Dr Rod Keillor

Ophthalmologist

Dunedin

Glaucoma - Concurrent Workshop Repeated

Friday, 16 August 2013	Start 4:30pm	Duration: 55mins	Kremlin
	Start 5:35pm	Duration: 55mins	Kremlin

Which would you consider the most devastating event?

- " To not be able to walk"
- " To not be able to write"
- " Complete deafness"
- " Lose your memory"
- " Live in complete blackness"

Which would you consider the most devastating event?

- " To not be able to walk" 9%
- " To not be able to write" 4%
- " Complete deafness" 12%
- " Lose your memory" 5%
- " Live in complete blackness" 70%

Glaucoma is a leading cause of preventable blindness in NZ

- It is estimated 50% of people with glaucoma do not realise they have it.
- Early detection is the key to preventing irreversible sight loss.
- 98% of patients who comply with treatment will not go blind

Glaucoma NZ aims to eliminate blindness from glaucoma through:

Providing information and education for glaucoma patients

Promoting awareness of glaucoma

Professional education

Supporting research into glaucoma in NZ

Glaucoma Patients

Where do they come from?

Ben LaHood
Associate Professor Gordon Sanderson
Dunedin Hospital

Background

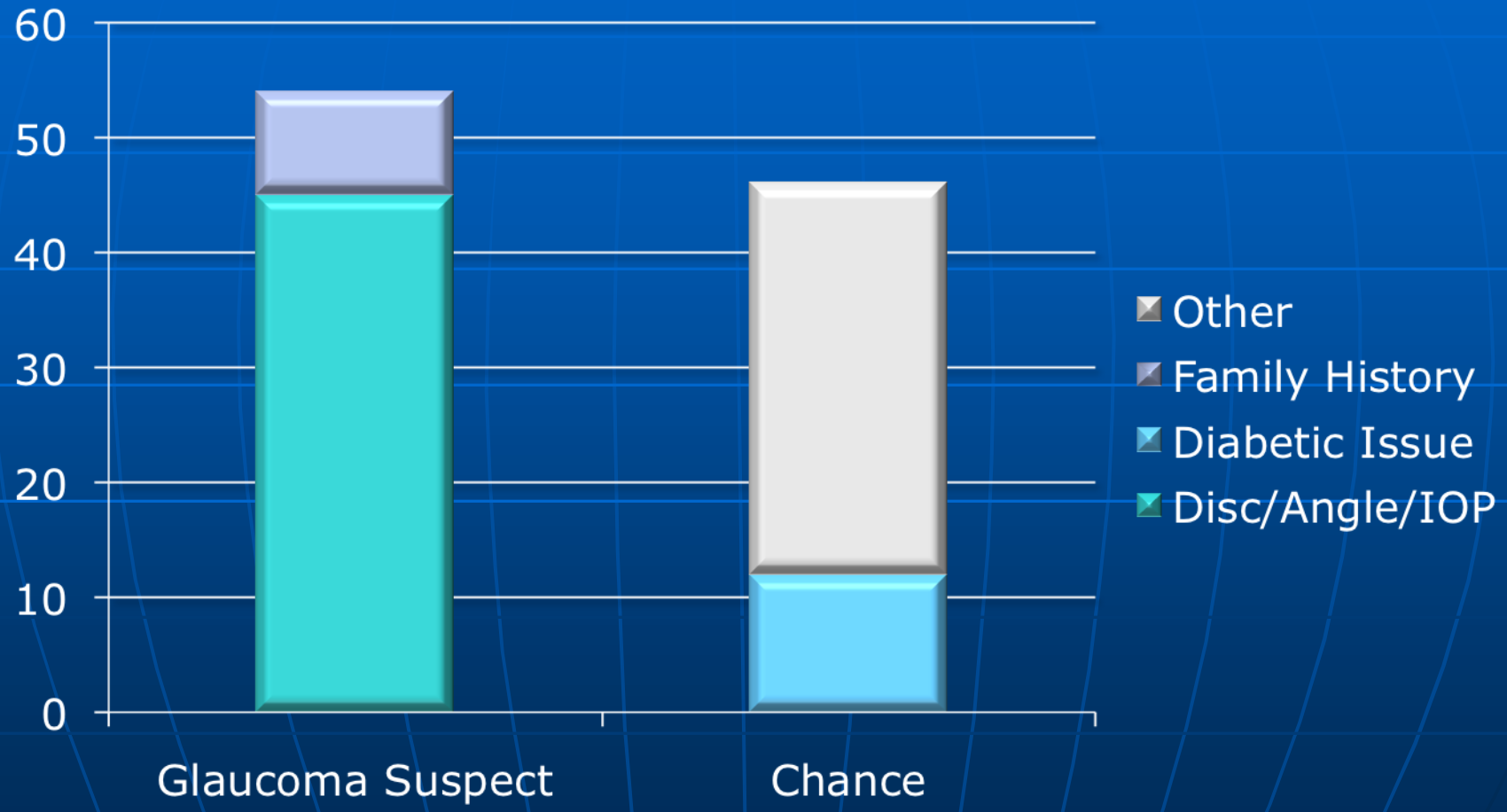
- Glaucoma
  - Leading cause of preventable blindness in NZ
  - Few symptoms until advanced
- 50% of glaucoma undiagnosed
  - Estimated from large population studies
- Little data on patient recruitment

How are patients found?

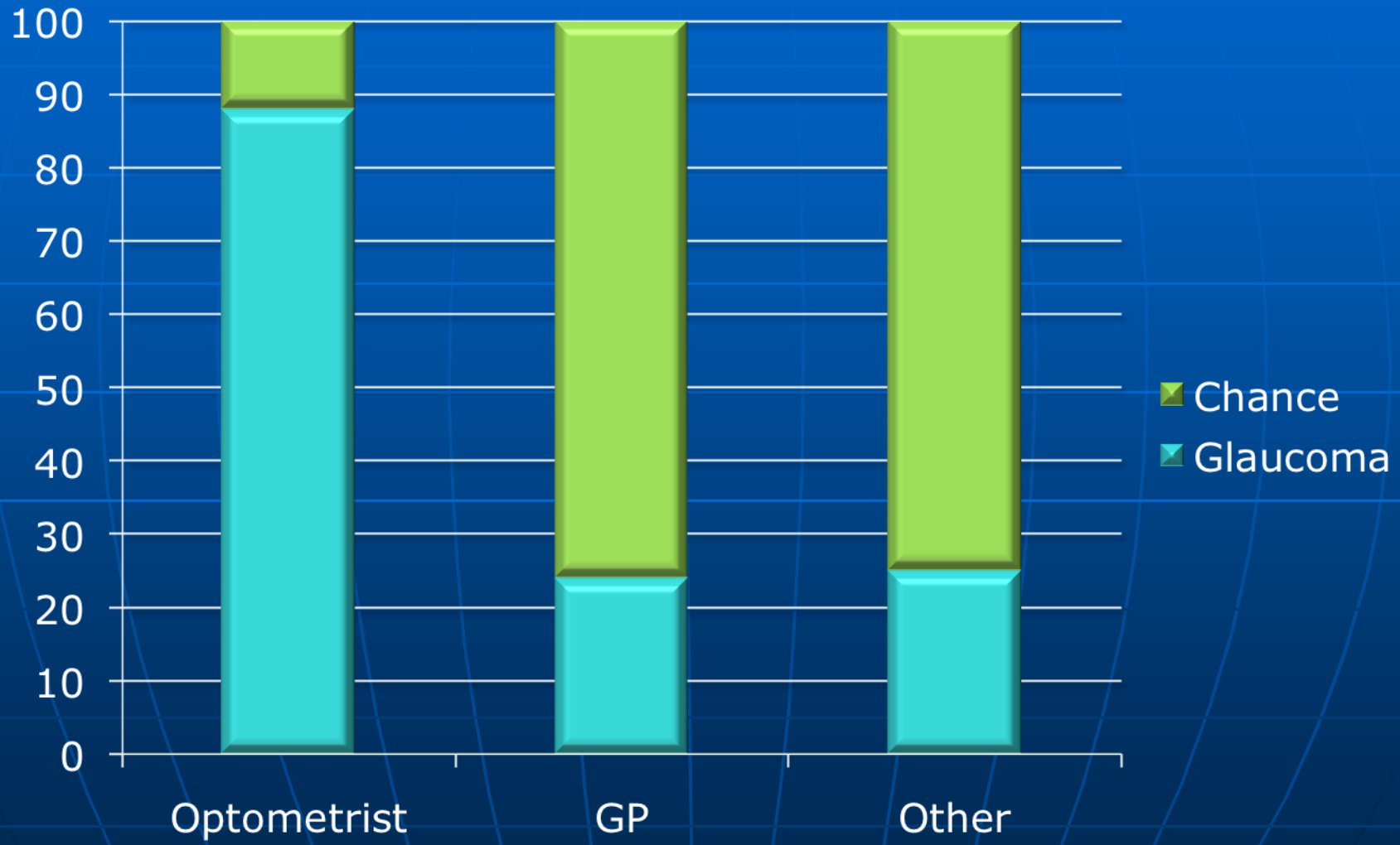
- 100 Glaucoma Clinic patients
- Retrospective Record review

- Aims
  - What prompted initial assessment
  - Variation of referral reason by referee
  - How early is glaucoma detected

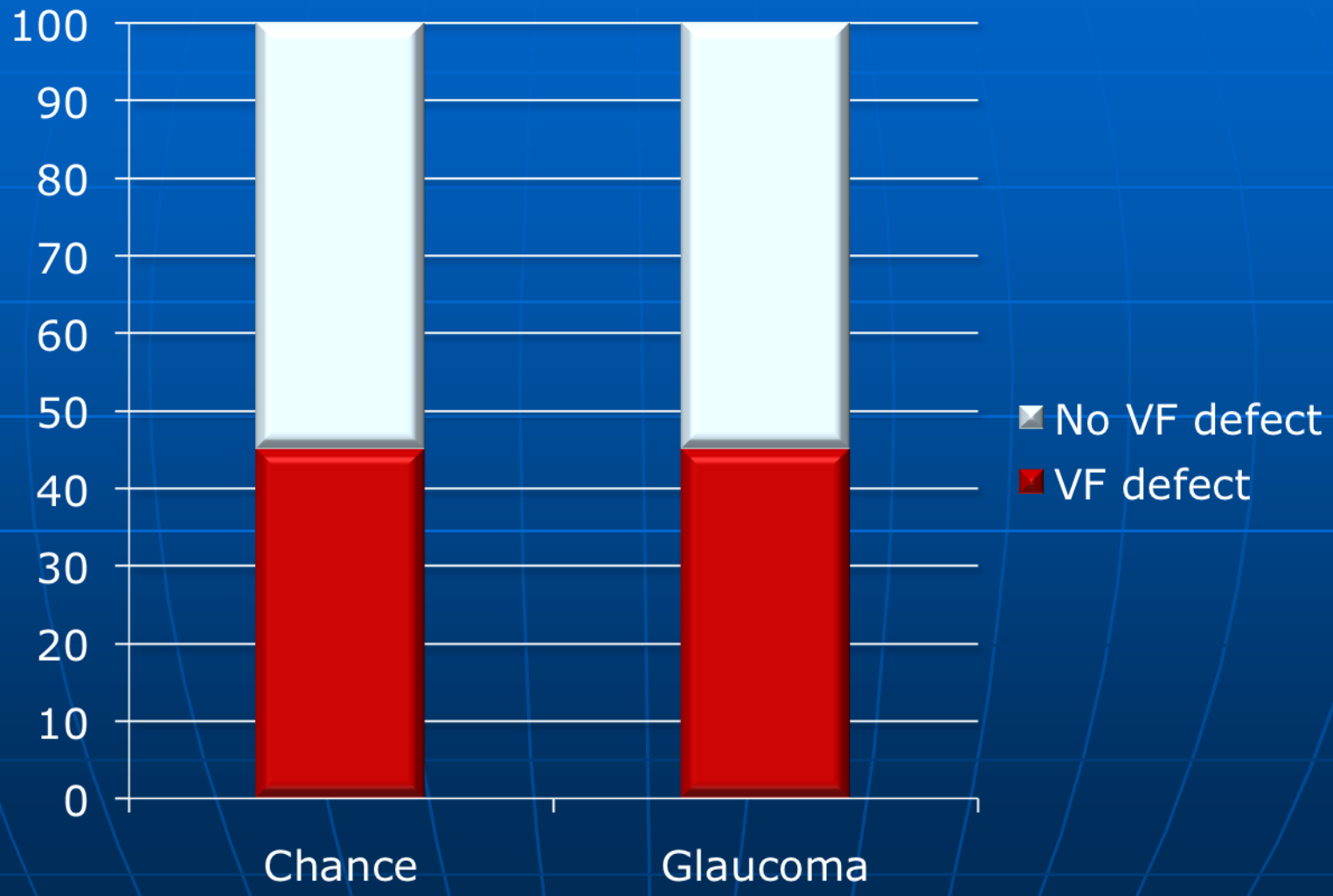
What Prompted Assessment?



Variation by referee



How early is glaucoma detected?



Conclusions

- Half of Glaucoma patients found by chance
- Higher proportion chance finding in GP referrals for other eye problems
- VF defect at presentation in nearly half

update

- **Methods: 500 glaucoma patients were randomly selected from the database of Glaucoma New Zealand (GNZ).**
- **overall response rate was 80%.**
- **80% of patients had no suspicion of glaucoma prior to its diagnosis.**
- **71% of those who presented with a suspicion of glaucoma (13% of total sample) did so due to a positive family history.**
- **47% of patients were aware of a positive family history of glaucoma.**

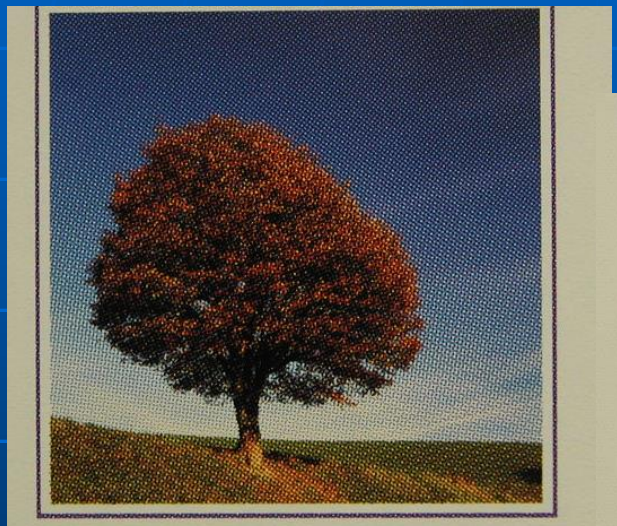
- **A positive family history is the most commonly recognised risk factor prompting examination, knowledge about which appears to increase dramatically post diagnosis..**

Making the diagnosis better than Chance

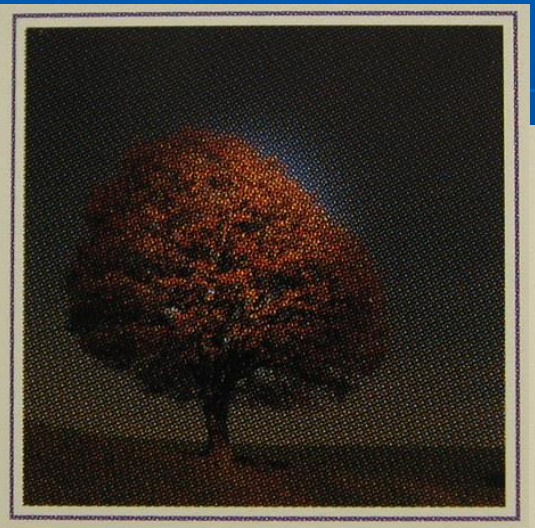
What this means

- Re-enforces
  - Symptomless blinding disease
  - Easily overlooked
- Increased awareness needed
  - GP risk factor review
  - Early and Regular eye examination

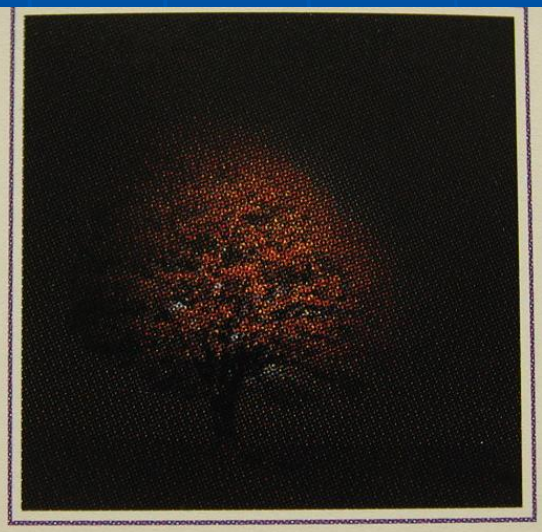
Glaucoma damages the peripheral vision



Normal vision



Moderate glaucor



Severe glaucoma

Glaucoma is a silent disease


A
Hoste AM - Safran AB, 2002


B
: fixation point
Hoste AM - Safran AB, 2002

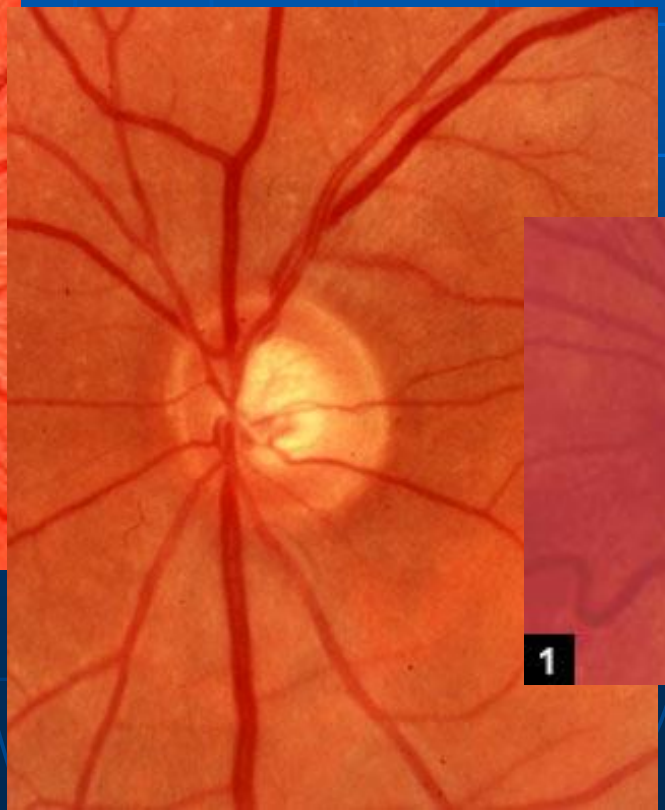

A
Hoste AM - Safran AB, 2002

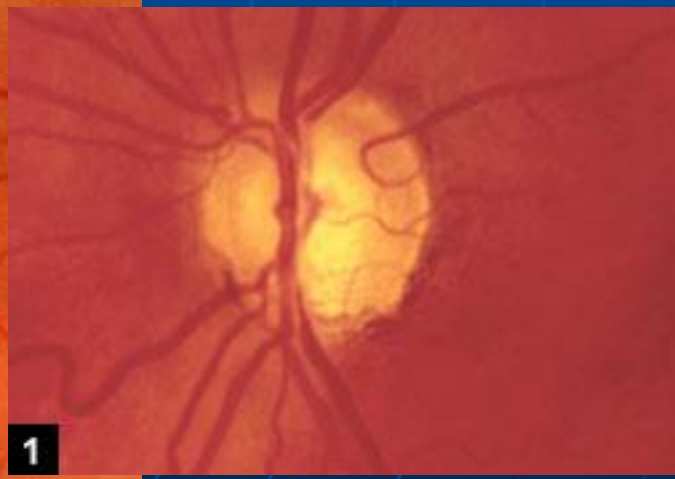

C
: fixation point
Hoste AM - Safran AB, 2002

Glaucoma: An optic atrophy–

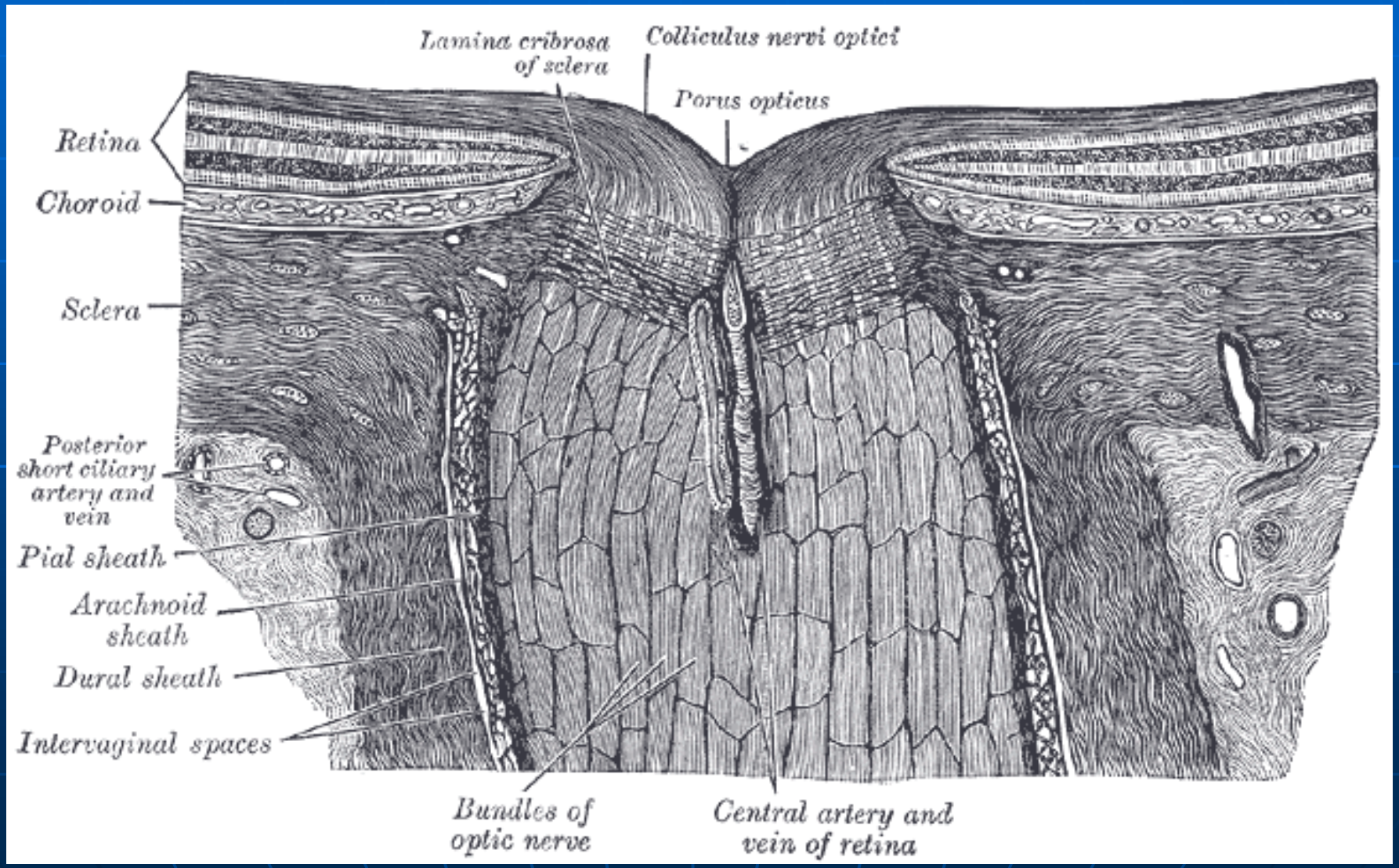
Many types of Glaucoma

The common factor is glaucomatous optic atrophy



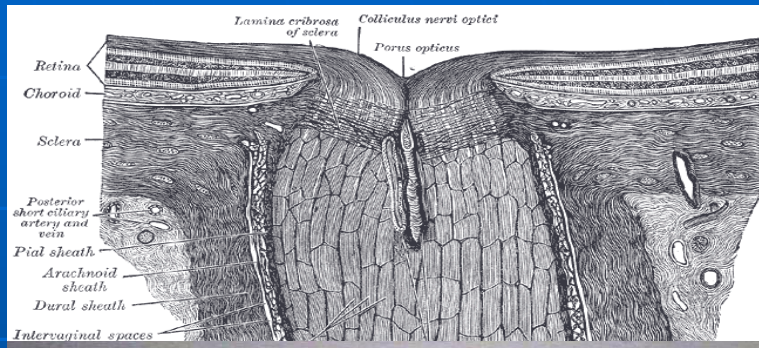


Optic nerve

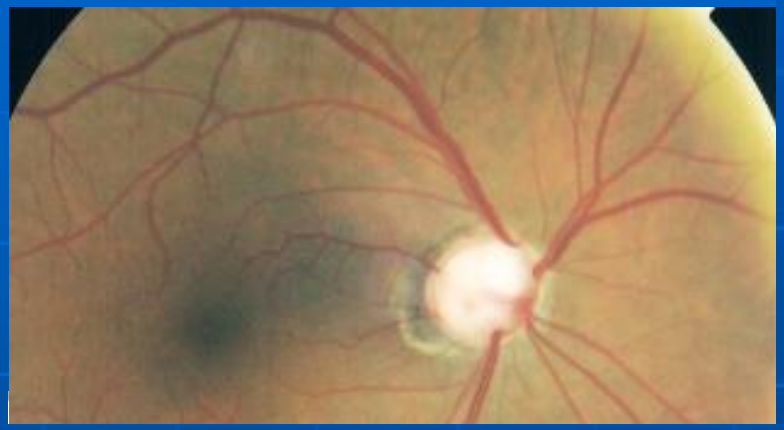

Lamina cribrosa of sclera
Colliculus nervi optici
Porus opticus
Retina
Choroid
Sclera
Posterior short ciliary artery and vein
Pial sheath
Arachnoid sheath
Dural sheath
Intervaginal spaces
Bundles of optic nerve
Central artery and vein of retina

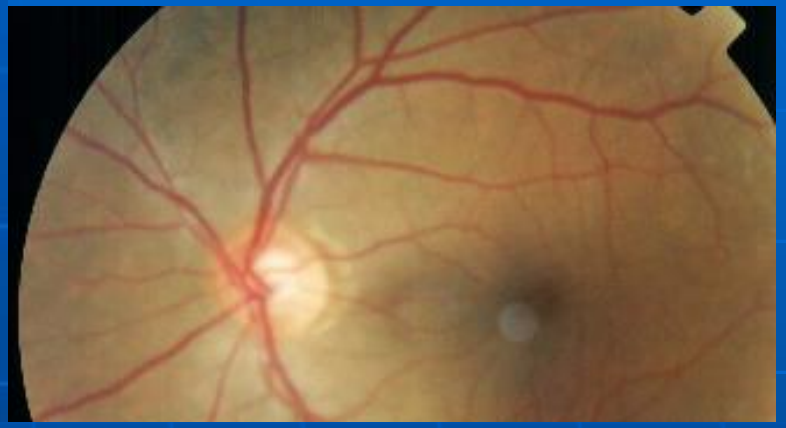
Features of Glaucomatous optic atrophy

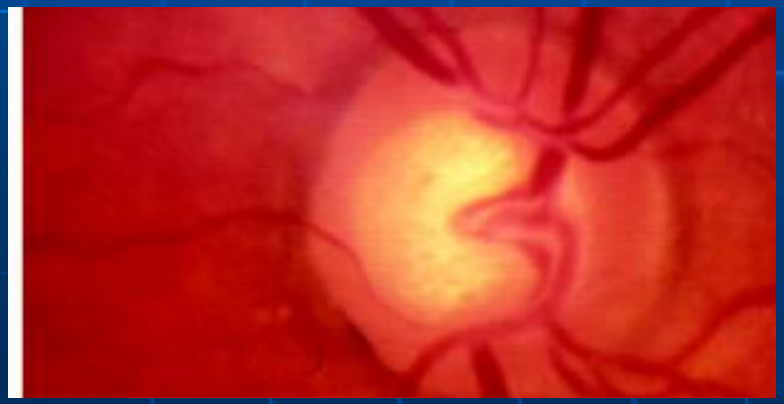
- Cupping
- Vertical ovality
- Notching
- Disc hemorrhage
- Peripapillary atrophy
- Changes with time

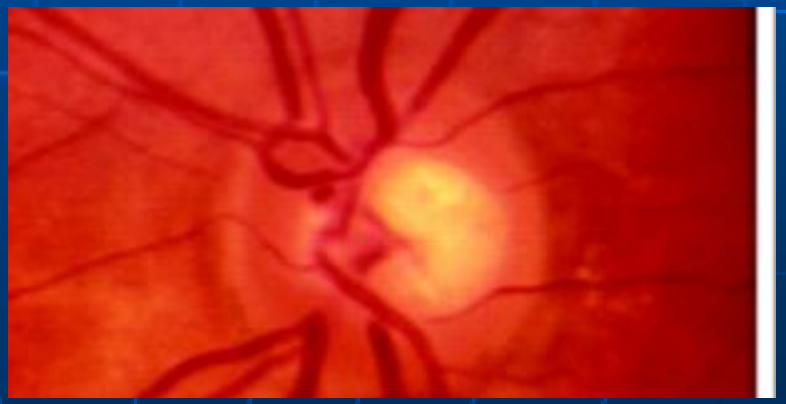


Advanced Glaucoma in the Right Eye



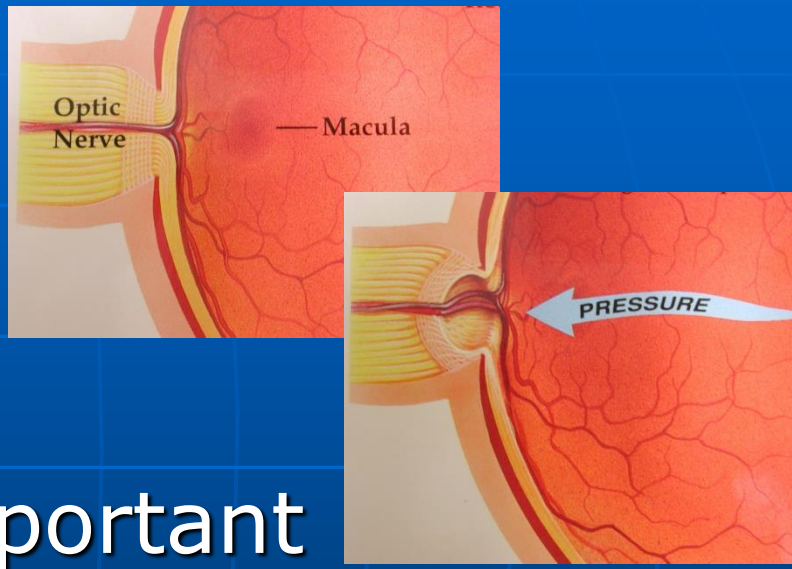






Raised eye pressure

- main risk factor
- not always present
- Perfusion Pressure important



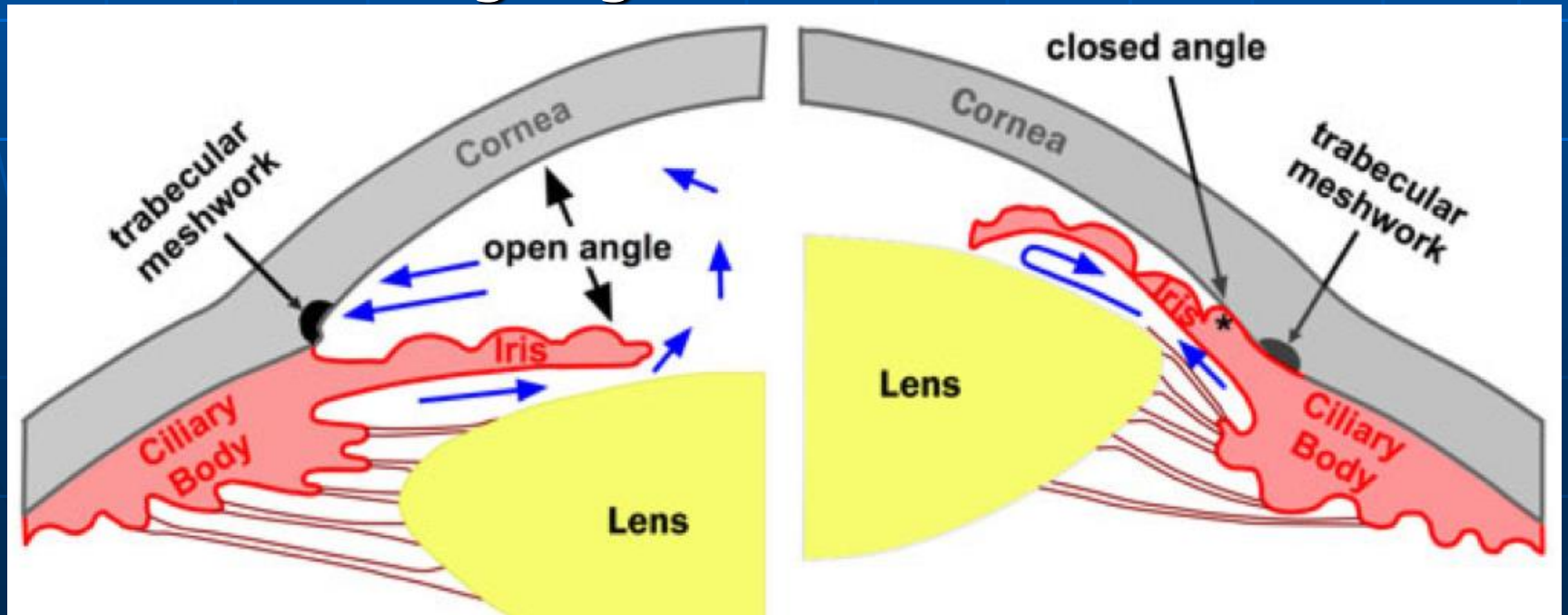
Lowering the eye pressure will prevent further loss of vision - in most cases

Types of glaucoma

Types of glaucoma

Glaucoma is divided into two broad categories:

- Open angle glaucoma
- Closed angle glaucoma



The vast majority of people have a ***chronic open angle glaucoma***

Classification

1. Open angle
   - With elevated IOP ocHT
   - Normal tension
2. Closed angle
   - acute,
   - Chronic
3. Secondary

Local;

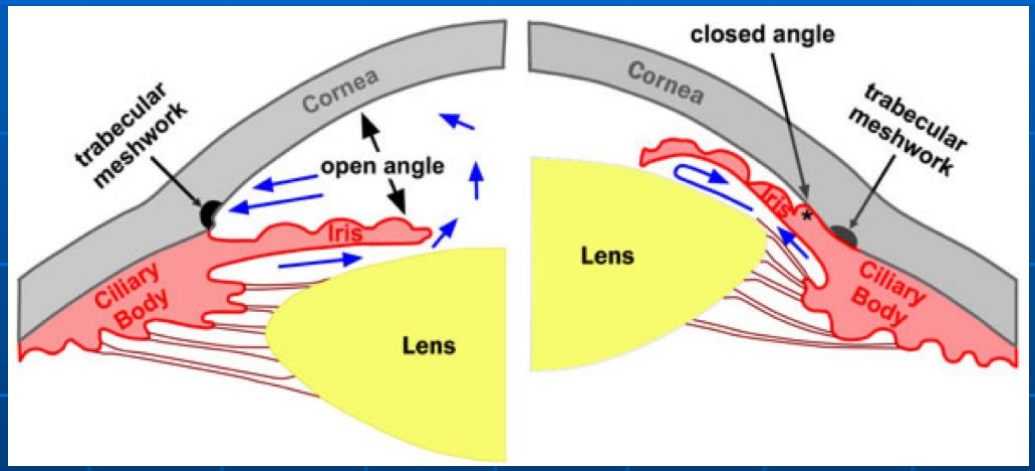
Psudoexfoliation

mechanical

Inflammatory

Systemic

steroid



Risk factors for open angle glaucoma

Risk Factors

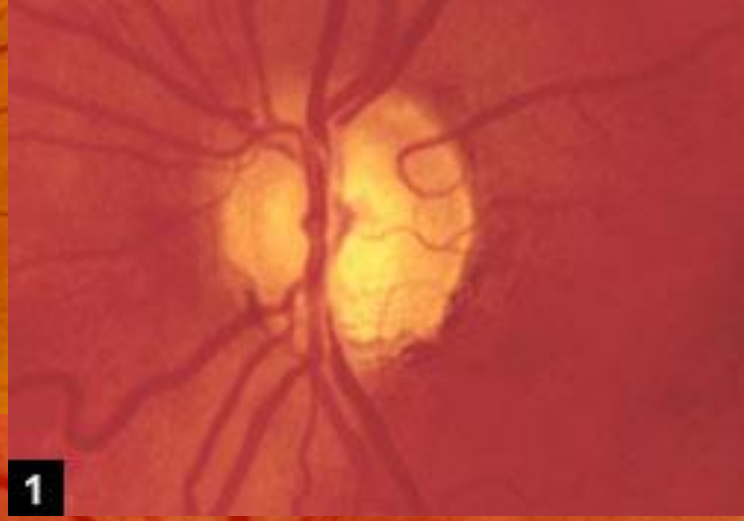
- age>60 6x
- Family history 4-9x

- **Diabetes 2x**
- African American 3 x
- Myopia (short sightedness)
- Steroid medication
- Migraine sufferers
- blood pressure – High/ Low
- Smoking
- Cholesterol

Diagnosis

- Optic Disc appearance
- Family History
- IOP

- Fields
- OCT
- Time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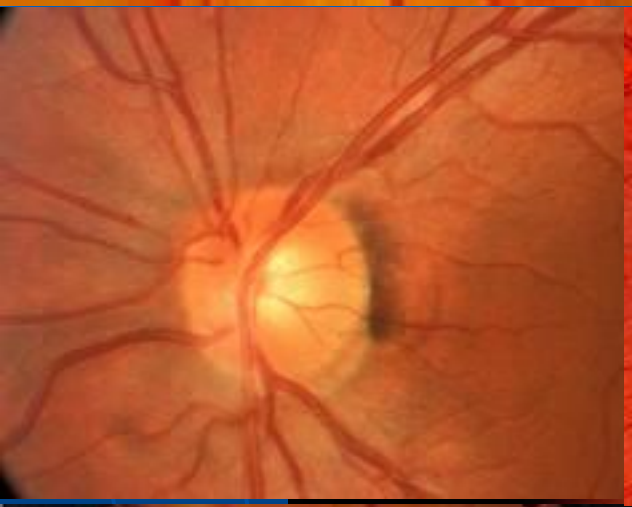
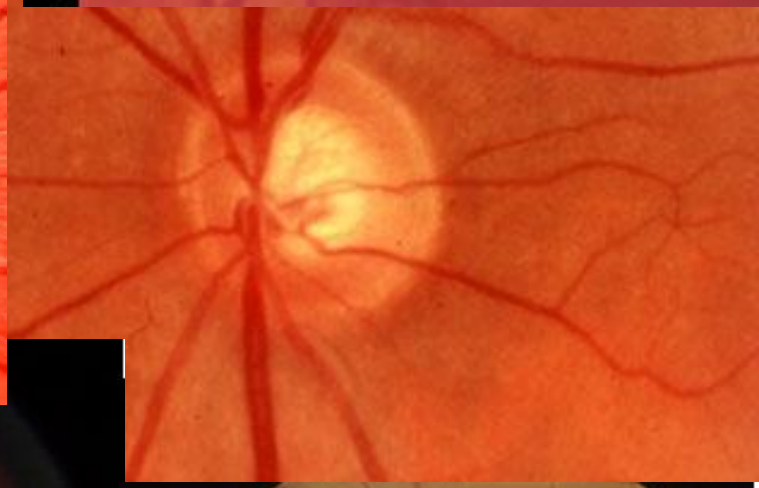
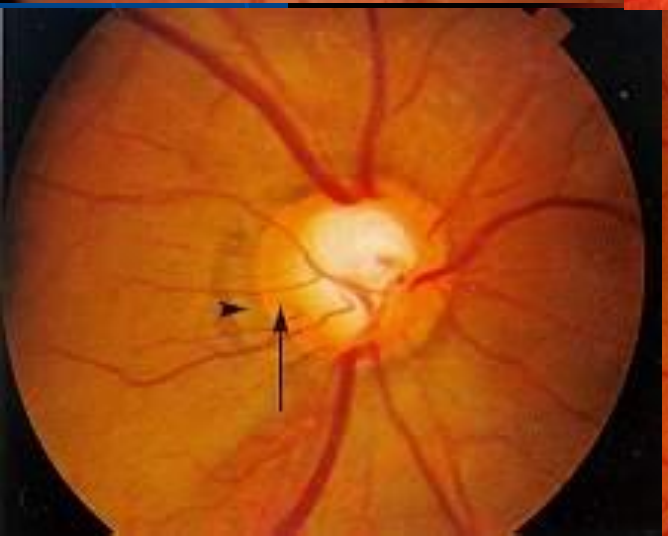
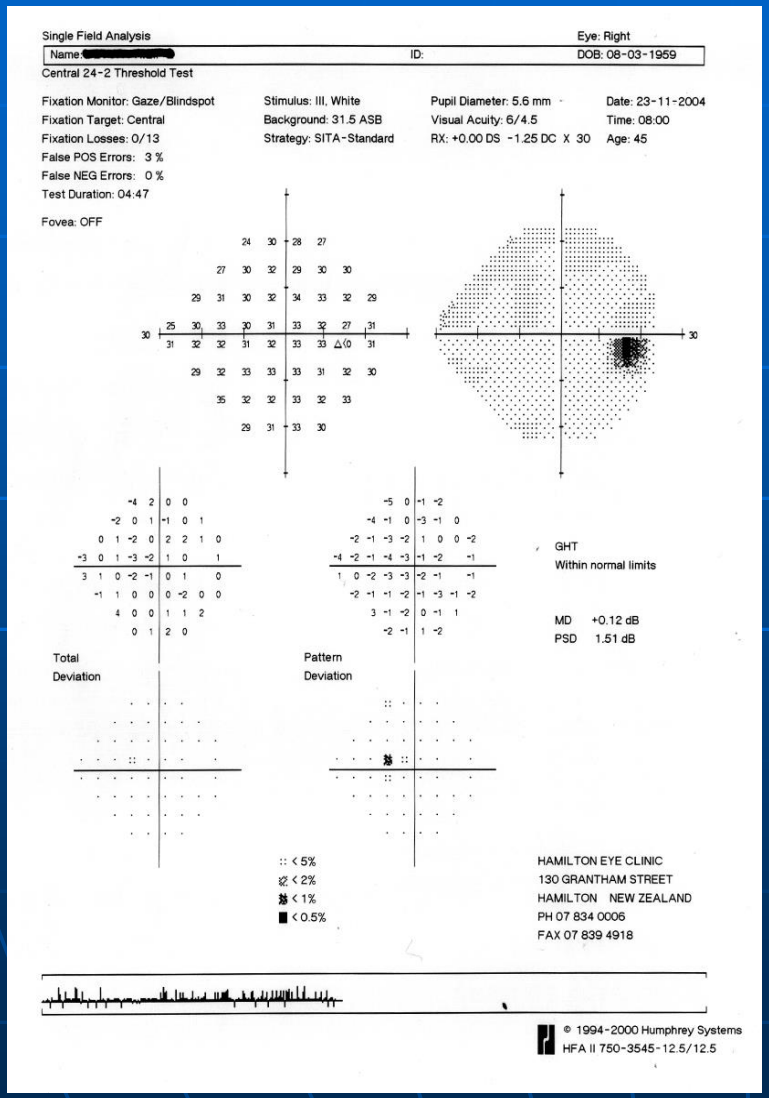
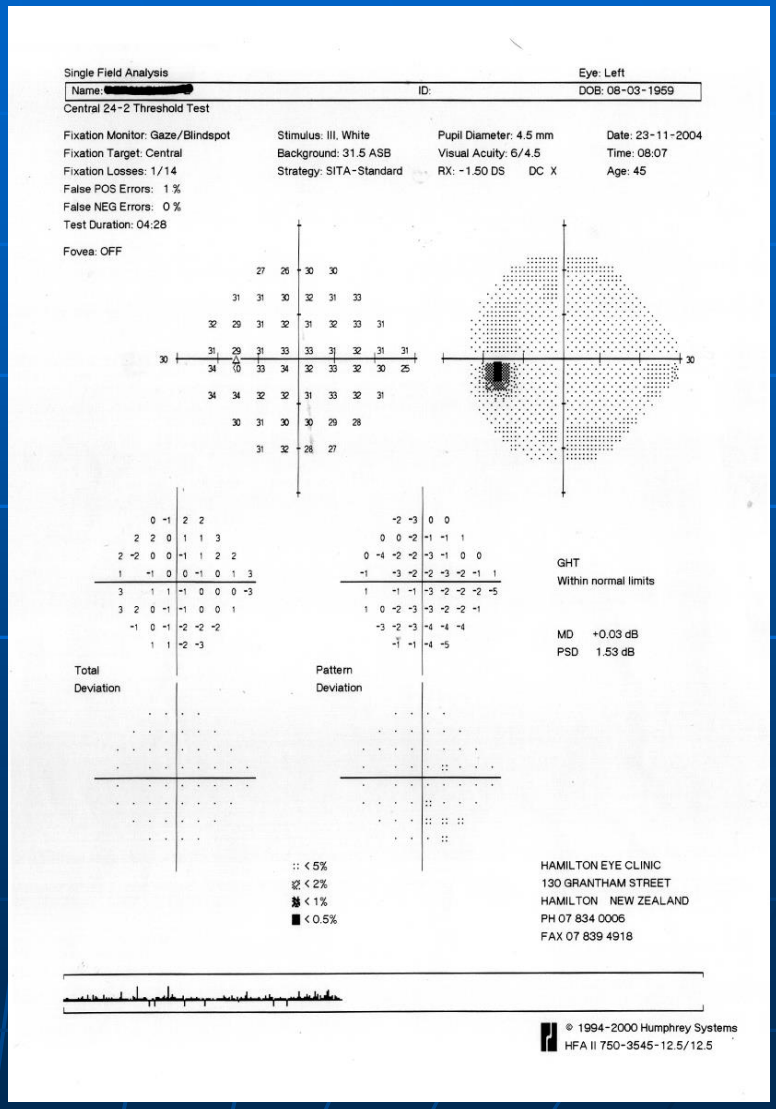




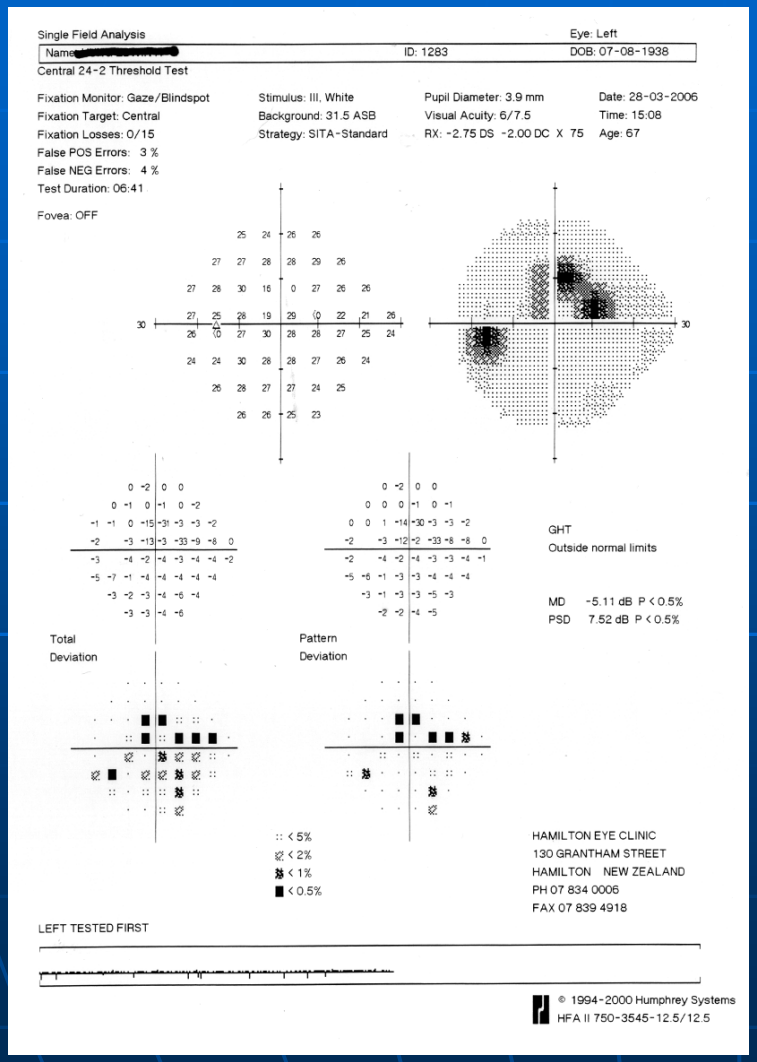


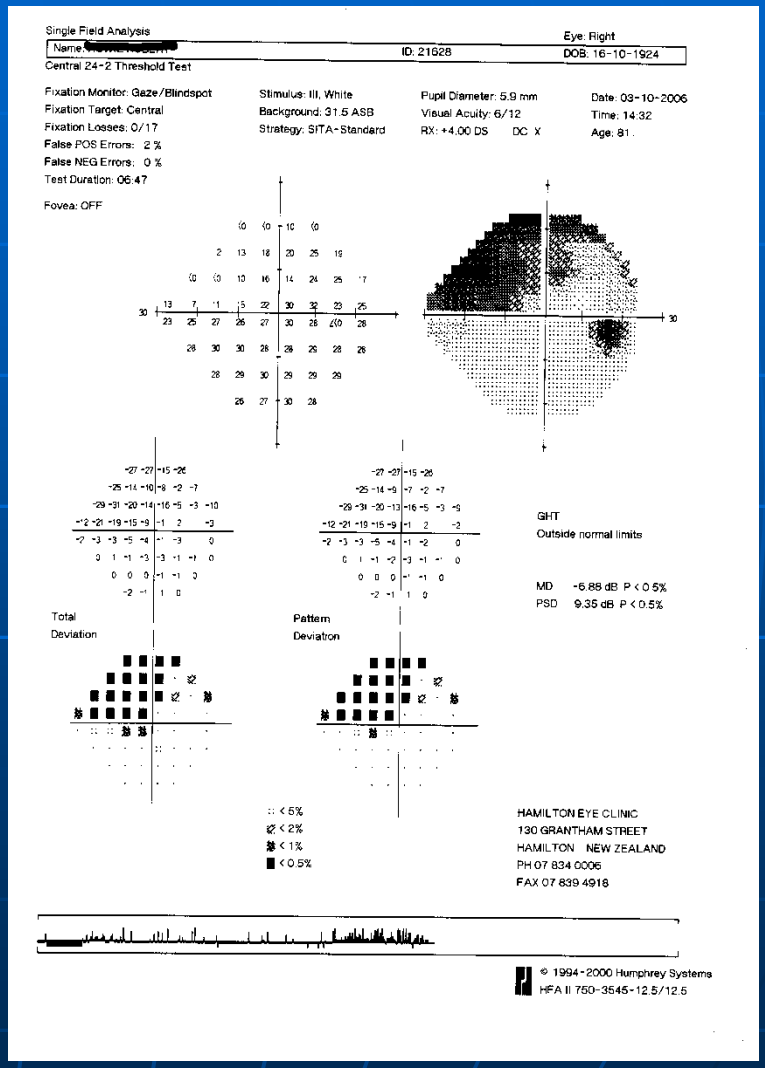
Normal visual field test



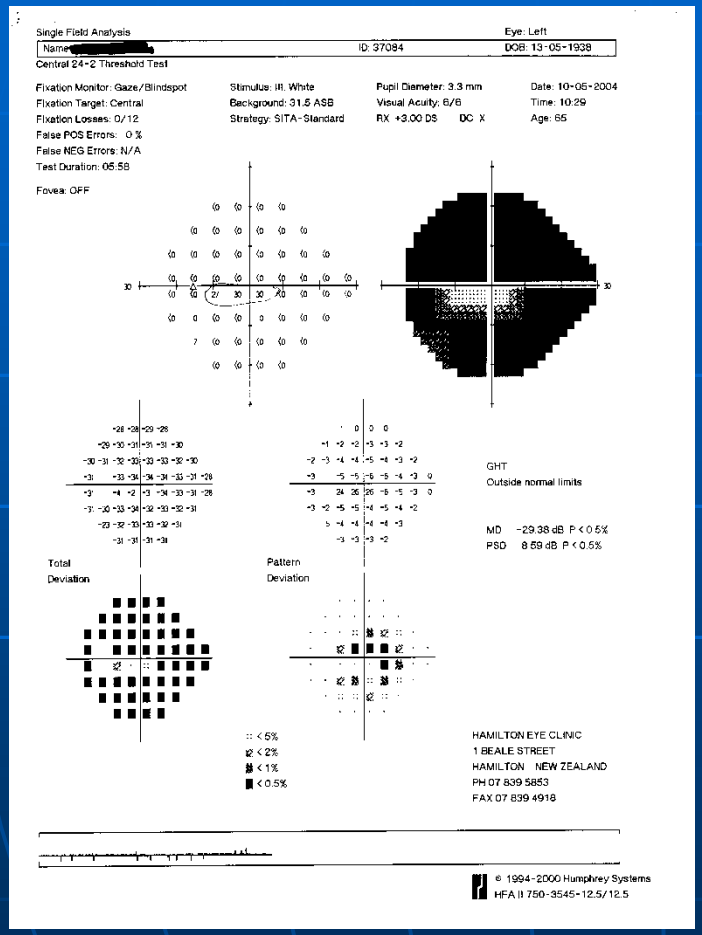


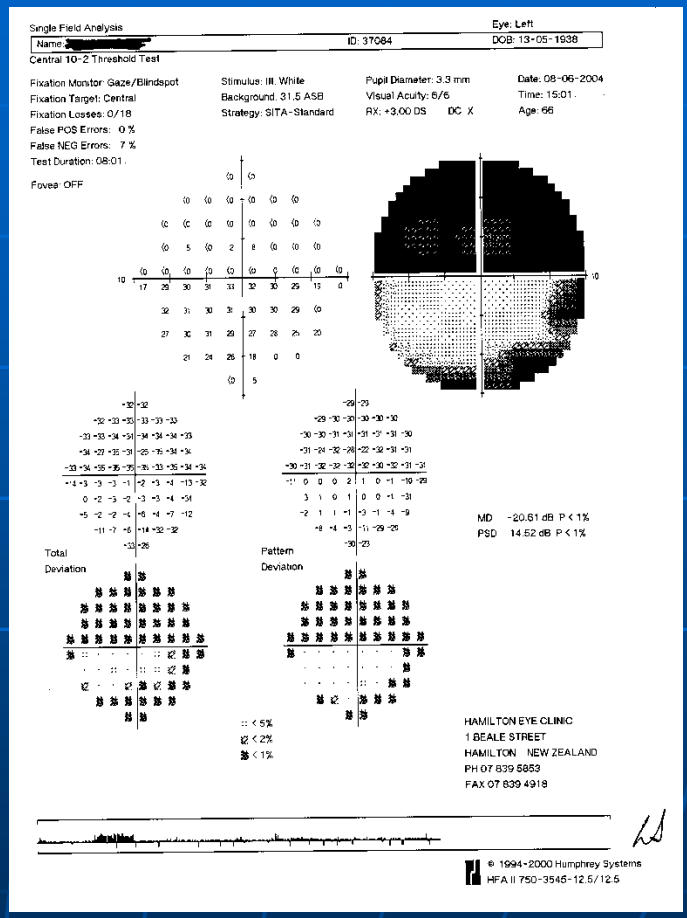
Early field loss





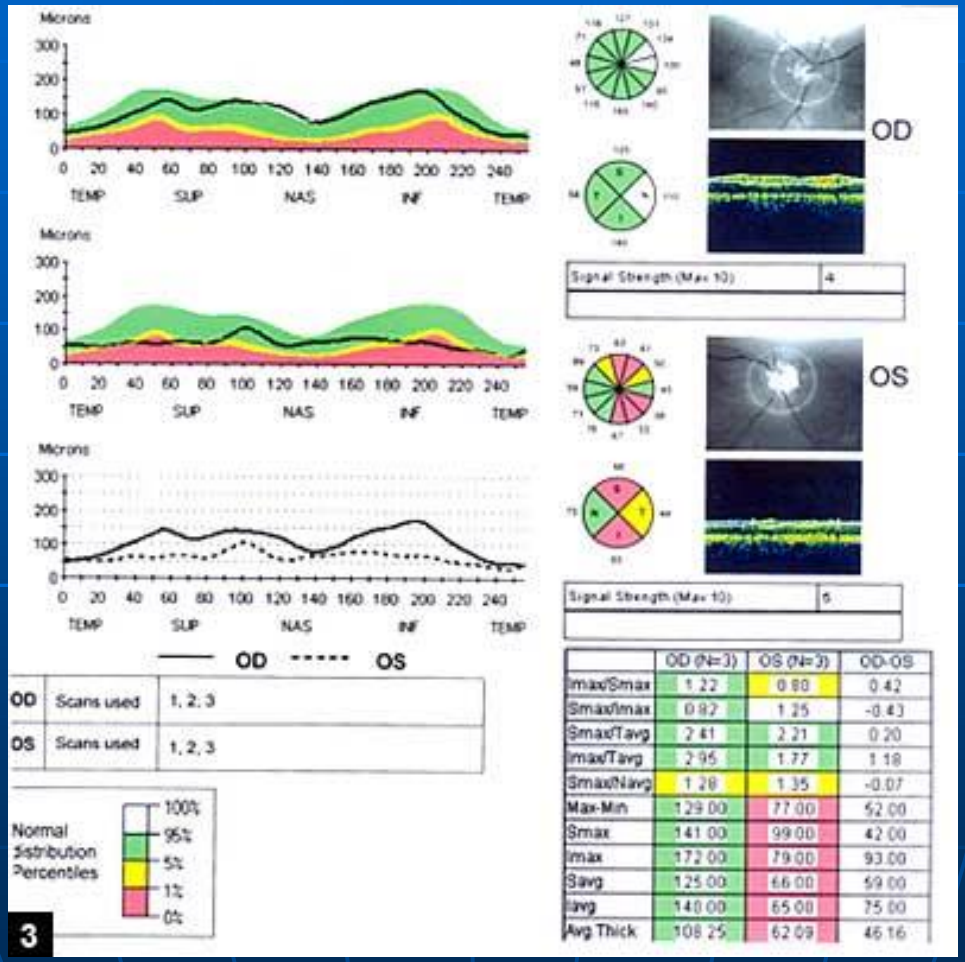
Advanced field loss





- Left eye fields – standard, and central “10-2”

Ocular coherence tomography



Glaucoma: the silent loss of Sight

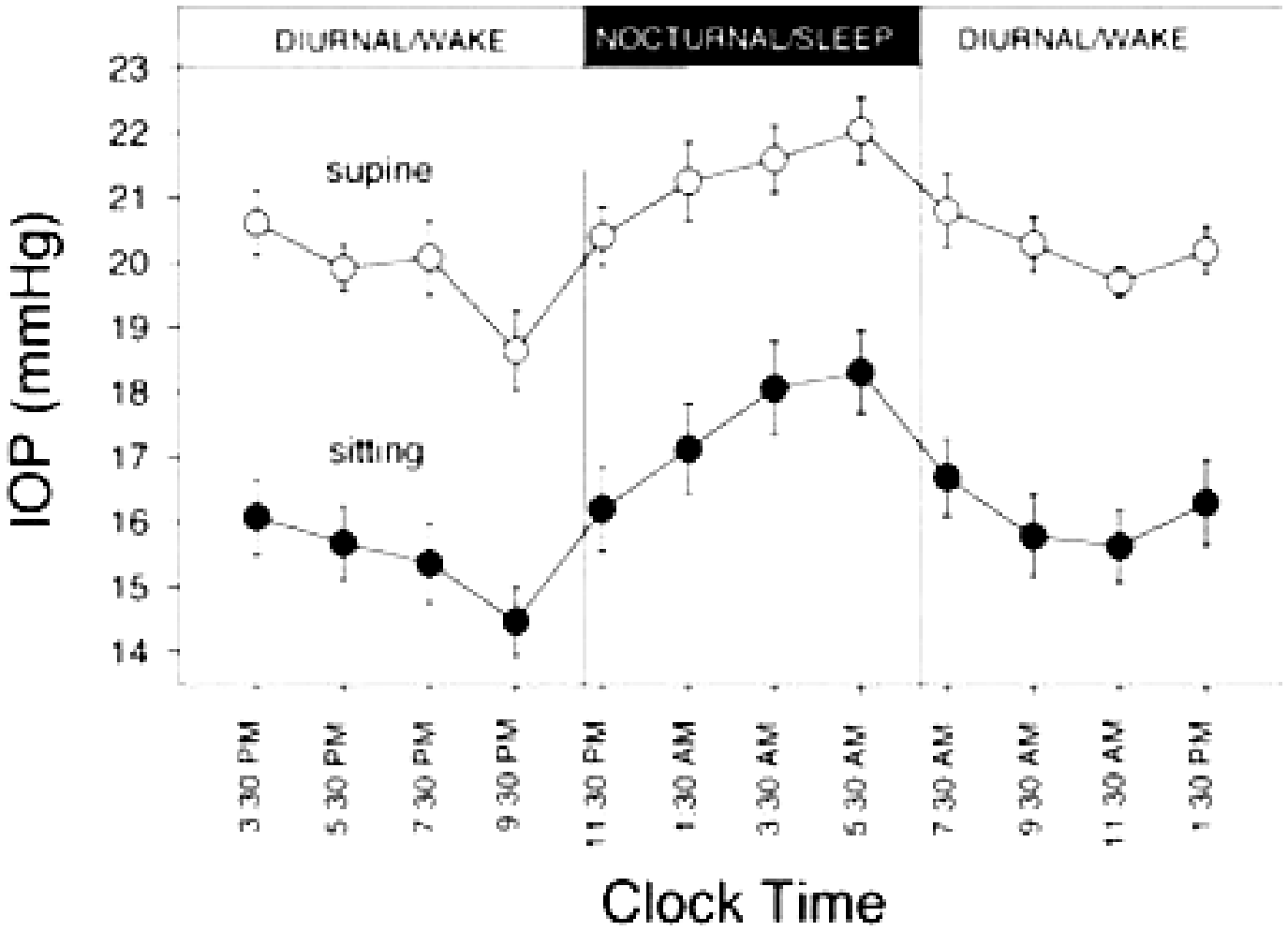
- One of the most typical characteristics of glaucoma is that patients only notice loss of vision late in the disease
- This is one of the major reasons people still go blind from glaucoma

How do we treat glaucoma?

At present, the only way we can treat chronic glaucoma is by lowering the eye pressure

IOP monitoring

Peak IOP Occurs at Night[19]



Visual field loss related to iop and time

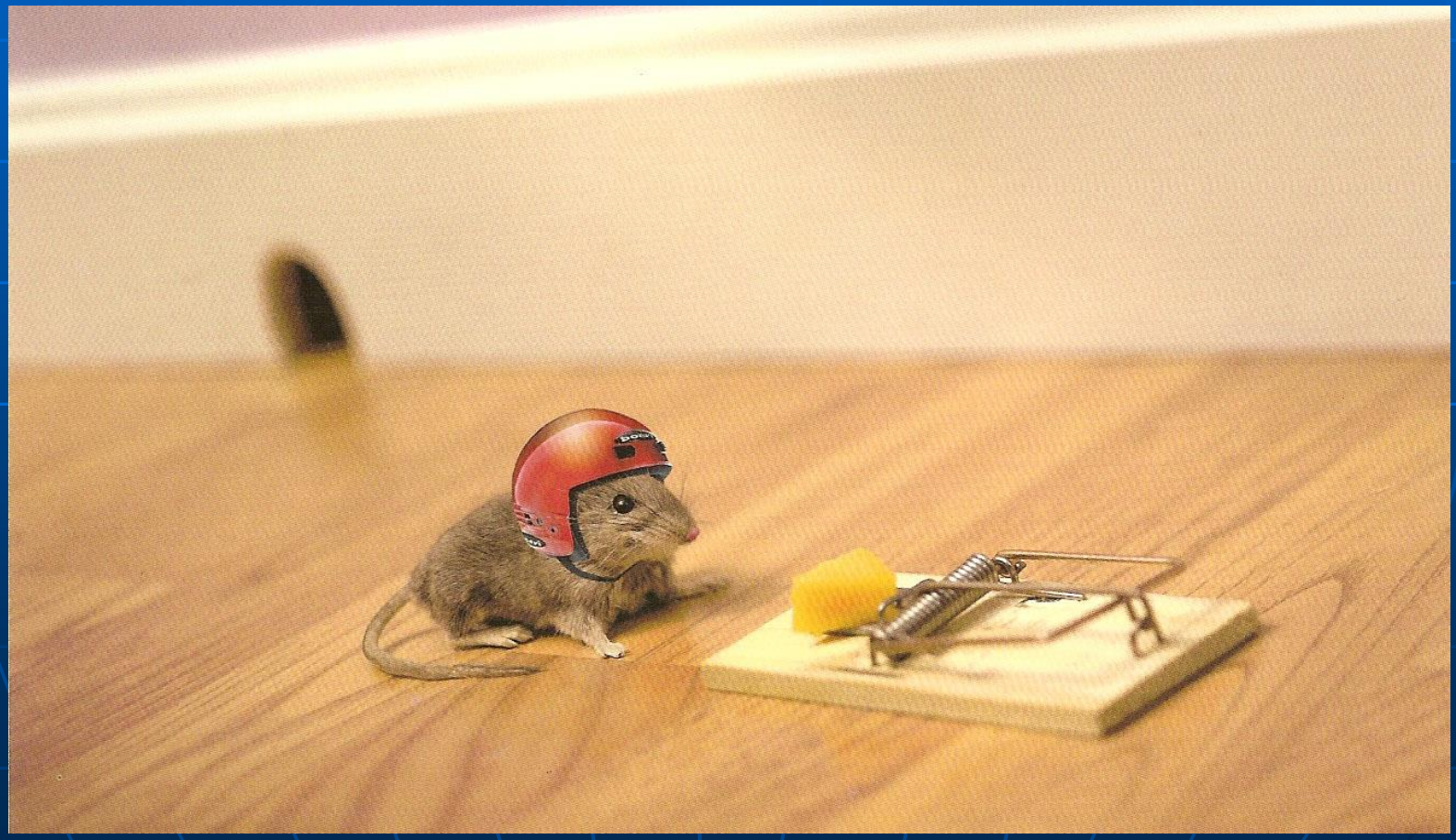
- IOP 30mmHg: 20% loose field in 5 years

- Normal attrition
- ‘safe’ ‘acceptable’ loss

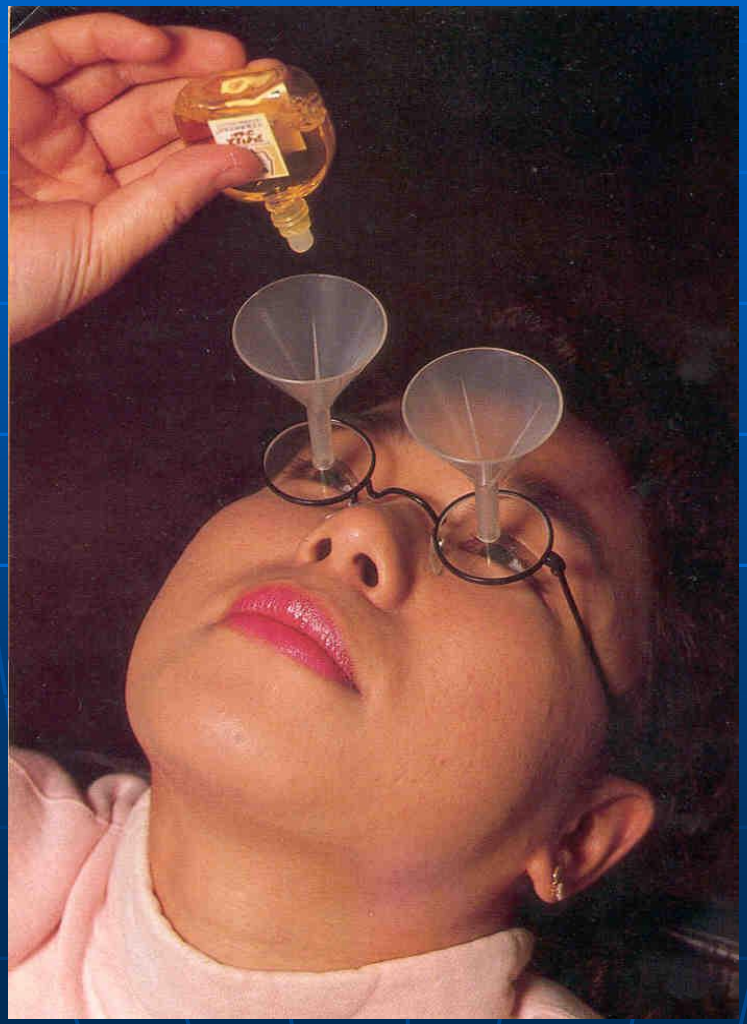
Lowering IOP

- Medical therapy
  - Prostaglandins
  - Betablockers
  - Brimonidine
  - Acetazolamide
- Laser therapy
- Surgery
  - Trabeculectomy
  - Tube

Medications to reduce IOP- must get into the eye to work!



Most common treatment is eye drops




PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
TRAVATAN
0.004%
Travoprost Eye Drops
PRESCRIPTION MEDICINE
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
Alphagan
(brimonidine tartrate 2 mg per mL)
EYE DROPS
AUST R 60297
STERILE
5 mL
ALLERGAN
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
AZO
1.0%
Brinzolamide 10
Eye Drop
5 mL
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
LUMIGAN
Bimatoprost eye drops
300 µg/mL
AUST R 80657
STERILE
3 mL
ALLERGAN
APOTEX
0.5%
5 mL
Azopt 1.0%
Brinzolamide 10 mg/mL
Eye Drops
04/2008

Prostaglandins
Xalatan, Travatan, Lumagan

- Red Eye (less in 2 months)
- Darker Iris
- Longer Eyelashes
- Min/no systemic SE

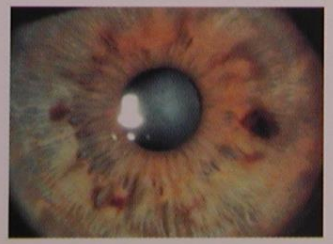
Baseline

After 9 months of latanoprost treatment

Baseline

After 10 months of latanoprost treatment

Baseline

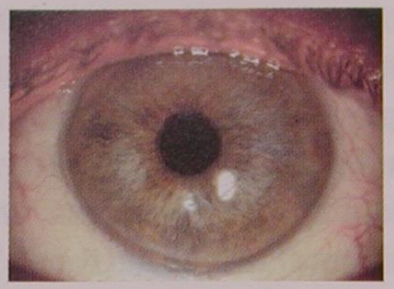


After 12 months of latanoprost treatment

Published courtesy of Watson P. Ophthalmology 1996;103:126–137.

Baseline

After 17 months

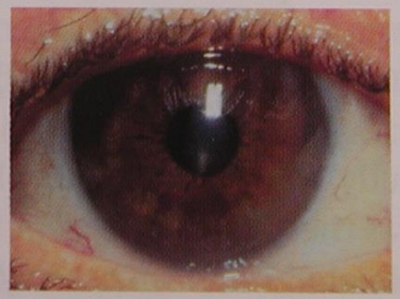


Baseline

After 10 months

Baseline

After 6 months



Published courtesy of Watson et al, Ophthalmology 1996; 103: 126–137.

Beta Blockers

- Asthma
- Lower Blood Pressure
- Slower Pulse
- Dizziness

- Depression
- Vivid Dreams
- Impotence
- Hair Loss

2 Different Strengths of *B* blocker

Timolol XE

Carbonic Anhidrase Inhibitors Trusopt, Asopt, (Cosopt)

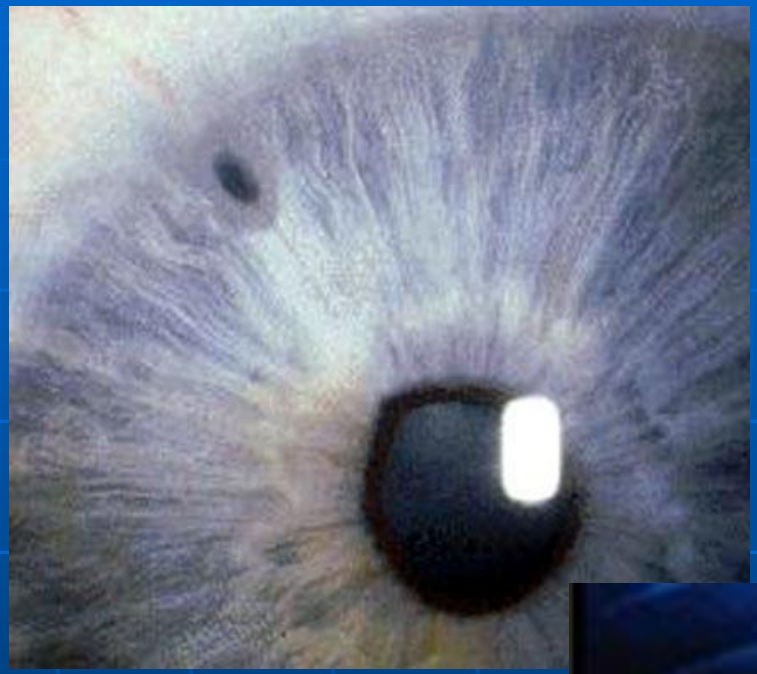
- Bitter Taste
- Stinging
- Crusty eyelashes
- Dry mouth

Alpha Agonists
Alphagan / Brimonidne

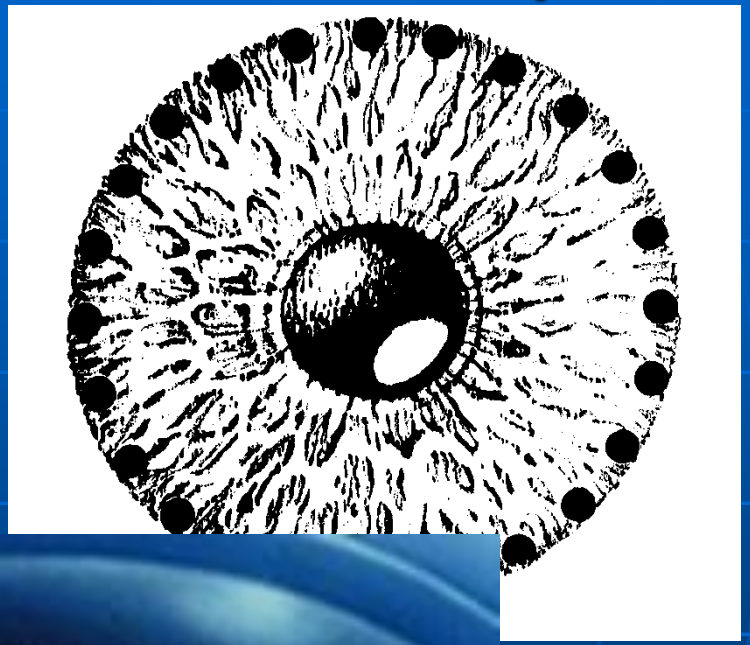
- Allergies
  - 20 – 30%
- Fatigue
- Somnolence
- Higher Blood Pressure
- Dry Mouth
- Altered Taste

Combination Drops

Laser iridotomy



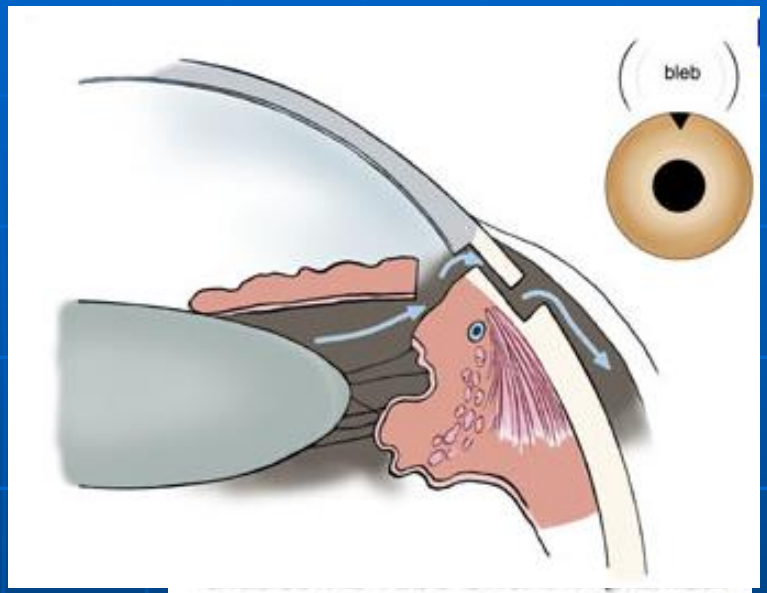
Laser iridoplasty



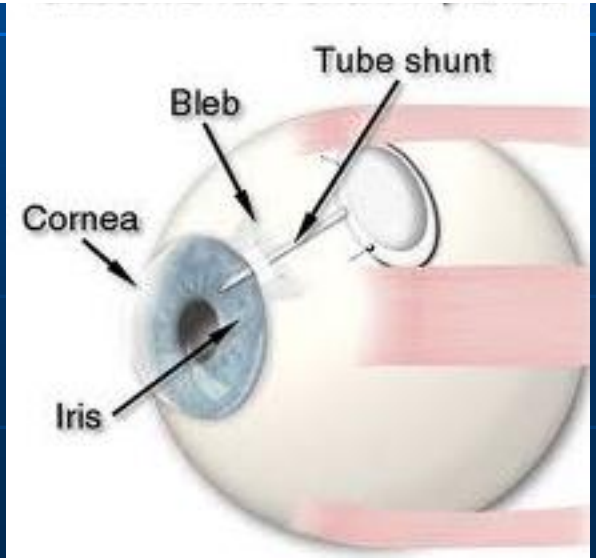
Laser trabeculoplasty

Surgery for glaucoma

- Trabeculectomy



- seatons



Lifestyle and Glaucoma

Use of complementary and alternative medicine for glaucoma

Vitamins therapy	62.9%
Herbal therapy	57.4%
Exercise	24.0%
Diet modification	22.2%
Meditation	1.8%
Acupuncture	1.8%
Faith healing	1.8%

Effect of yoga on IOP

- 10 subjects
- IOP measured sitting and immediately after headstand position
- IOP 14 +/- 2mmHg increased to 32 +/-4 mmHg.

Necktie and IOP

- Increase in IOP after 3 minutes occurred in glaucoma group
- But this increase was followed by a significant decrease in IOP after 15 minutes of tight necktie wear.

Wind instrument and IOP

- Does playing a wind instrument affect glaucoma?

Wind Instrument in IOP

- Increase in IOP
  - 4mmHg soft note
  - 20mmHg high note
- Mechanism is increase in uveal volume and choroidal thickening

Hypertension and IOP

Smoking and glaucoma

No association between smoking and glaucoma.

Omega-3 Fatty Acids and IOP

Dietary Omega 3 Fatty Acids Decrease Intraocular Pressure with Age by Increasing Aqueous Outflow.

Vingrys et al IOVS 2007

Fruits and vegetables:
Coleman et al 2008 AJO

Decrease OAG

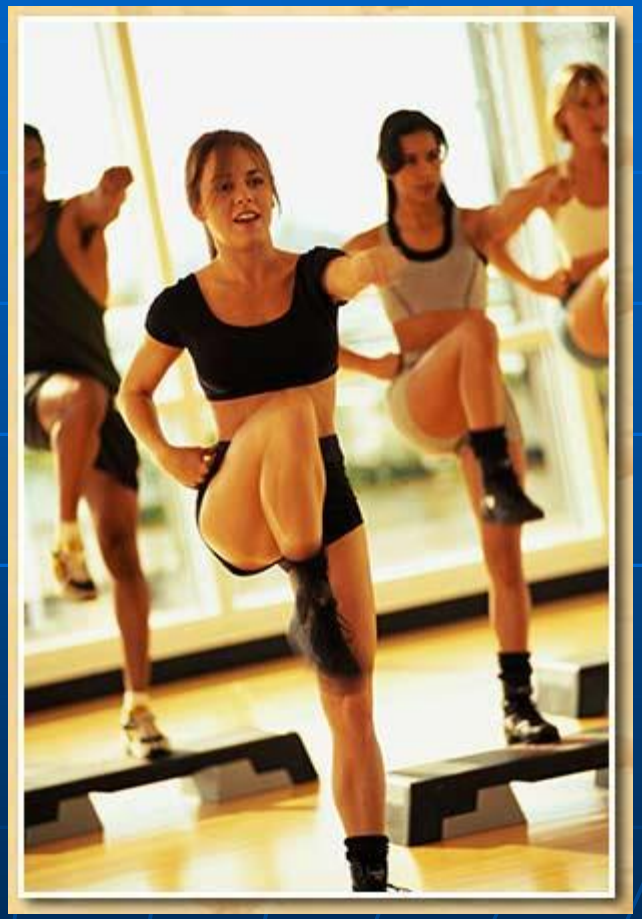
- by 69% in women who consumed at least one serving per month of green collards and kale compared with those who did not

Brassica family along with broccoli and cauliflower. The dark blue-green leaves that are smooth in texture.

- By 64% in women who consumed more than two servings per week of carrots

Exercise and IOP

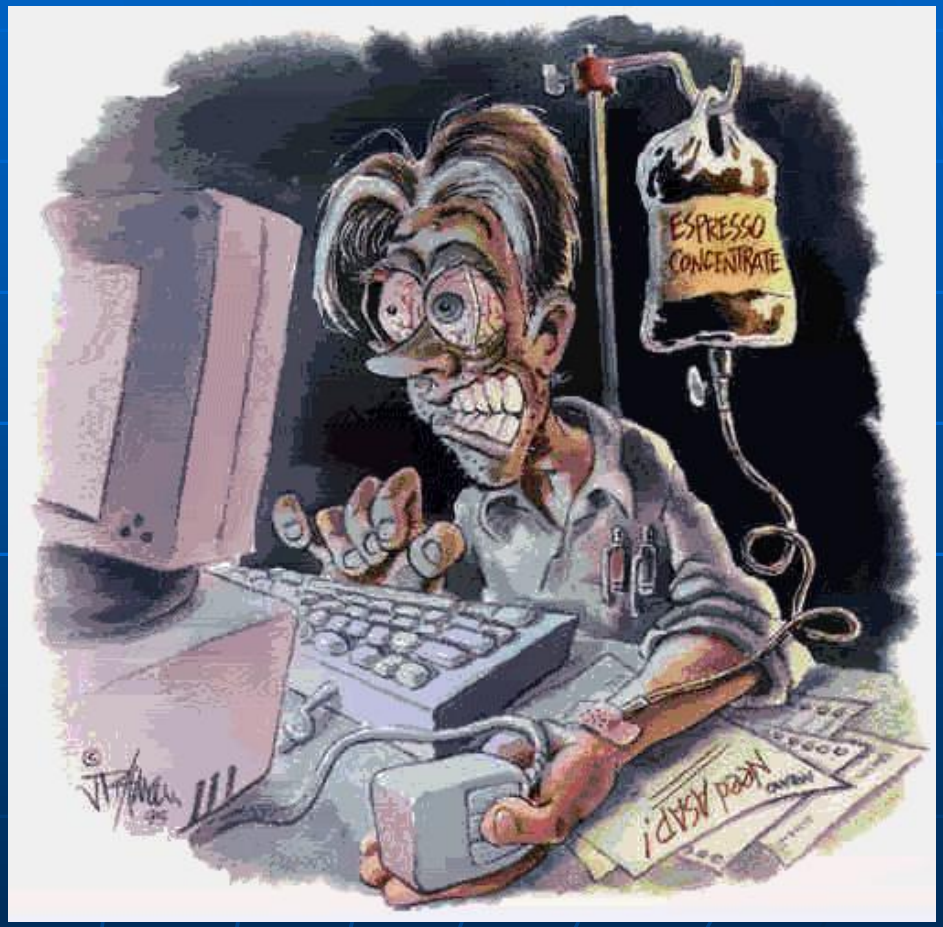
- Dynamic resistence training induces modest decrease in IOP acutely.
- Greater effect in women than men.



Stress and IOP

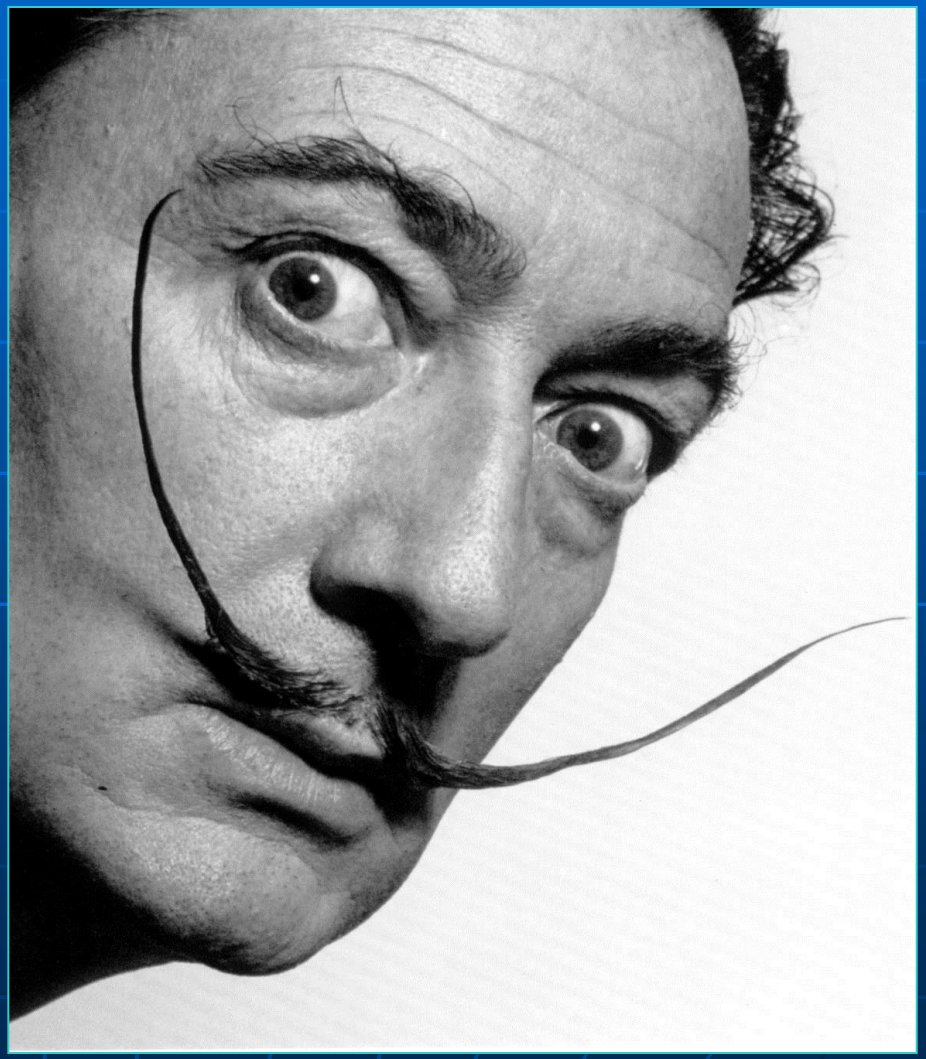
- No strong evidence.
- Psychosocial stress questionaire
- Positive correlation in female between stress score and IOP.

Journal of Physiological Anthropology



What is your role as a GP

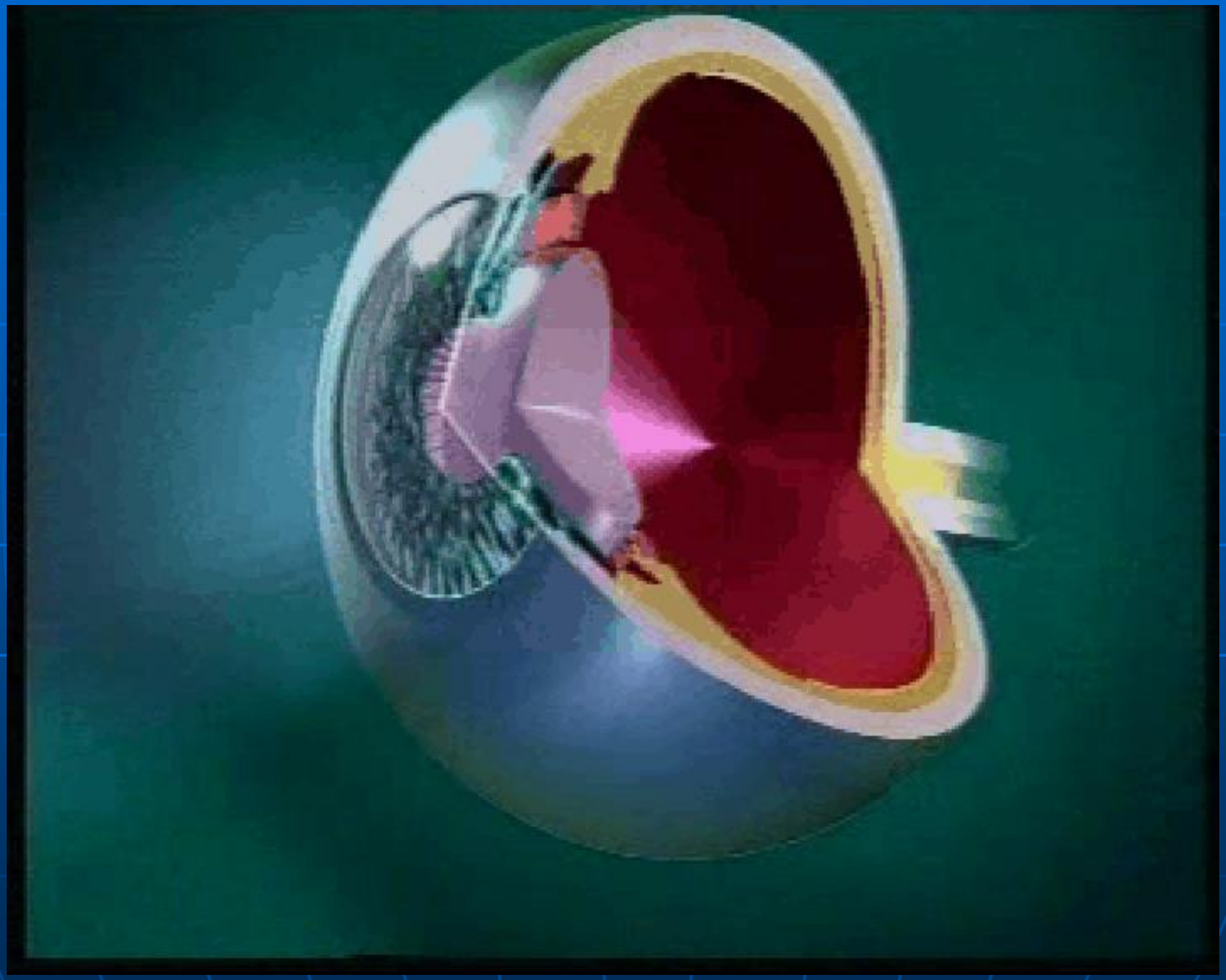
- Patient awareness
- Diagnostic
  - Family history
  - Optic disc
- Medication
  - Explanation
  - Re-prescribing
- Follow-up
  - medication
  - appointments



Thankyou

THE END

There is more to vision than just the eye



Types of glaucoma

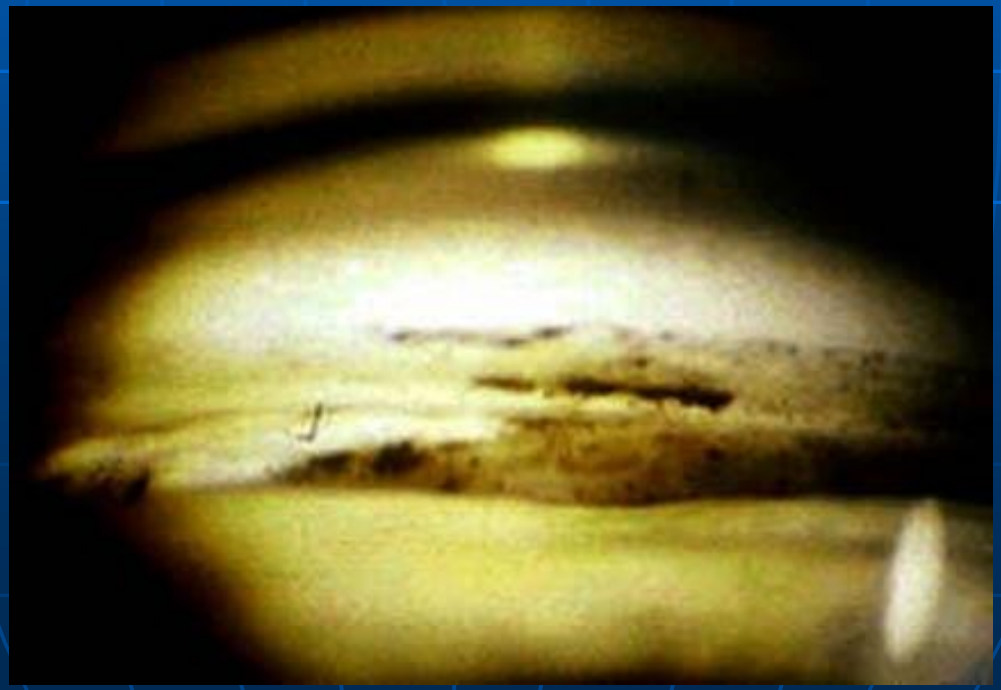
There are many types of glaucoma

Glaucoma can occur in babies, children, young adults and older

Much more common as we get older

Types of glaucoma

- Primary - glaucoma is present by itself
- Secondary - glaucoma due to another eye or whole body condition

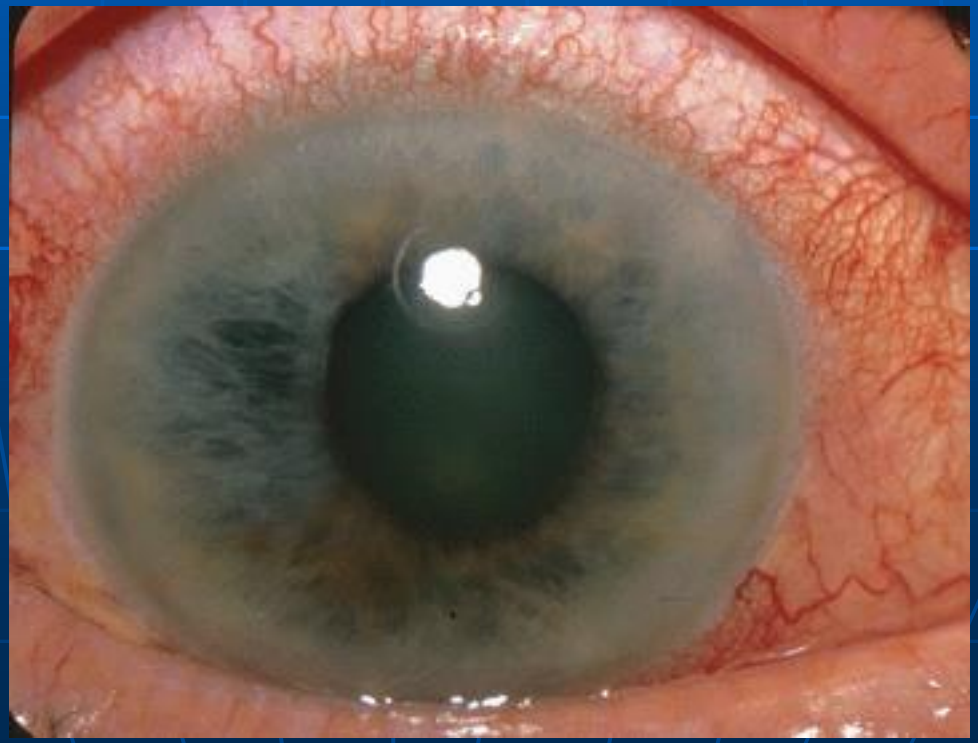


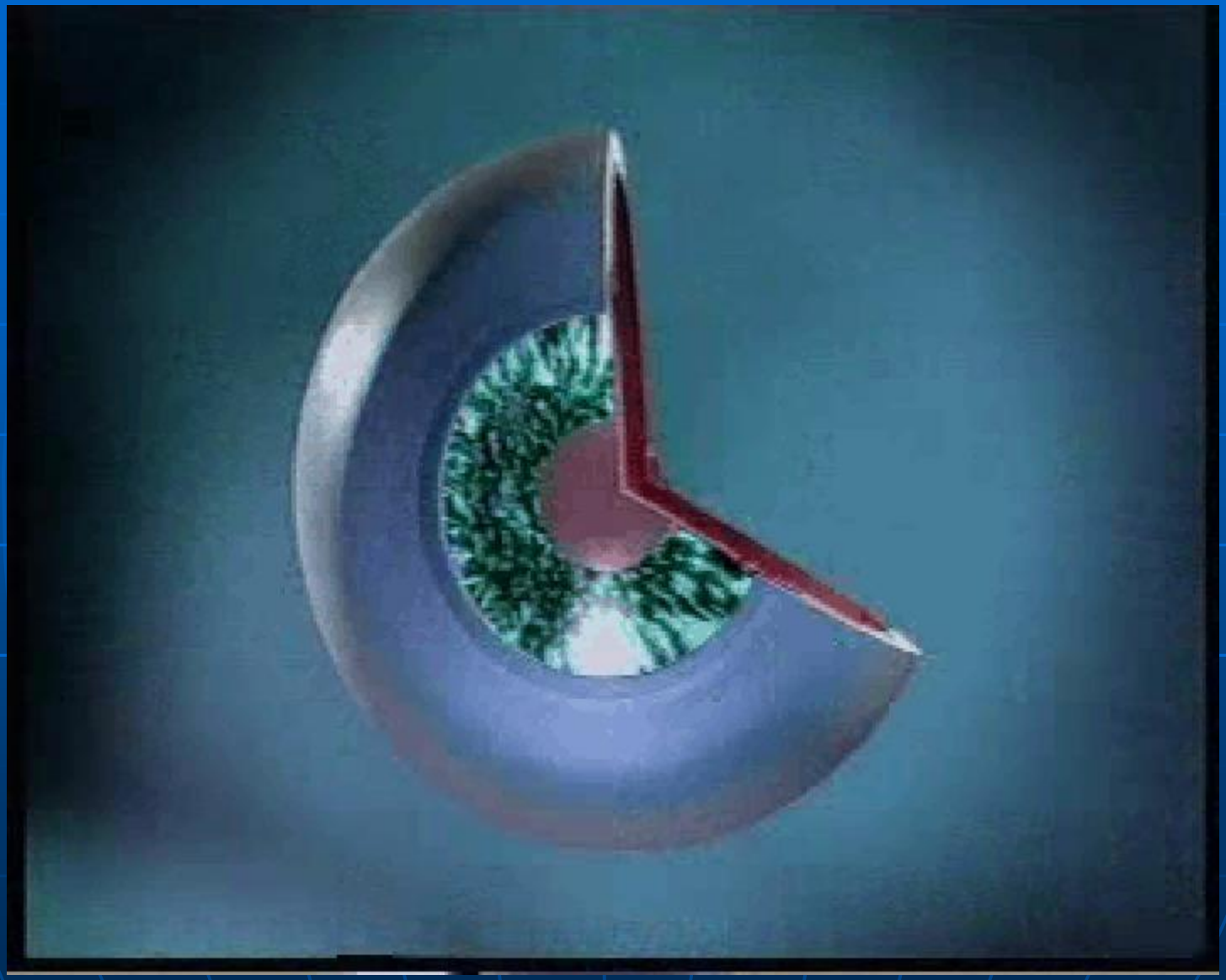
Types of glaucoma

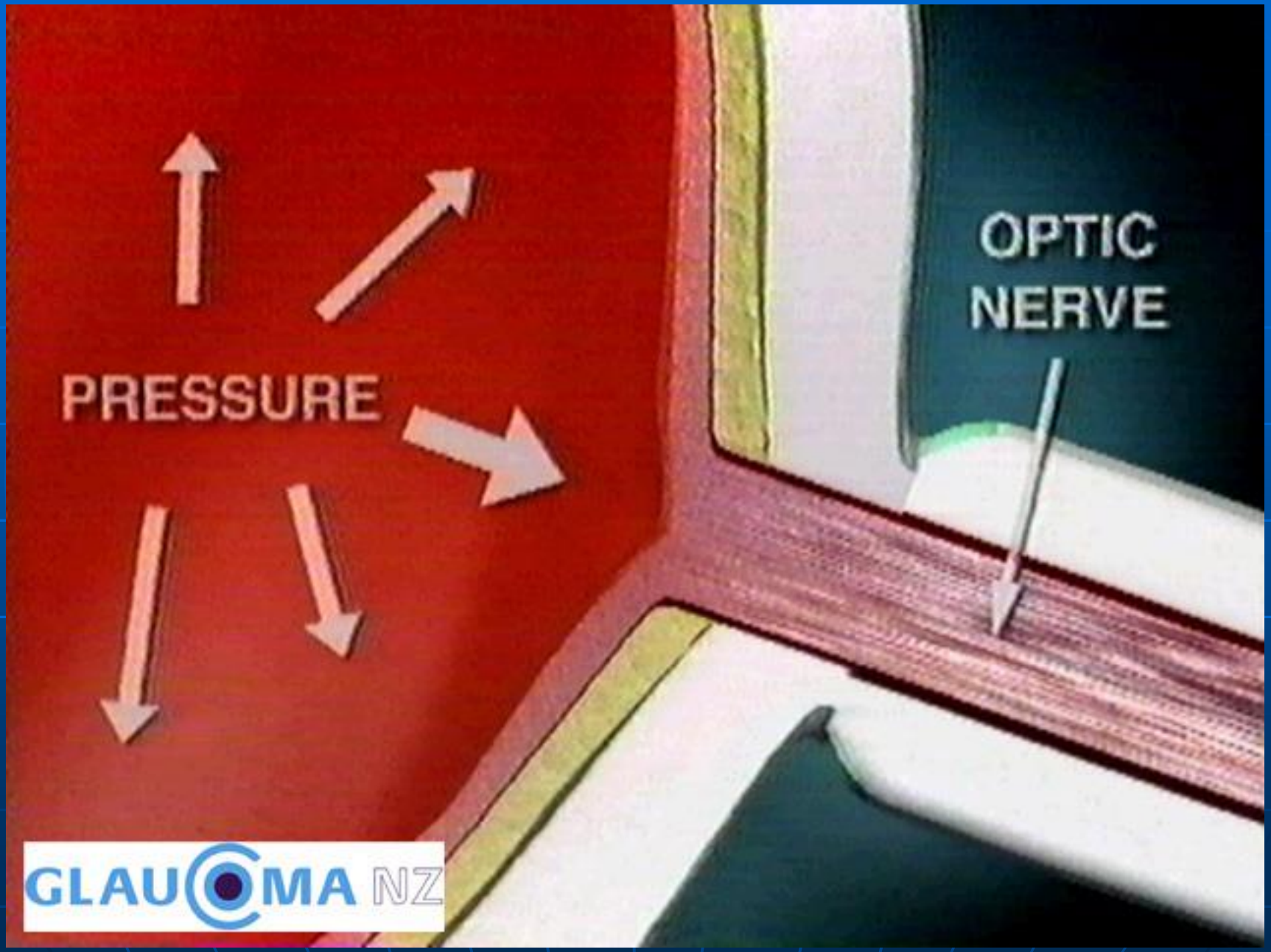
- Glaucoma can occur suddenly and very severely (acute glaucoma)

or

- very gradually (chronic glaucoma)






PRESSURE
OPTIC
NERVE
GLAUCOMA NZ

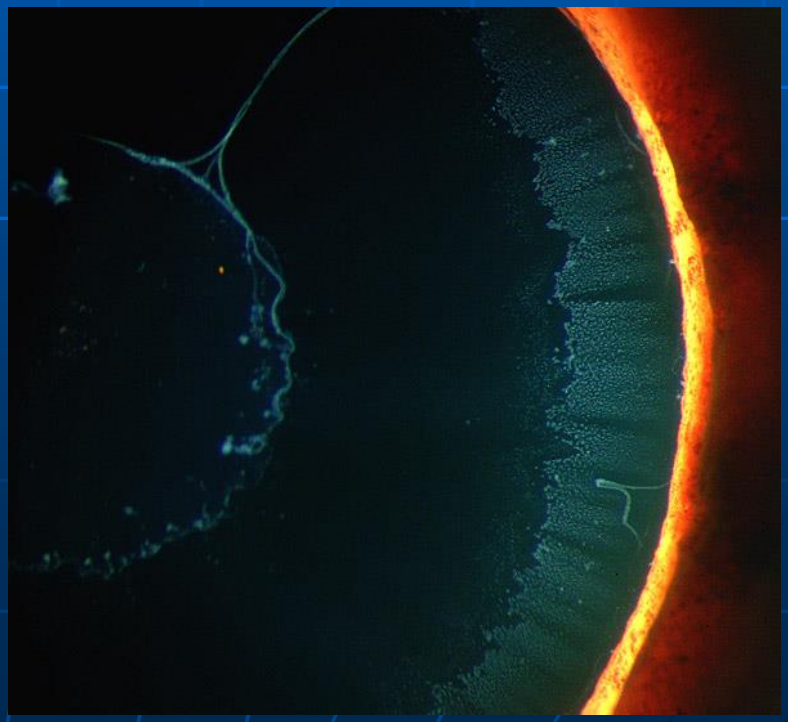
Normal visual fie

Abnormal visual field

Some types of Chronic Glaucoma

- Primary Open Angle Glaucoma (POAG)
- Normal Pressure Glaucoma (NTG)
- Pseudoexfoliation Glaucoma

all very common

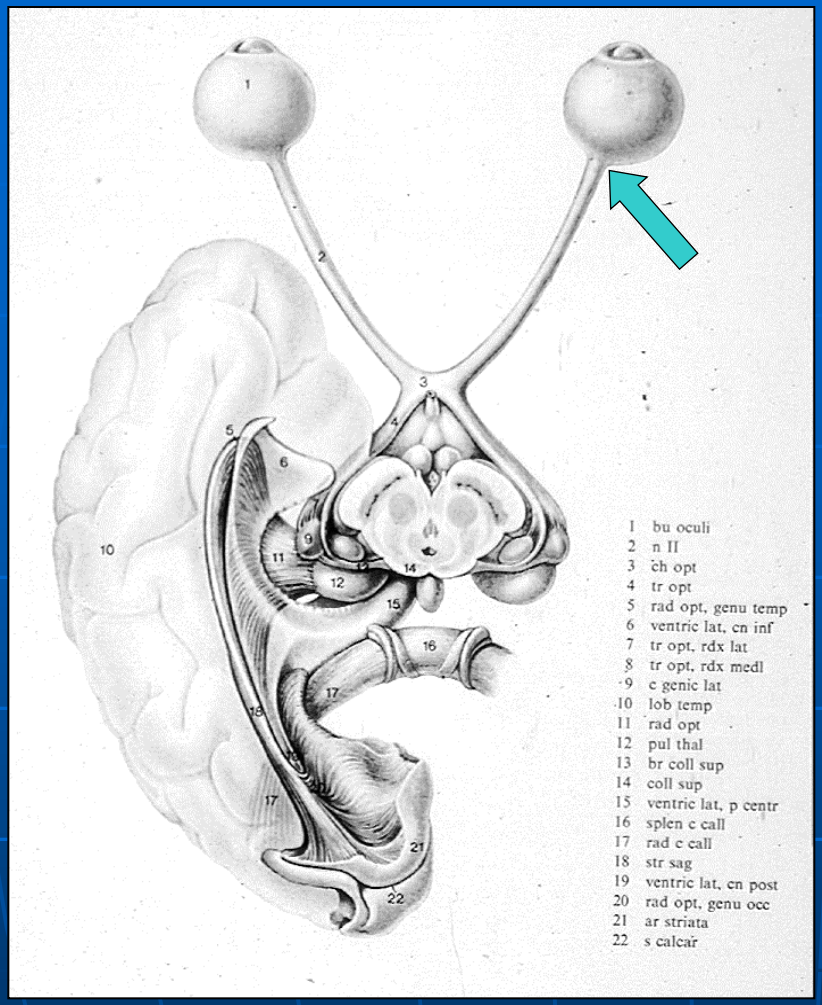


Pressure-lowering treatments:

1. Eye-drops
2. Tablets
3. Laser
4. Surgery

Eye surgeons use a number of quite different lasers... for quite different reasons

Laser treatment for glaucoma
is quite different from laser treatment
to “throw away your glasses” or for diabetic eye disease



1 bu oculi
2 n II
3 ch opt
4 tr opt
5 rad opt, genu temp
6 ventric lat, cn inf
7 tr opt, rdx lat
8 tr opt, rdx medl
9 c genic lat
10 lob temp
11 rad opt
12 pul thal
13 br coll sup
14 coll sup
15 ventric lat, p centr
16 splen c call
17 rad c call
18 str sag
19 ventric lat, cn post
20 rad opt, genu occ
21 ar striata
22 s calcar


PRESCRIPTION
ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
Combigan™
brimonidine tartrate
2 mg/mL and timolol
5 mg/mL eye drops
AUST R 97690
STERILE
5 mL
ALLERGAN


PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
LUMIGAN®
Bimatoprost eye drops
300 µg/mL
AUST R 80657
STERILE 3 mL
ALLERGAN
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
TRAVATAN®
0.004%
Travoprost Eye Drops
Alcon
2.5 mL
AUST R 79224
PRESCRIPTION MEDICINE
Xalatan®
0.005 %
latanoprost
Eye Drops
2.5 ml
PHARMACIA


BETAGAN
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
BETAGAN
0.5%
5mL
ALLERGAN
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
Cosopt
2%/0.5%
Dorzolamide hydrochloride and timolol maleate eye drops. Each 1 mL contains dorzolamide hydrochloride equivalent to 20 mg dorzolamide and timolol maleate equivalent to 5 mg timolol.
Sterile ophthalmic solution
5 mL
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
TIMOPTOL®
0.5%
Timolol maleate eye drops
Each 1 mL contains 6.8 mg timolol maleate (equivalent to 5 mg/mL of timolol)
Sterile ophthalmic solution
5 mL
PRESCRIPTION MEDICINE
5 mL
APO-TIMOP
TIMOLOL MALEATE OPHTHALMIC SOLUTION
USP
OPHTHALMIC DISPENSER
For External Use Only
Solution contains: timolol maleate equivalent to timolol 0.5%
0.5%
APOTEX NZ LTD


PRESCRIPTION ONLY
MEDICINE
KEEP OUT OF REACH OF CHILDREN
TRUSOPT®
Dorzolamide hydrochloride eye drops. Each 1 mL contains 22.3 mg dorzolamide hydrochloride (equivalent to 20 mg/mL of dorzolamide)
2%
Sterile ophthalmic solution
5 mL
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
AZOPT®
1.0%
Brinzolamide 10 mg/mL
Eye Drops
5 mL
AUST R 72750
Alcon®

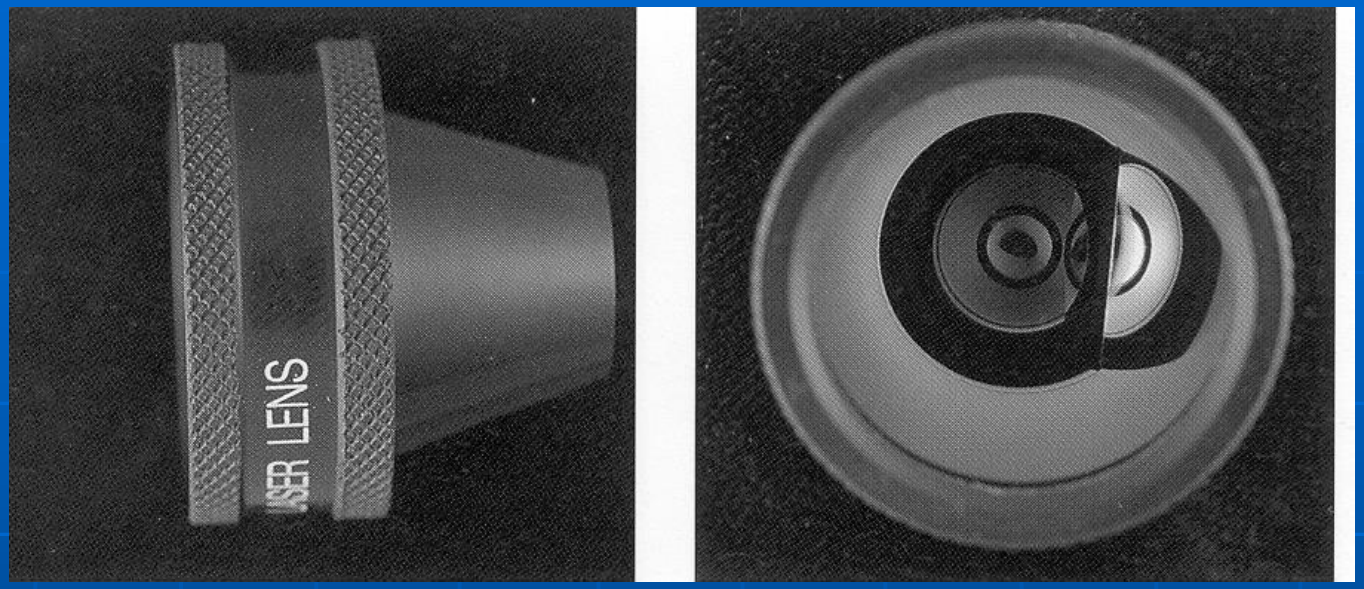

PRESCRIPTION
ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
Alphagan®
(brimonidine tartrate 2 mg per mL)
EYE DROPS
AUST R 60297
STERILE
5 mL
ALLERGAN

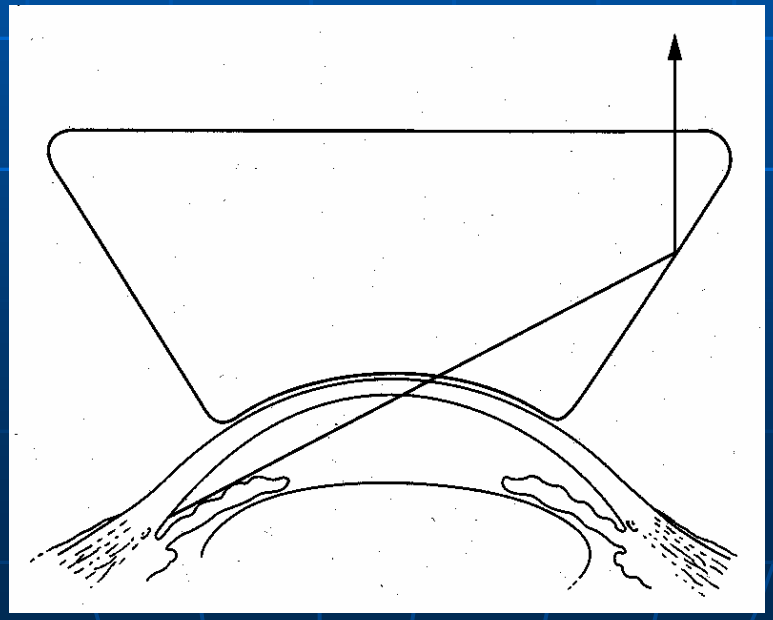

PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
TRUSOPT®
Dorzolamide hydrochloride eye drops. Each 1 mL contains 22.3 mg dorzolamide hydrochloride (equivalent to 20 mg/mL of dorzolamide)
2%
Sterile ophthalmic solution
5 mL
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
Cosopt®
2%/0.5%
Dorzolamide hydrochloride and timolol maleate eye drops. Each 1 mL contains dorzolamide hydrochloride equivalent to 20 mg dorzolamide and timolol maleate equivalent to 5 mg timolol.
Sterile ophthalmic solution
5 mL
PRESCRIPTION MEDICINE
5 mL
APO-TIMOP
TIMOLOL MALEATE OPHTHALMIC SOLUTION
USP
OPHTHALMIC DISPENSER
For External Use Only
Solution contains: timolol maleate equivalent to timolol 0.5%
0.5%
Pharmacode 452955

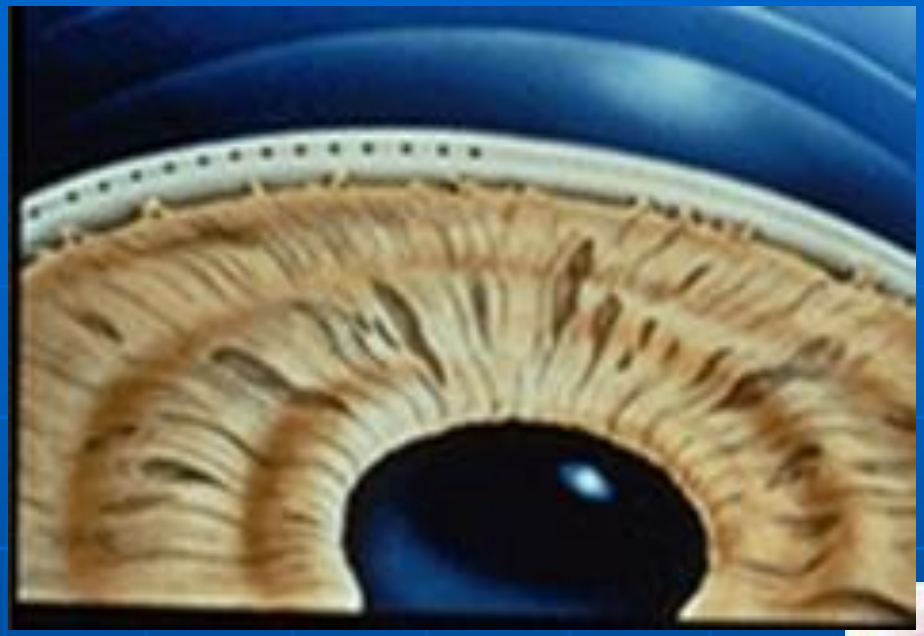

TIMOPTOL®
0.5%
Usual adult dosage:
One drop in the eye(s) once or twice a day as directed by the Physician.
This product is sterile when manufactured and should be dispensed in the original unopened container. Instruct patient on precautions to avoid contamination.
Do not remove bottle from the carton until immediately prior to use.
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
Combigan™
brimonidine tartrate
2 mg/mL and timolol
5 mg/mL eye drops
AUST R 97690
STERILE
5 mL
ALLERGAN
PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN
Alphagan®
(brimonidine tartrate 2 mg per mL)
EYE DROPS
AUST R 60297
STERILE
5 mL
ALLERGAN

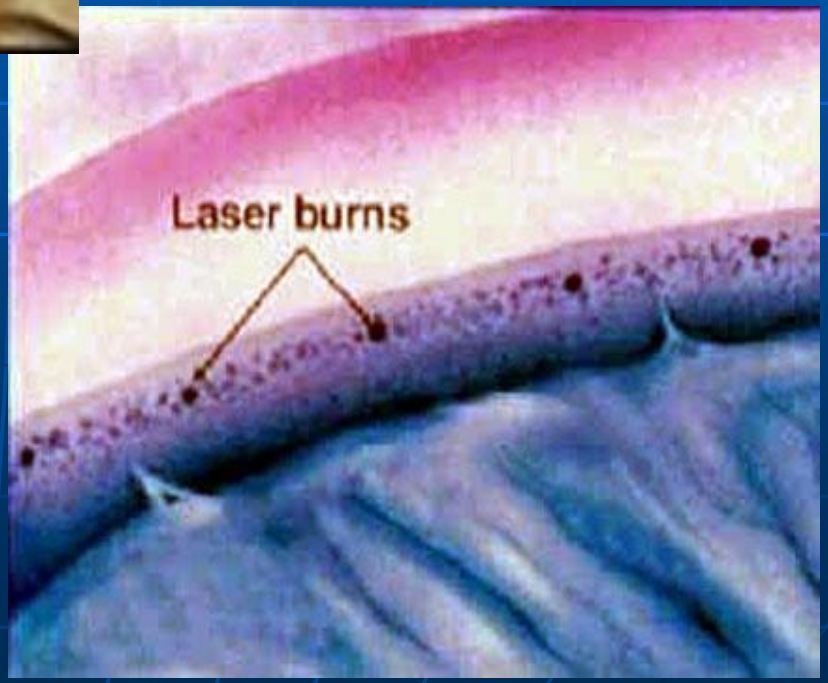
Laser trabeculoplasty *minuses*:

- Often doesn't work
- May just lower pressure a little.
- May only lower pressure for a limited period


LENS






Laser burns

Laser trabeculoplasty :

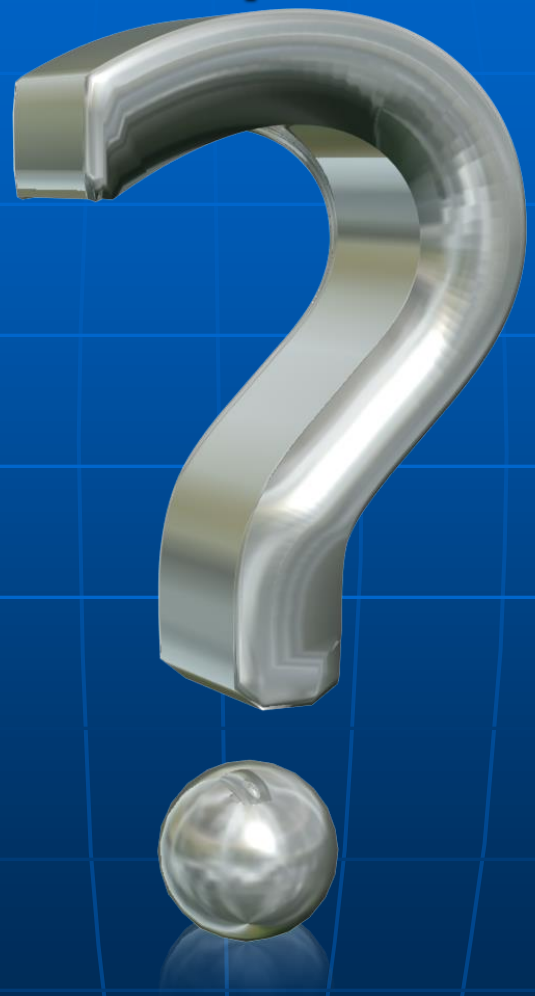
Pros

- Easy to perform
- *quick with minimal discomfort*
- Very safe
- Can be effective for years
- Problems associated with eye-drops can be avoided

Cons

- Often doesn’t work
- Min IOP lowering
- Short term

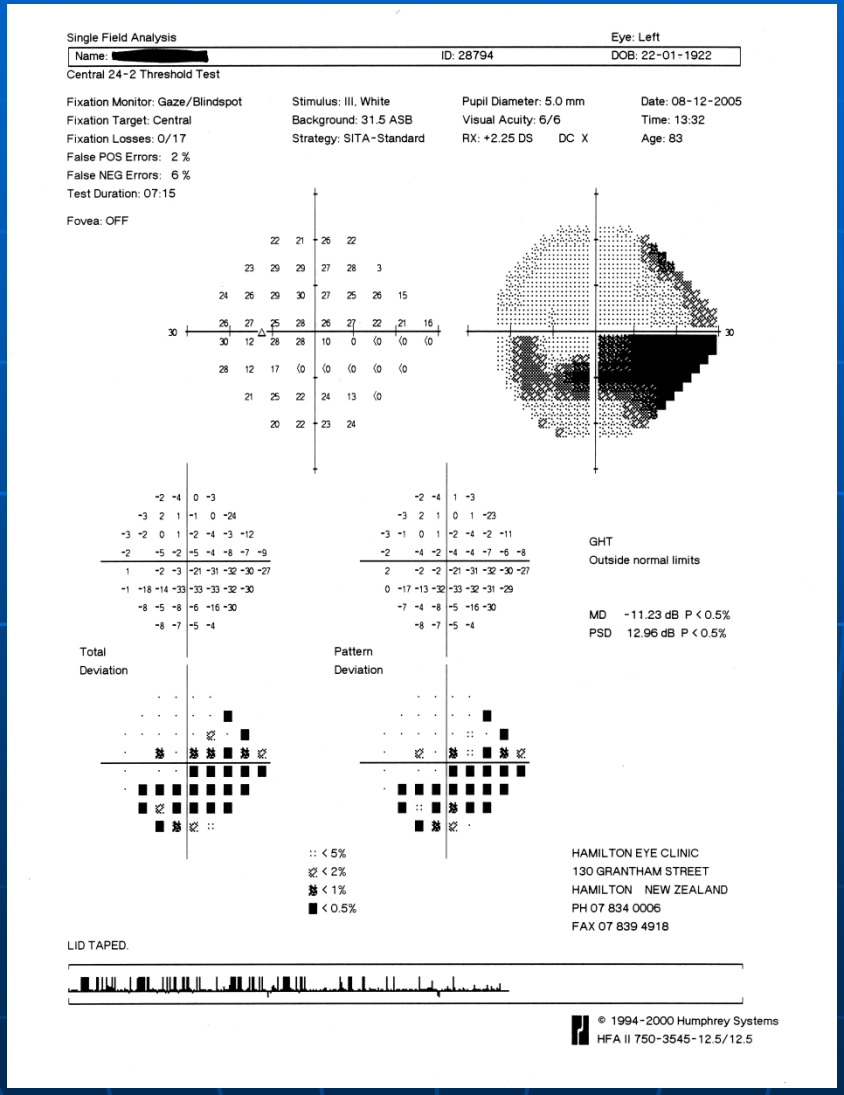
Beyond Eye Drops, patient participation



“IS THERE ANYTHING I CAN DO?”

- ✓Learn about the disease
- ✓Keep regular appointments
- ✓Comply with treatment
- ✓Tell your family to get their eyes checked
- ✓Support Glaucoma NZ – become a member

Moderate field loss



Single Field Analysis — Eye: Left

Name: [redacted] ID: 28794 DOB: 22-01-1922

Central 24-2 Threshold Test

Fixation Monitor: Gaze/Blindspot
Fixation Target: Central
Fixation Losses: 0/17
False POS Errors: 2 %
False NEG Errors: 6 %
Test Duration: 07:15

Stimulus: III, White
Background: 31.5 ASB
Strategy: SITA-Standard

Pupil Diameter: 5.0 mm
Visual Acuity: 6/6
RX: +2.25 DS DC X

Date: 08-12-2005
Time: 13:32
Age: 83

Fovea: OFF

GHT
Outside normal limits

MD -11.23 dB P < 0.5%
PSD 12.96 dB P < 0.5%

Total Deviation

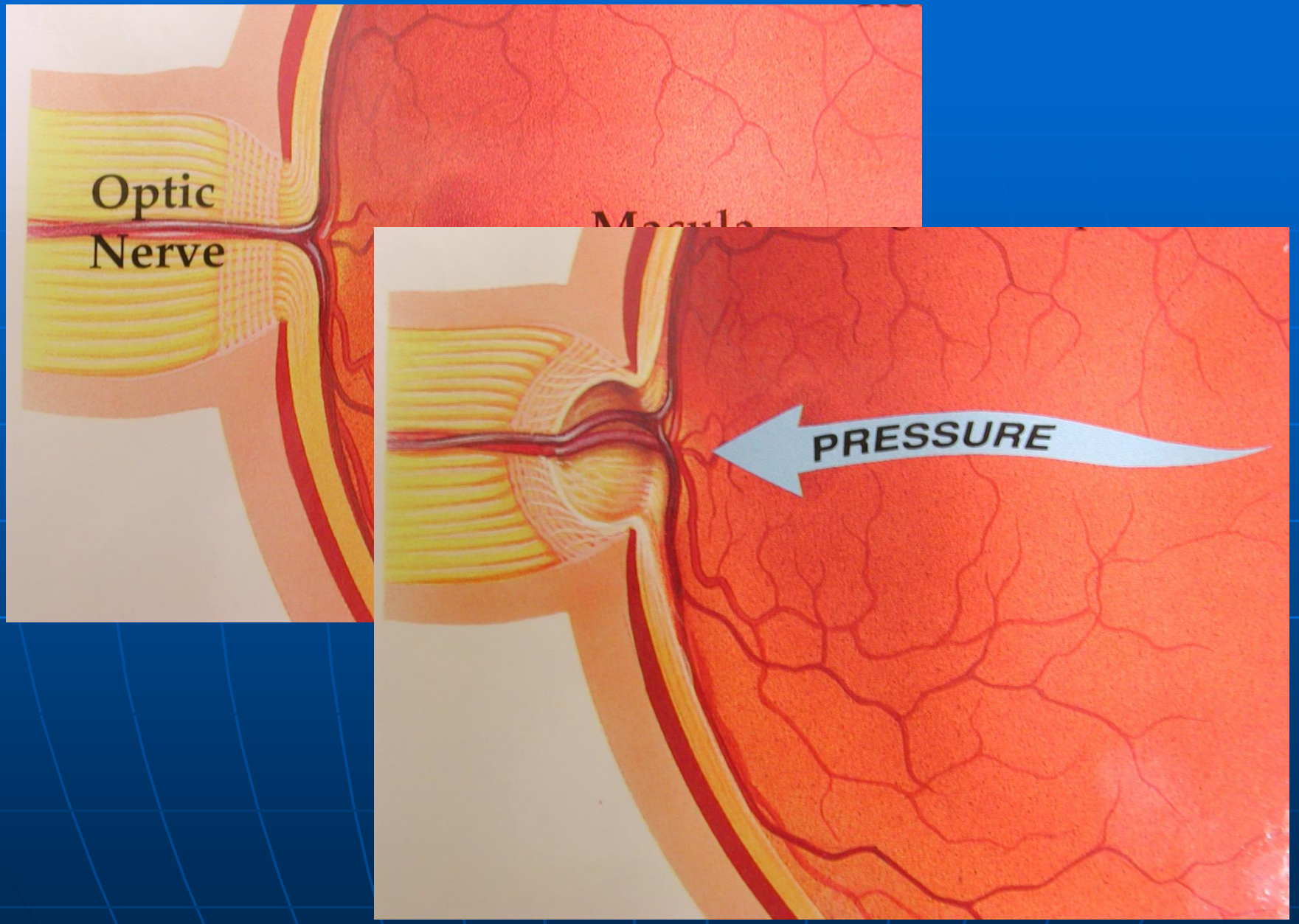
Pattern Deviation

:: < 5%
※ < 2%
※ < 1%
■ < 0.5%

HAMILTON EYE CLINIC
130 GRANTHAM STREET
HAMILTON NEW ZEALAND
PH 07 834 0006
FAX 07 839 4918

LID TAPED.

HFA II 750-3545-12.5/12.5


Optic
Nerve
PRESSURE

Publications

Eyelights

GLAUCOMA NZ
TO SAVE SIGHT

The Newsletter of Glaucoma NZ
Volume 8 | Issue 3 | October 2009

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The New York Times
Friday 17th July 2009

A New Understanding of Glaucoma

By Peter Jaret

For years, glaucoma was defined as elevated pressure within the eye that leads to vision loss. And for years experts knew there were glaring gaps in that definition. Many people with abnormally high intraocular pressure never develop glaucoma. As many as one in three people who do get the disease have normal or even low pressure.

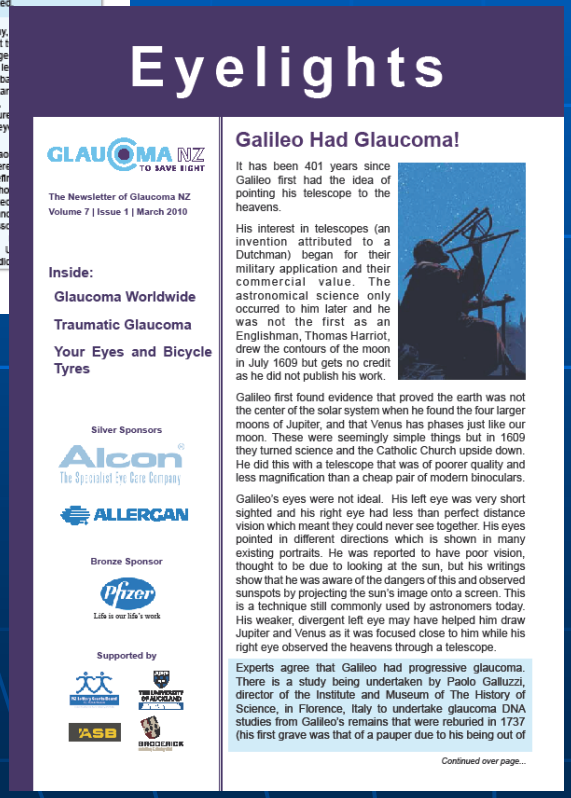
As researchers have tried to resolve those contradictions, a new paradigm for understanding glaucoma has emerged. Glaucoma isn't simply an eye disease, experts now say, but rather a degenerative nerve disorder, not unlike Alzheimer's or Parkinson's disease.

"All three of these diseases affect aging populations and involve selective loss of certain populations of neurons," said Dr. Neeru Gupta, a professor of ophthalmology and director of the glaucoma unit at the University of Toronto. "Parkinson's affects motor control. Alzheimer's affects cognition. Glaucoma disrupts vision. But the closer we look, the more they seem to have in common."

Even the official definition of glaucoma, a disease that accounts for more than eight million cases of blindness worldwide, has changed.

Today, on just t damage which le at the be brain, ar vision, measure in an ey

"Intrac nowhere the defi you ho changed McKinn professo and Duke of Medic



Eyelights

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TO SAVE SIGHT

The Newsletter of Glaucoma NZ
Volume 7 | Issue 1 | March 2010

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Galileo Had Glaucoma!

It has been 401 years since Galileo first had the idea of pointing his telescope to the heavens.

His interest in telescopes (an invention attributed to a Dutchman) began for their military application and their commercial value. The astronomical science only occurred to him later and he was not the first as an Englishman, Thomas Harriot, drew the contours of the moon in July 1609 but gets no credit as he did not publish his work.

Galileo first found evidence that proved the earth was not the center of the solar system when he found the four larger moons of Jupiter, and that Venus has phases just like our moon. These were seemingly simple things but in 1609 they turned science and the Catholic Church upside down. He did this with a telescope that was of poorer quality and less magnification than a cheap pair of modern binoculars.

Galileo's eyes were not ideal. His left eye was very short sighted and his right eye had less than perfect distance vision which meant they could never see together. His eyes pointed in different directions which is shown in many existing portraits. He was reported to have poor vision, thought to be due to looking at the sun, but his writings show that he was aware of the dangers of this and observed sunspots by projecting the sun's image onto a screen. This is a technique still commonly used by astronomers today. His weaker, divergent left eye may have helped him draw Jupiter and Venus as it was focused close to him while his right eye observed the heavens through a telescope.

Experts agree that Galileo had progressive glaucoma. There is a study being undertaken by Paolo Galluzzi, director of the Institute and Museum of The History of Science, in Florence, Italy to undertake glaucoma DNA studies from Galileo's remains that were reburied in 1737 (his first grave was that of a pauper due to his being out of

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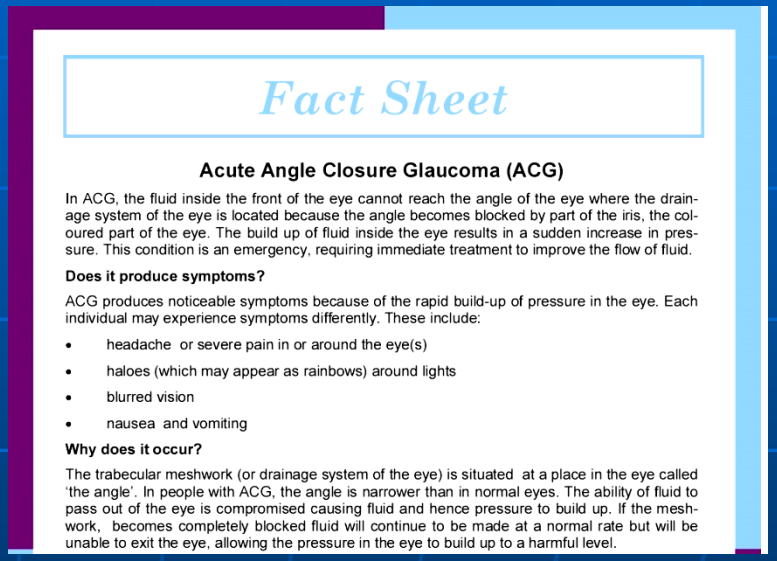

Fact Sheet

Acute Angle Closure Glaucoma (ACG)

In ACG, the fluid inside the front of the eye cannot reach the angle of the eye where the drainage system of the eye is located because the angle becomes blocked by part of the iris, the coloured part of the eye. The build up of fluid inside the eye results in a sudden increase in pressure. This condition is an emergency, requiring immediate treatment to improve the flow of fluid.

Does it produce symptoms?

ACG produces noticeable symptoms because of the rapid build-up of pressure in the eye. Each individual may experience symptoms differently. These include:

- headache or severe pain in or around the eye(s)
- haloes (which may appear as rainbows) around lights
- blurred vision
- nausea and vomiting

Why does it occur?

The trabecular meshwork (or drainage system of the eye) is situated at a place in the eye called 'the angle'. In people with ACG, the angle is narrower than in normal eyes. The ability of fluid to pass out of the eye is compromised causing fluid and hence pressure to build up. If the meshwork, becomes completely blocked fluid will continue to be made at a normal rate but will be unable to exit the eye, allowing the pressure in the eye to build up to a harmful level.

Early detection is vital

Have an eye test

Glaucoma NZ promotes 45 + 5 ‘rule’

Tell family and friends