIN NORMAL LIMITS

MD -0.33 DB
PDI 1.55 DB

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973 972-0800

11: 0.30
12: 0.20
13: 0.10
14: 0.10

SINGLE FIELD ANALYSIS

NAME: ID: EYE: LEFT DOB: 07-12-1971

CENTRAL 24-2 THRESHOLD TEST

STIMULUS: III, WHITE

PUPIL DIAMETER:

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BACKGROUND: 31.5 DB

VISUAL ACUITY:

TIME: 12:00 PM

STRATEGY: SIFT-STRONG

REL: -4.00 DS

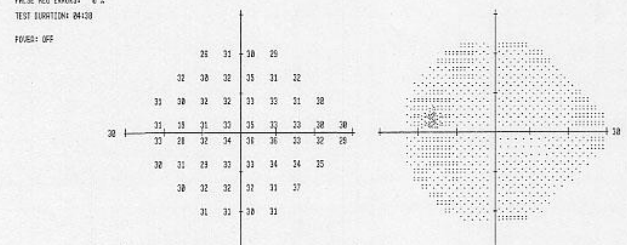
AGE: 31

FALSE POS ERRORS: 1 %

FALSE NEG ERRORS: 0 %

TEST DURATION: 04:10

POWER: OFF



GMT
WITHIN NORMAL LIMITS

MD -0.40 DB
PDI 1.62 DB

11: 0.30
12: 0.20
13: 0.10
14: 0.10

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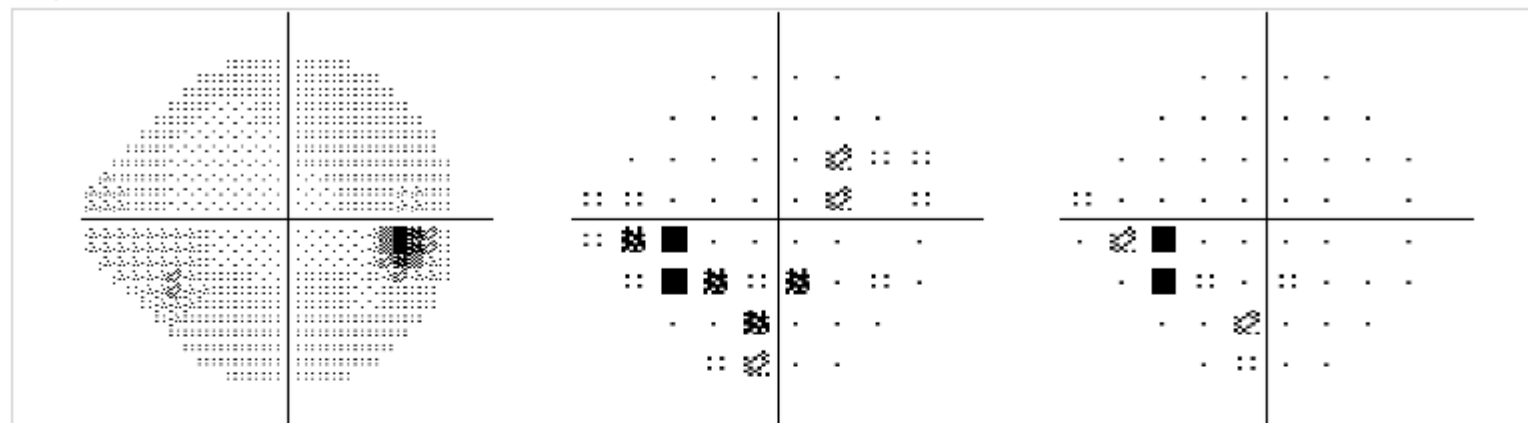
Jun 29, 2009

Central 24-2 Threshold Test

Graytone

Total Deviation

Pattern Deviation



Threshold (dB)

Total Deviation

Pattern Deviation

26 28	27 27	-2 -1	-1 -1	-2 0	-1 0
30 31 30	28 28 28	0 0 -1	-3 -2 -1	1 1 0	-2 -2 -1
28 31 34 32	29 28 27 26	-1 0 1 -1	-3 -4 -4 -4	-1 0 2 0	-2 -4 -4 -4
22 27 32 32 32	32 29 25 27	-6 -4 0 -1 -1	-1 -4 -4	-6 -3 1 0 -1	-1 -3 -4
22 24 22 32 32	31 31 28 28	-6 -6 -11 -2 -1	-3 -2 -3	-5 -6 -10 -1 -1	-2 -1 -2
26 19 28 30	29 31 29 28	-4 -13 -4 -3	-5 -2 -3 -3	-3 -12 -4 -3	-4 -1 -3 -2
28 30 27	30 29 29	-3 -2 -5	-2 -3 -2	-2 -1 -5	-1 -2 -1
26 26	28 31	-4 -5	-3 0	-3 -4	-2 1

GHT: **Outside Normal Limits**

FL: **0/14**

FP: **1%**

FN: **0%**

Fovea: **Off**

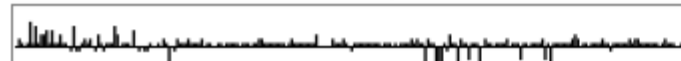
Pupil Diameter: **7.0 mm ***

Visual Acuity:

VFI: **97%**

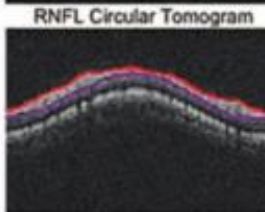
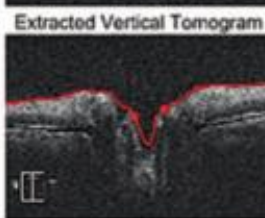
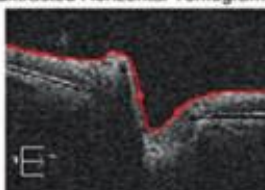
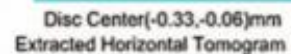
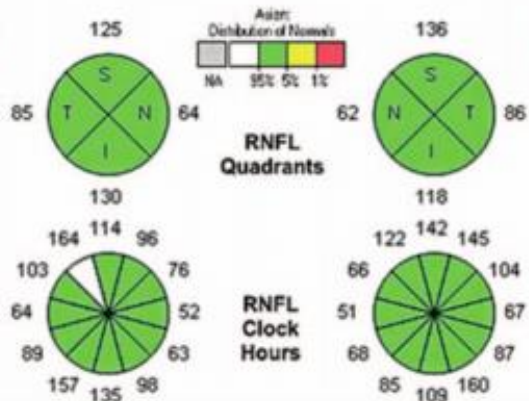
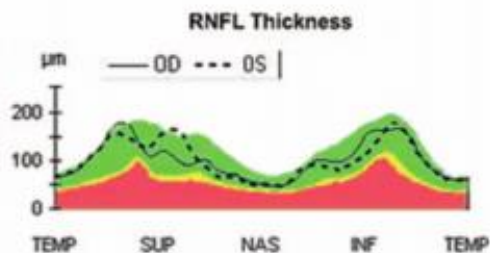
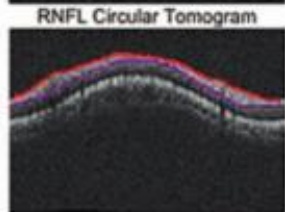
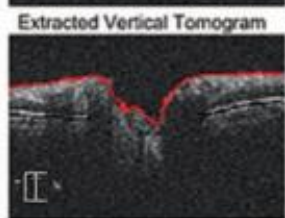
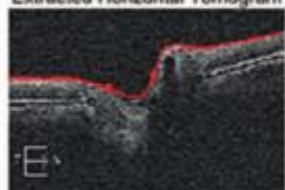
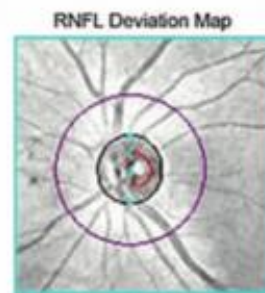
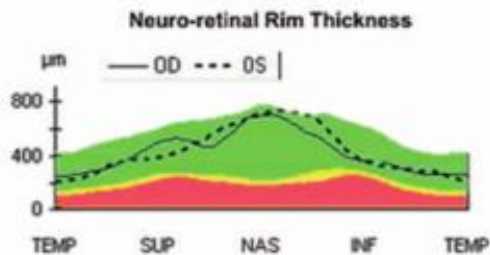
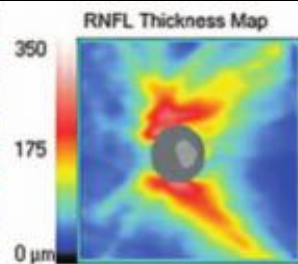
MD: **-2.85 dB P < 2%**

PSD: **2.83 dB P < 2%**

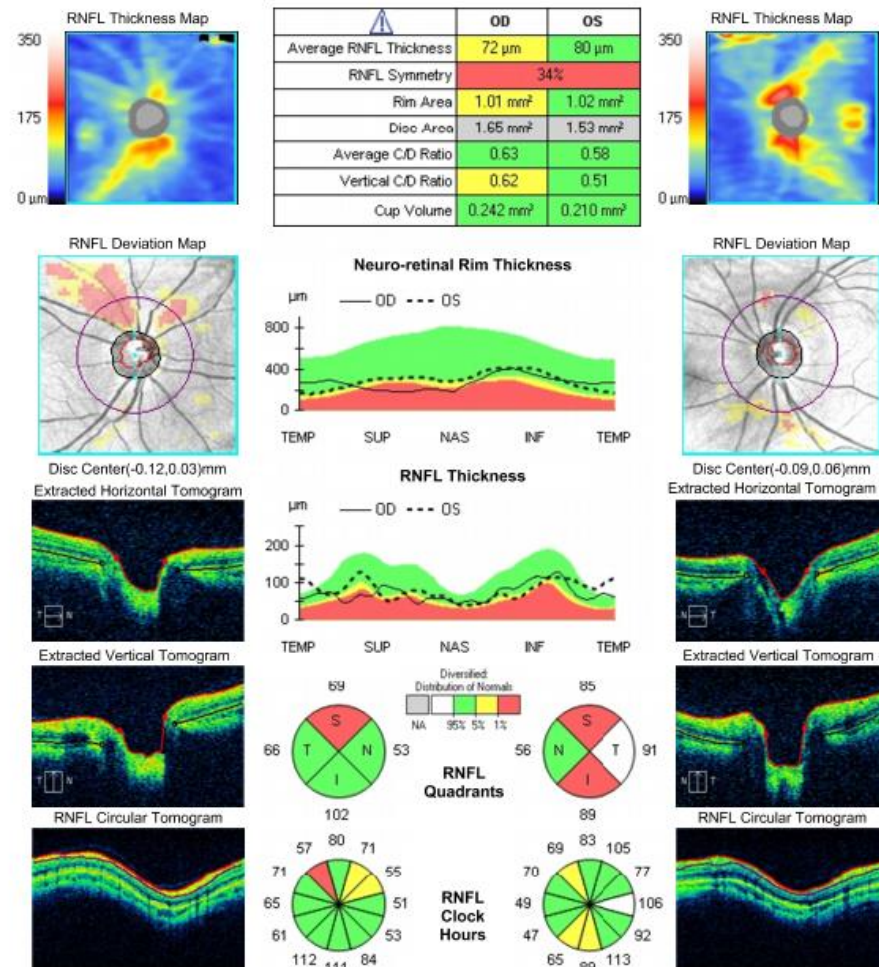


OCT





ONH and RNFL OU Analysis: Optic Disc Cube 200x200 OD ● OS ●



Comments

Doctor's Signature

CIRRUS1
 SW Ver: 6.5.0.772
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 Page 1 of 1

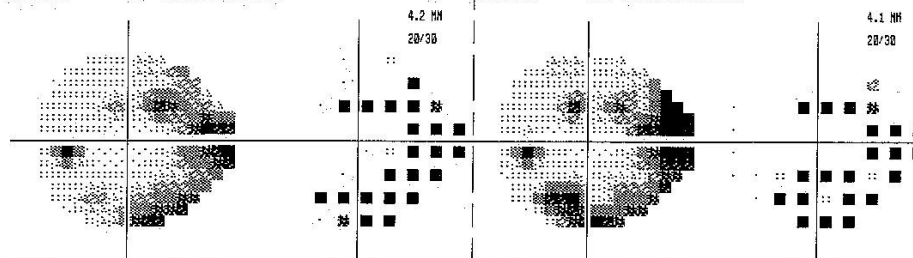
Detecting progression

EYE: LEFT

DOB: 05-22-1950

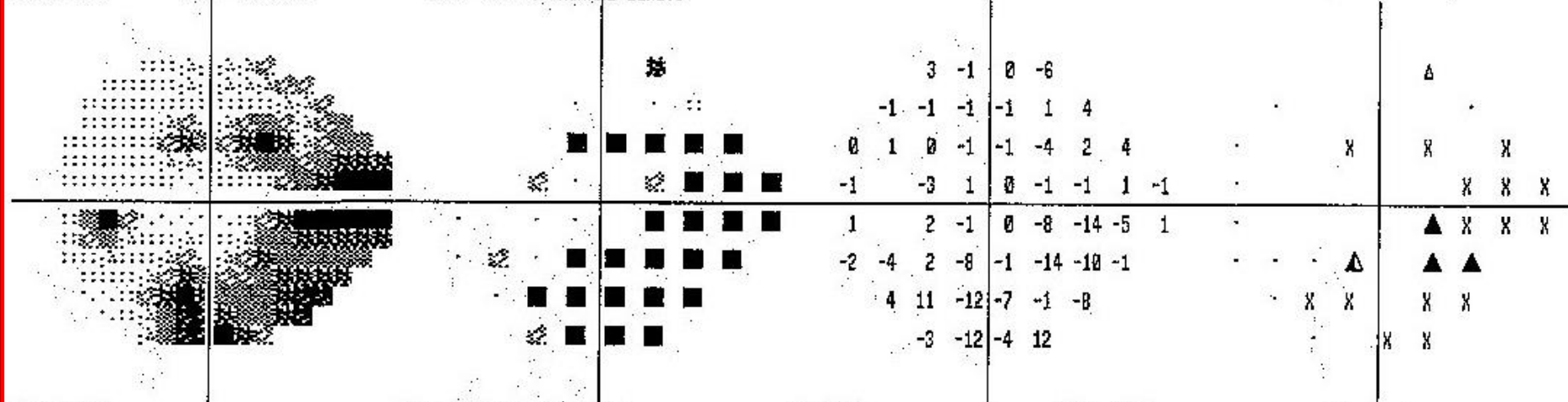
CENTRAL 24-2 THRESHOLD TEST

GRAYTONE
01-04-2000 GHT: OUTSIDE NORMAL LIMITS



PROGRESSION ANALYSIS

GHT: OUTSIDE NORMAL LIMITS



FP: 1%

LIKELY PROGRESSION

ROBERT D. FECHTNER, MD

08-03-2005 01-04-2006

:: < 5% ▲ P < 5% DETERIORATION
 ✱ < 2% ▲ P < 5% (2 CONSECUTIVE)
 ✱ < 1% ▲ P < 5% (3+ CONSECUTIVE)
 ■ < 0.5% ✕ OUT OF RANGE

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GLAUCOMA DIAGNOSTIC LABORATORY
NEW JERSEY MEDICAL SCHOOL
NEWARK, NJ 07103
973-972-2065

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HFA II 750-8684-4.2

GPA - SUMMARY

EYE: LEFT

NAME: [REDACTED]

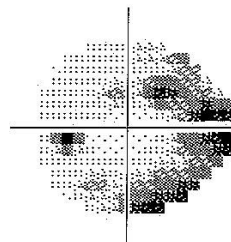
DOB: 05-22-1950

ID: [REDACTED]

BASELINE: SITA-STANDARD

 GRAYTONE
 06-22-1999 GHT: OUTSIDE NORMAL LIMITS

PATTERN DEVIATION

4.2 MM
20/30
 FL: 2/20
 FOVER: OFF
 VFI: 82%

FN: 0 %

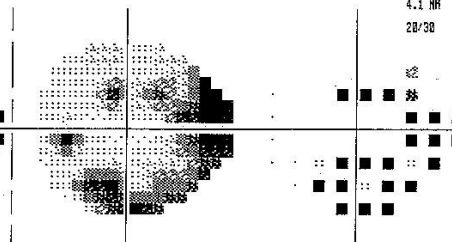
 HD: -8.50 DB P < 0.5%
 PSD: 9.24 DB P < 0.5%

FP: 0 %

CENTRAL 24-2 THRESHOLD TEST

 GRAYTONE
 01-04-2000 GHT: OUTSIDE NORMAL LIMITS

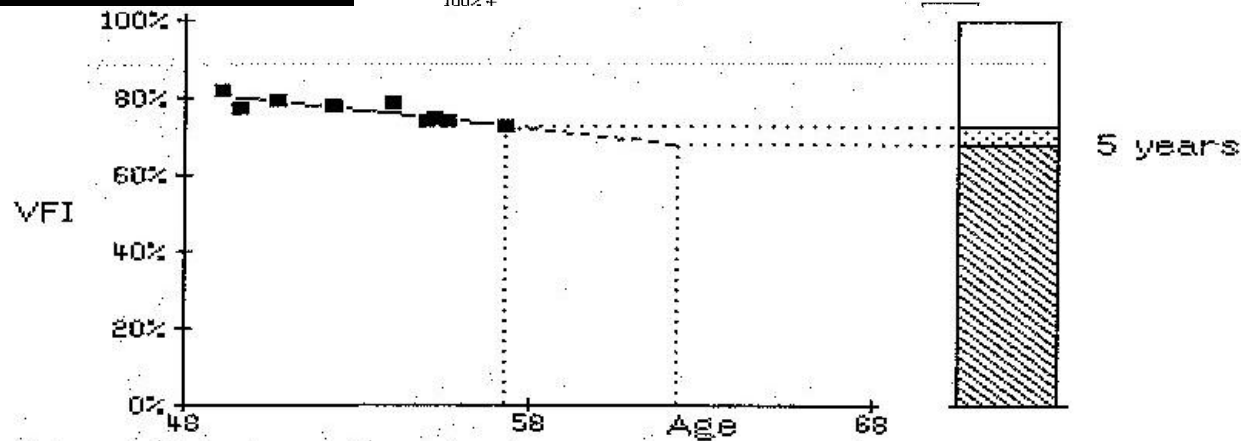
PATTERN DEVIATION

4.1 MM
20/30
 FL: 1/18
 FOVER: OFF
 VFI: 77%

FN: 0 %

 HD: -10.56 DB P < 0.5%
 PSD: 11.56 DB P < 0.5%

FP: 0 %

RATE OF PROGRESSION: -0.9 ± 0.5 %/YEAR (95% CONFIDENCE)SLOPE SIGNIFICANT AT $P < 1\%$
 FOVER: OFF
 VFI: 72%

 HD: -12.04 DB P < 0.5%
 PSD: 11.73 DB P < 0.5%

FL: 0/18

FN: 16 %

FP: 1 %

LIKELY PROGRESSION

PREVIOUS FOLLOW-UP EXAMS:

08-03-2005

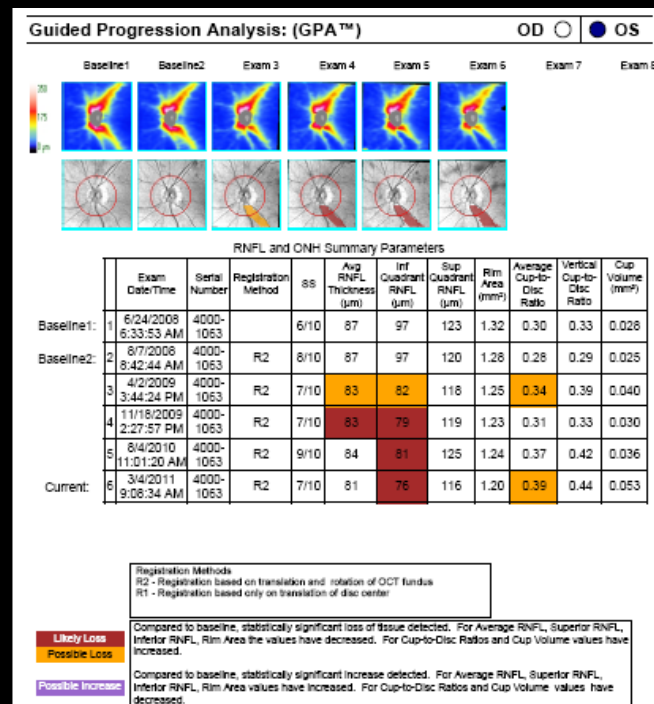
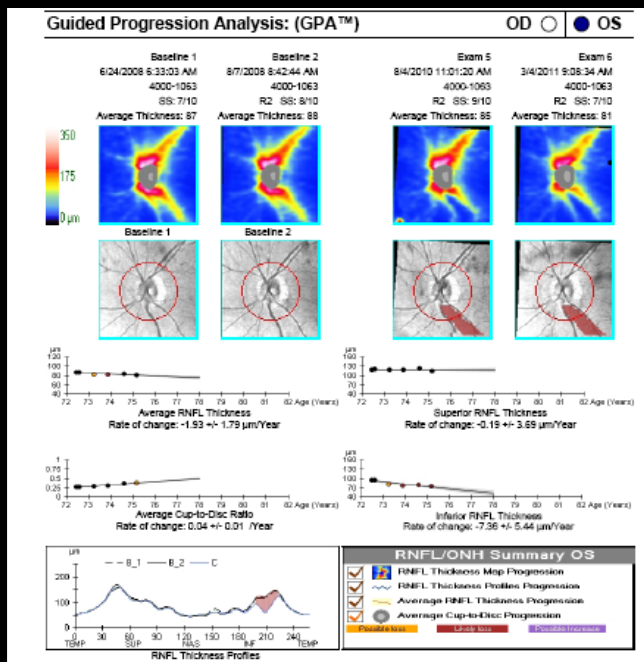
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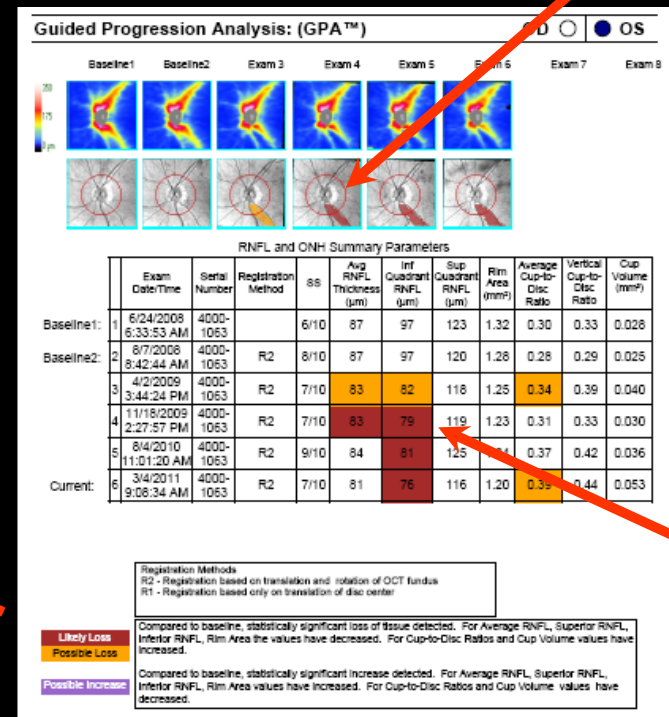
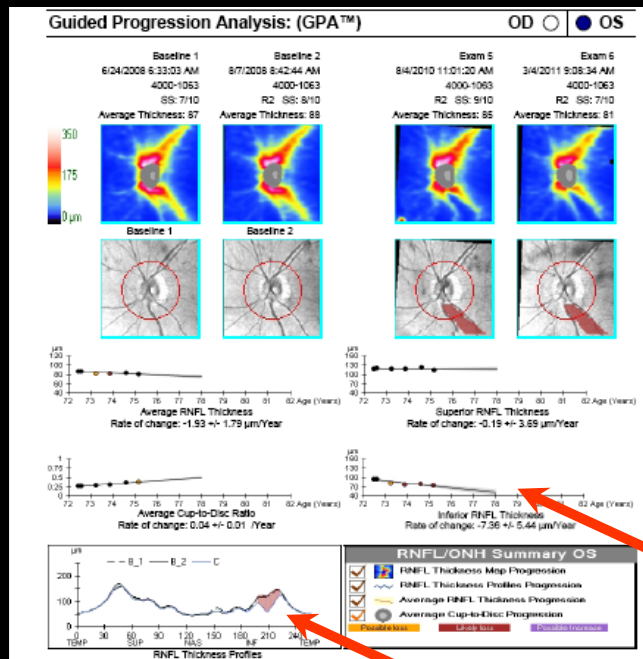
 Δ P < 5%
 ▲ P < 5% (2 CONSECUTIVE)
 ▲ P < 5% (3+ CONSECUTIVE)
 X OUT OF RANGE

NOTES:

 ROBERT D. FECHNER, MD
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Treating Glaucoma

- The primary strategy for treatment is reducing IOP
 - Data show importance of reducing IOP significantly

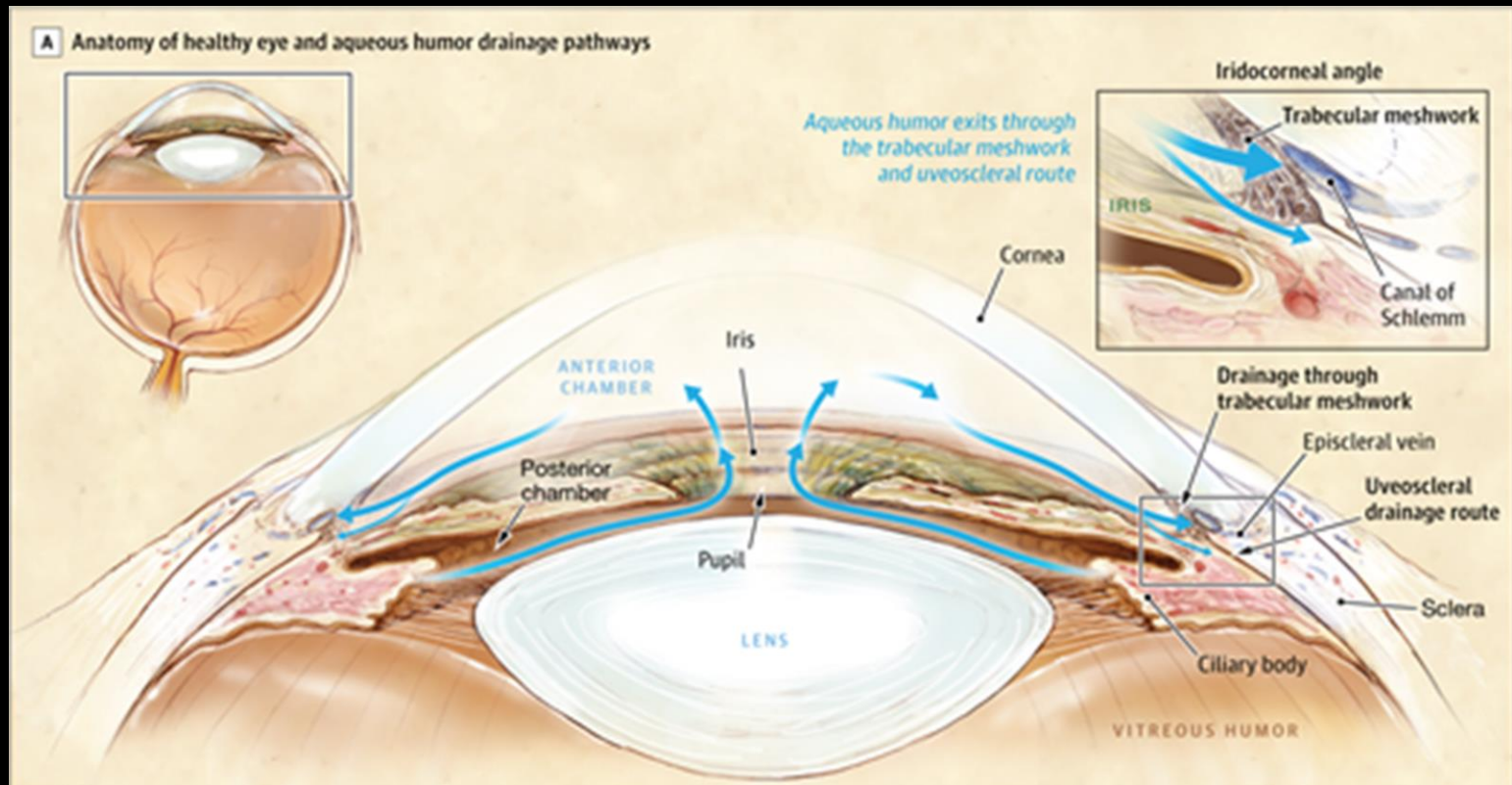
Treating Glaucoma



Meds

**Laser/
Surgery**

Treating Glaucoma



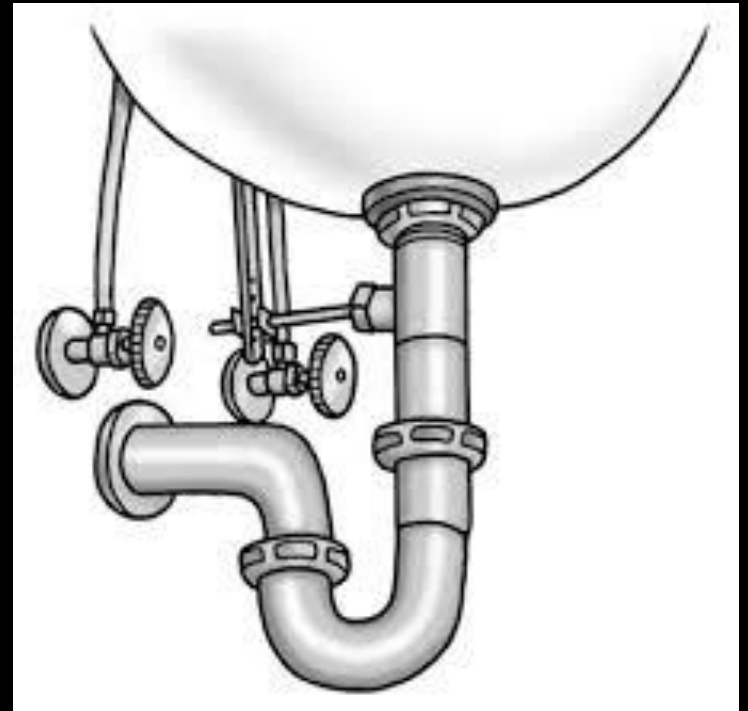
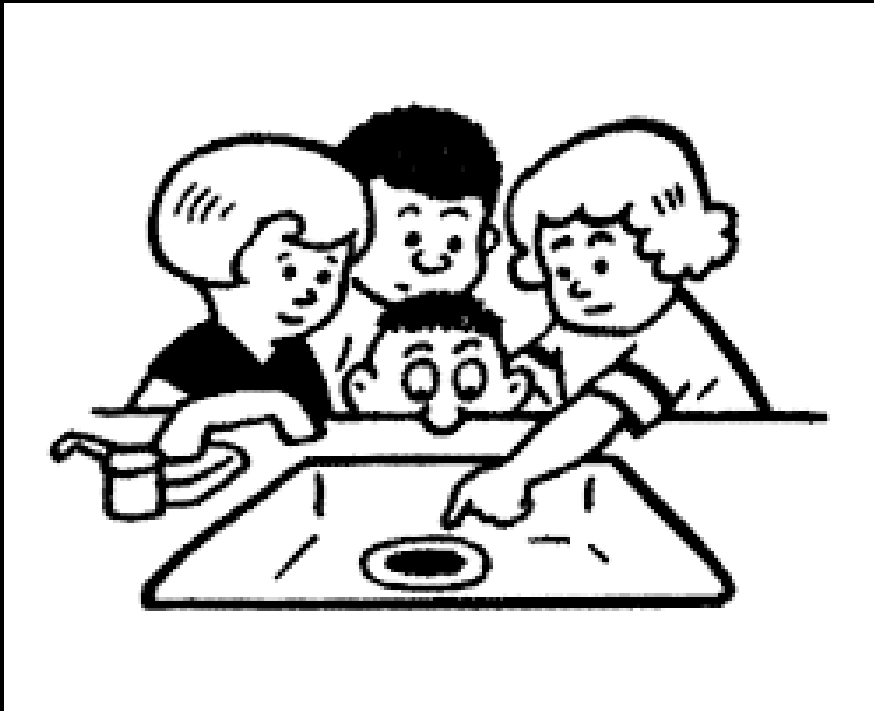
Lowering IOP

- Eye drops
- Laser
- Incisional surgery

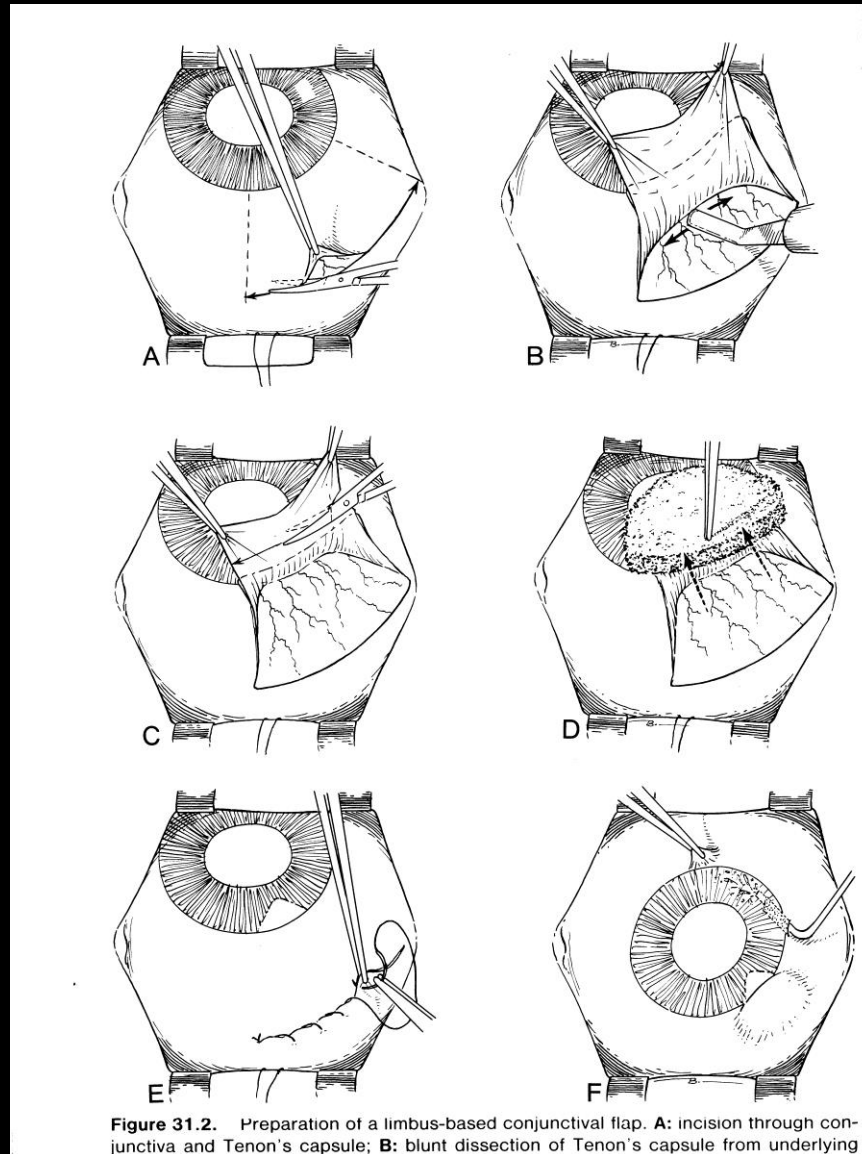
Precision Glaucoma Surgery

Matching the patient and the procedure

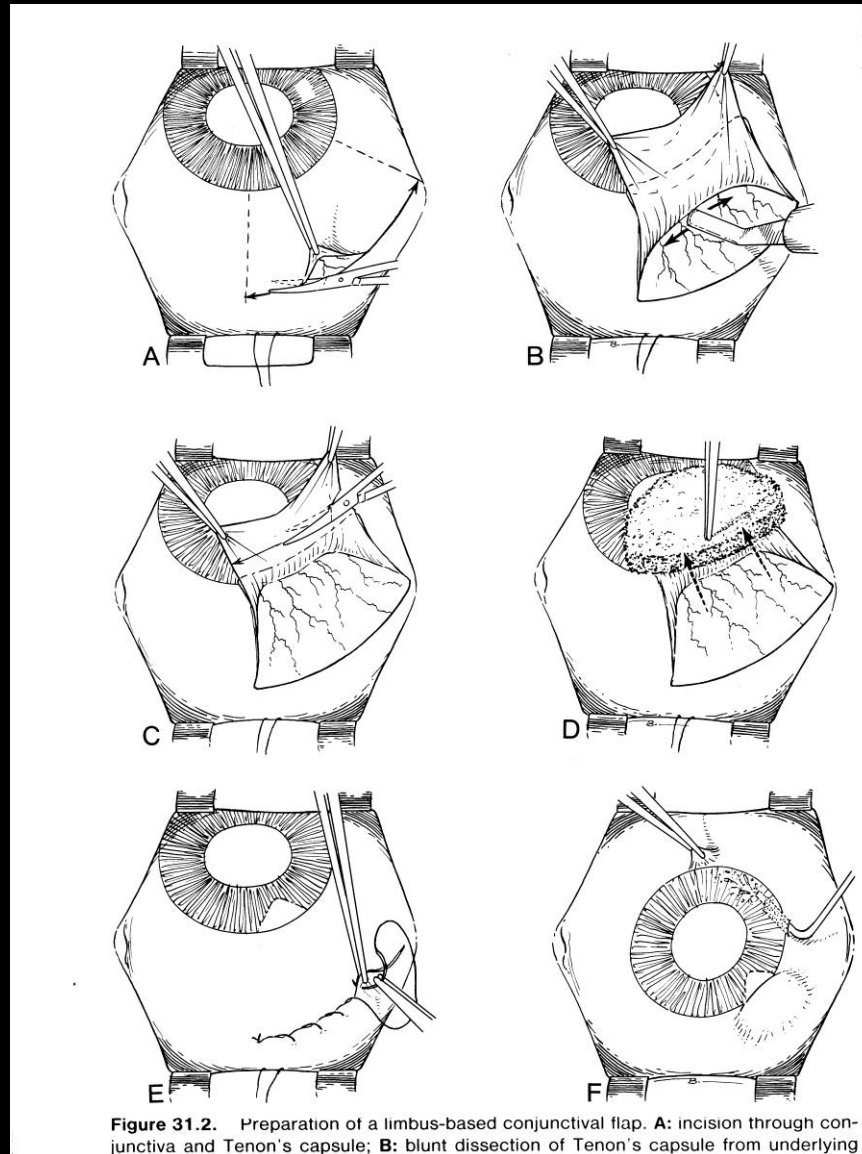
Glaucoma surgery



Trabeculectomy 1982



Trabeculectomy 2018



Trabeculectomy

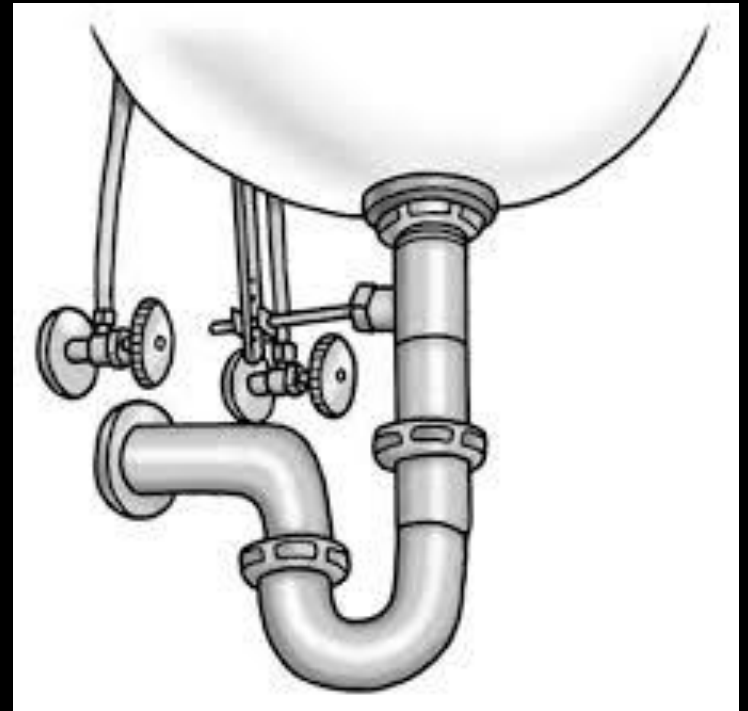
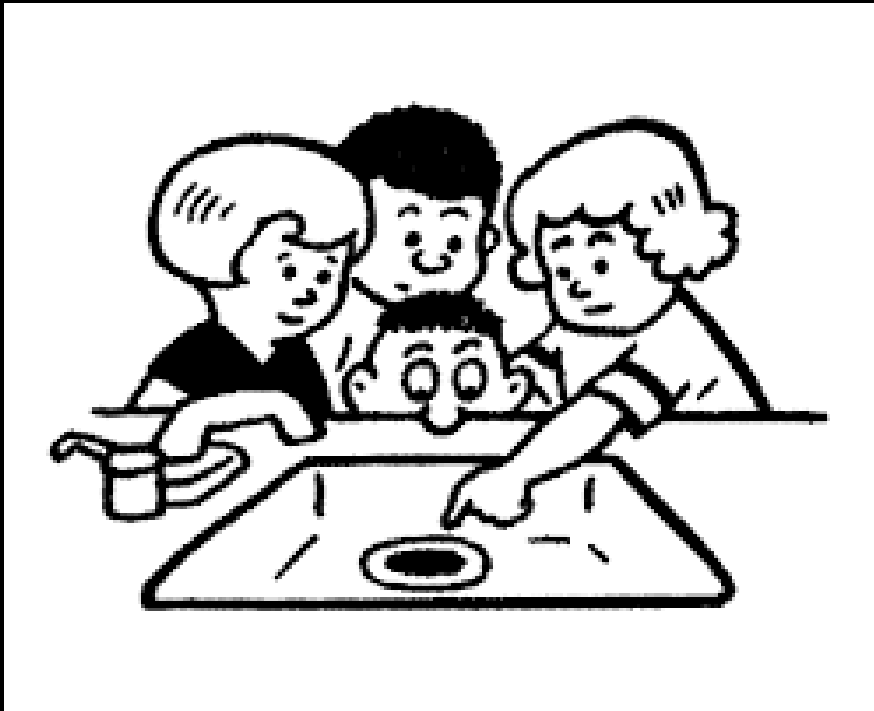
- Standard of filtration surgery for nearly 40 years
- Modifications have improved technique
- Most effective IOP-lowering operation
- Unpredictable complications and results

Trabeculectomy

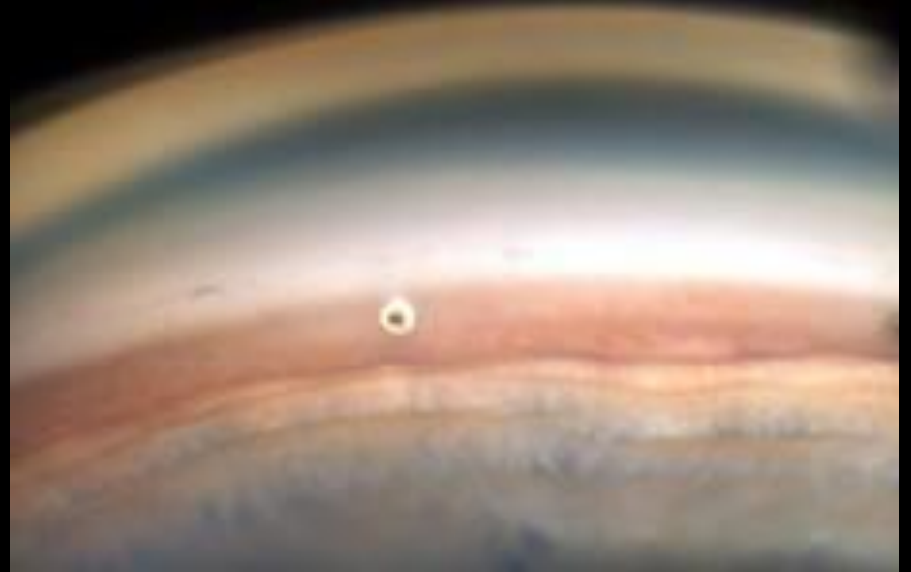
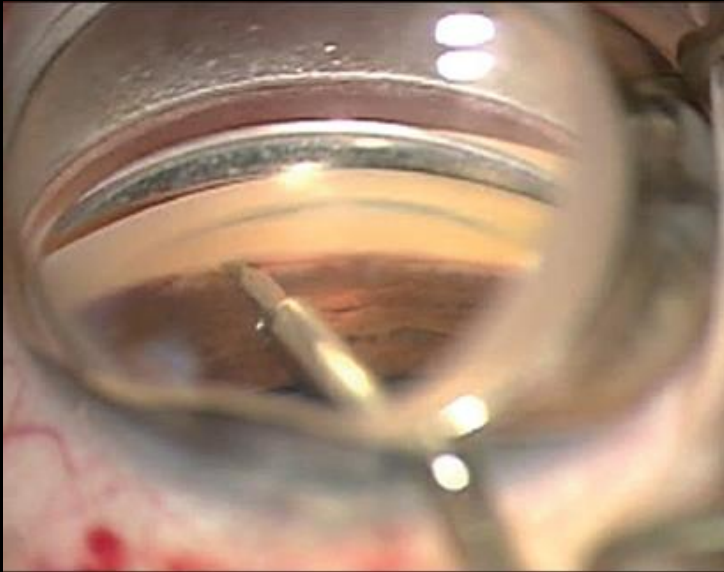
- Most effective IOP-lowering operation
- Unpredictable results
- “It’s complicated”

Minimally invasive glaucoma surgery

Glaucoma surgery



iStent



Thank you