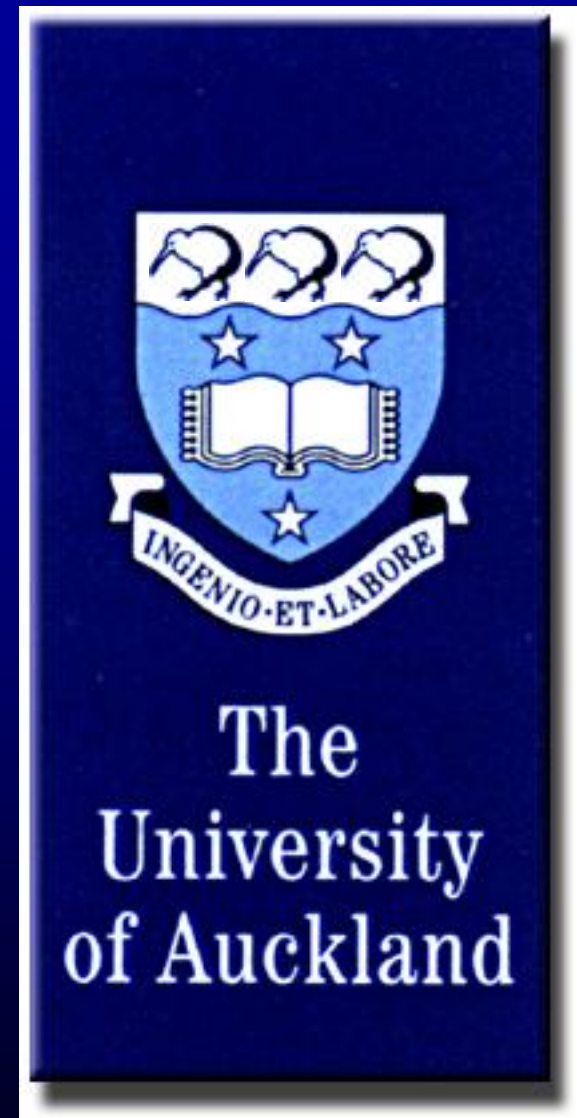


Eye Assessment and External/Anterior Segment Treatment Strategies

Professor Charles NJ McGhee

PhD,FRCS,FRCOphth,FRANZCO

New Zealand National Eye Centre
University of Auckland



History Presenting of Complaint

Mostly a combination of a small number of the following symptoms:

- Loss of vision
- Photopsia
- Diplopia

- Redness
- Pain
- Photophobia
- Grittiness
- Itchiness

- Discharge
- Watering

Specific HISTORY

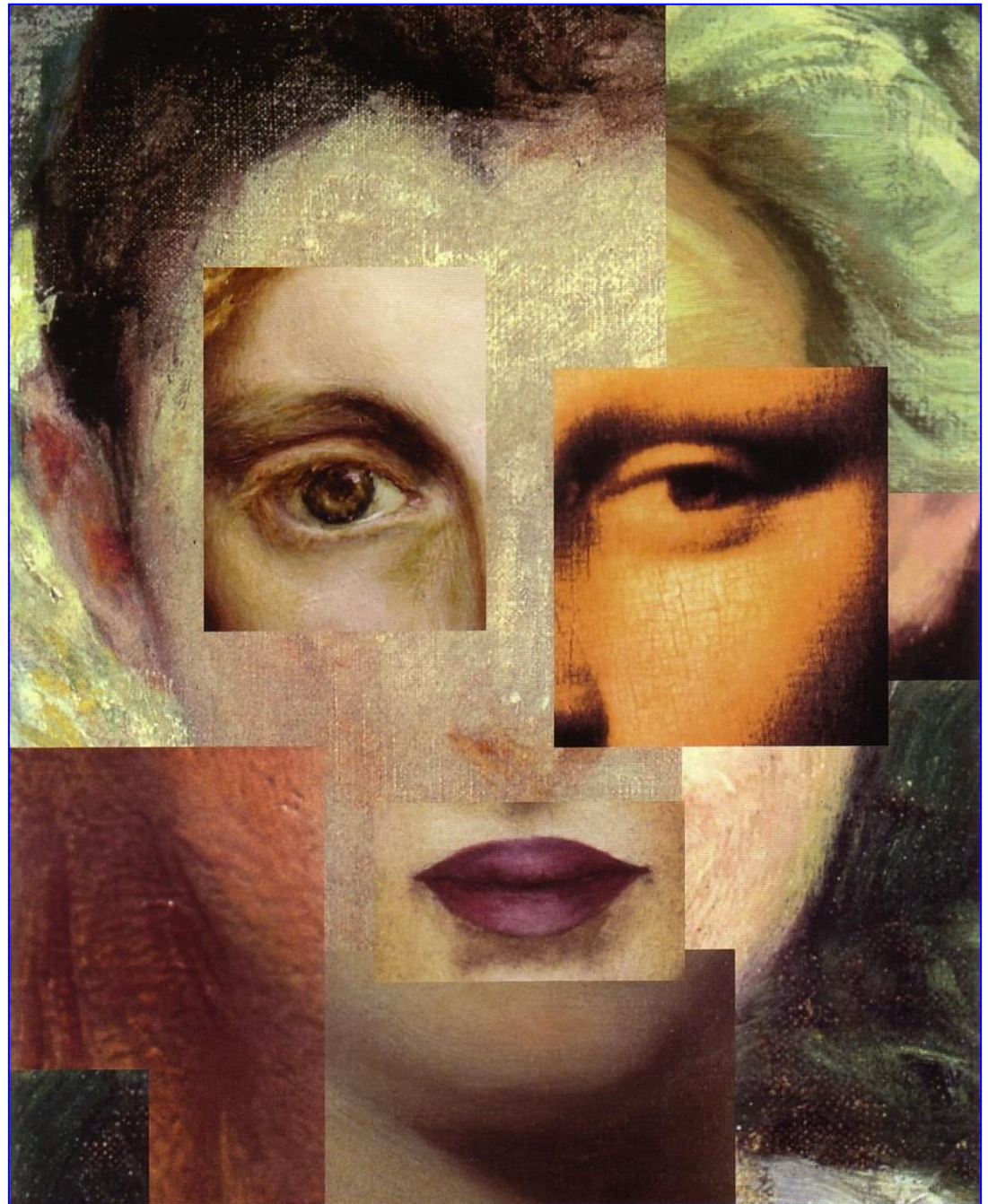
VISION CHANGE

REDNESS

DISCHARGE

PAIN

- Nature
- Onset
- Photophobia



Develop techniques to get a **full** history



EXAMINATION:

Techniques specific to practice



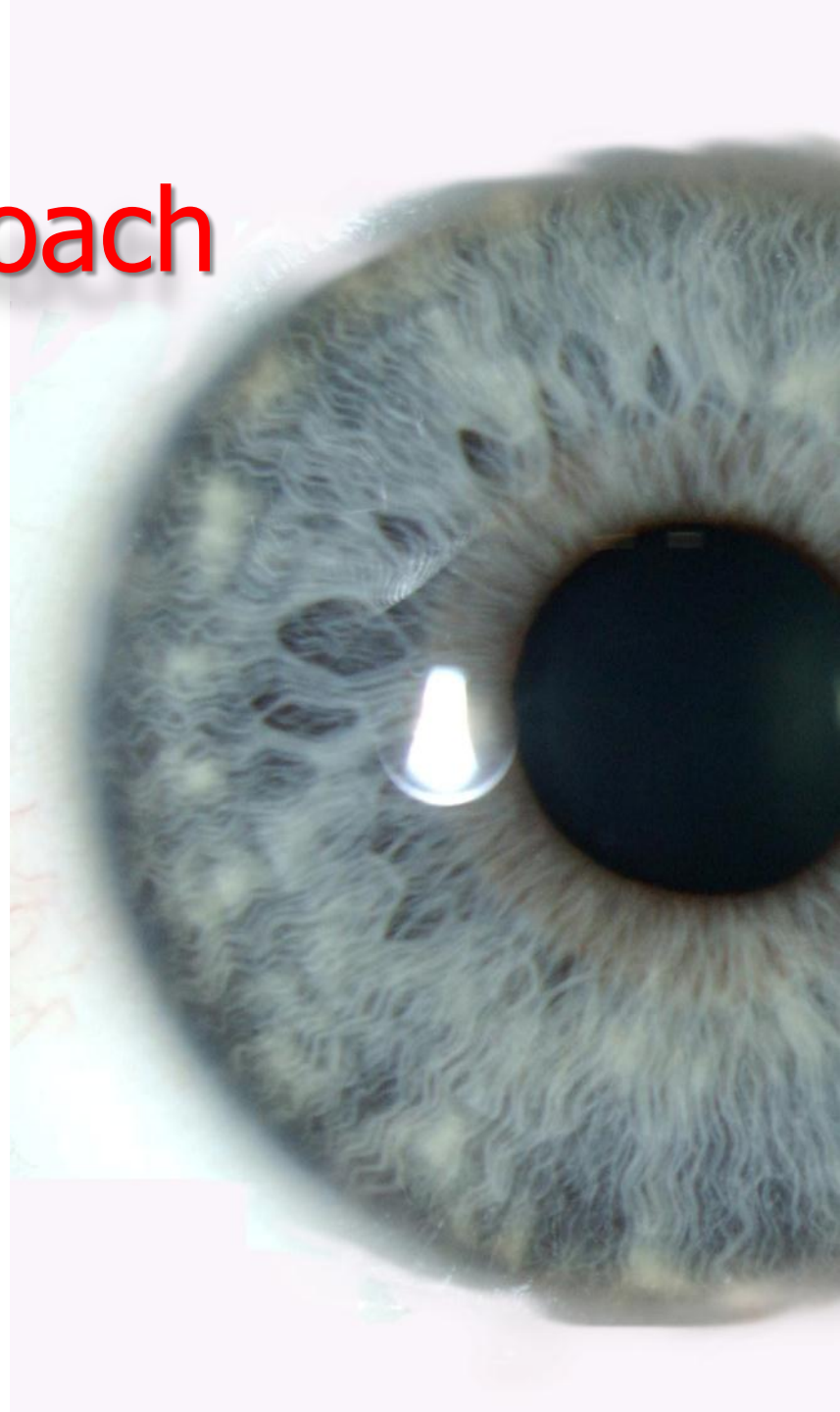
Fido gets his nose checked



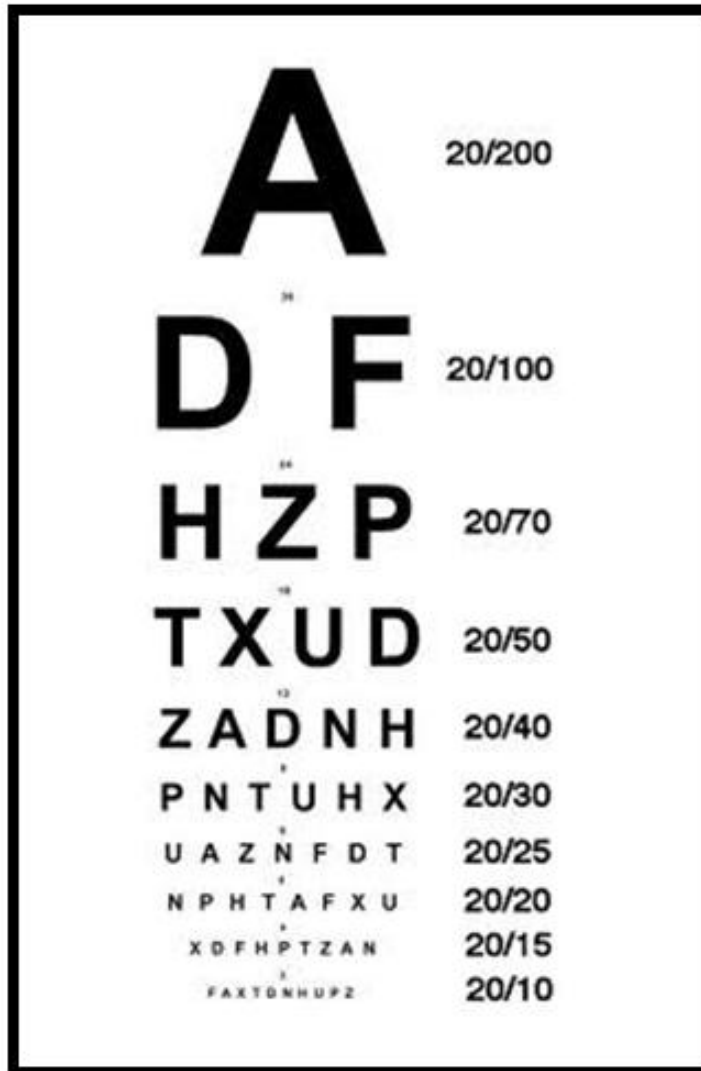
Examination

A systematic approach

1. Vision
2. Pupils
3. Fields to confrontation
4. Eye movements
5. External eye
6. Red reflex
7. *Posterior segment*



SNELLEN VISUAL ACUITY



Distance patient
read chart

Line read

6/60

6/18

6/6

6/4

Visual acuity (distance)

Test using a Snellen chart at correct distance

Check with distance correction if worn

One eye at a time

Use pinhole if vision is less than 6/9



Visual acuity (Distance)

Unaided, with spectacles, +/- pinhole



If vision poor with spectacles pinhole may fully correct - suggesting an **optometry** review and spectacle update

RECORDING POOR VISUAL ACUITY



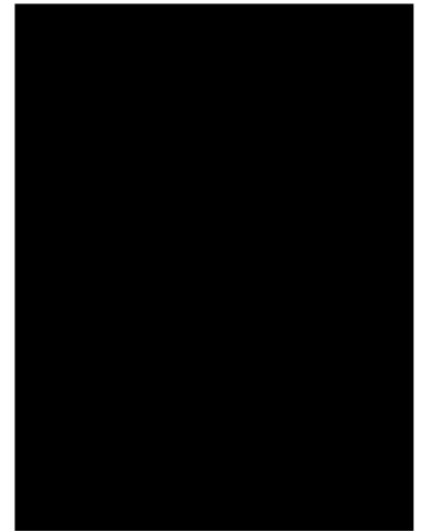
CF



HM



PofL



NPL

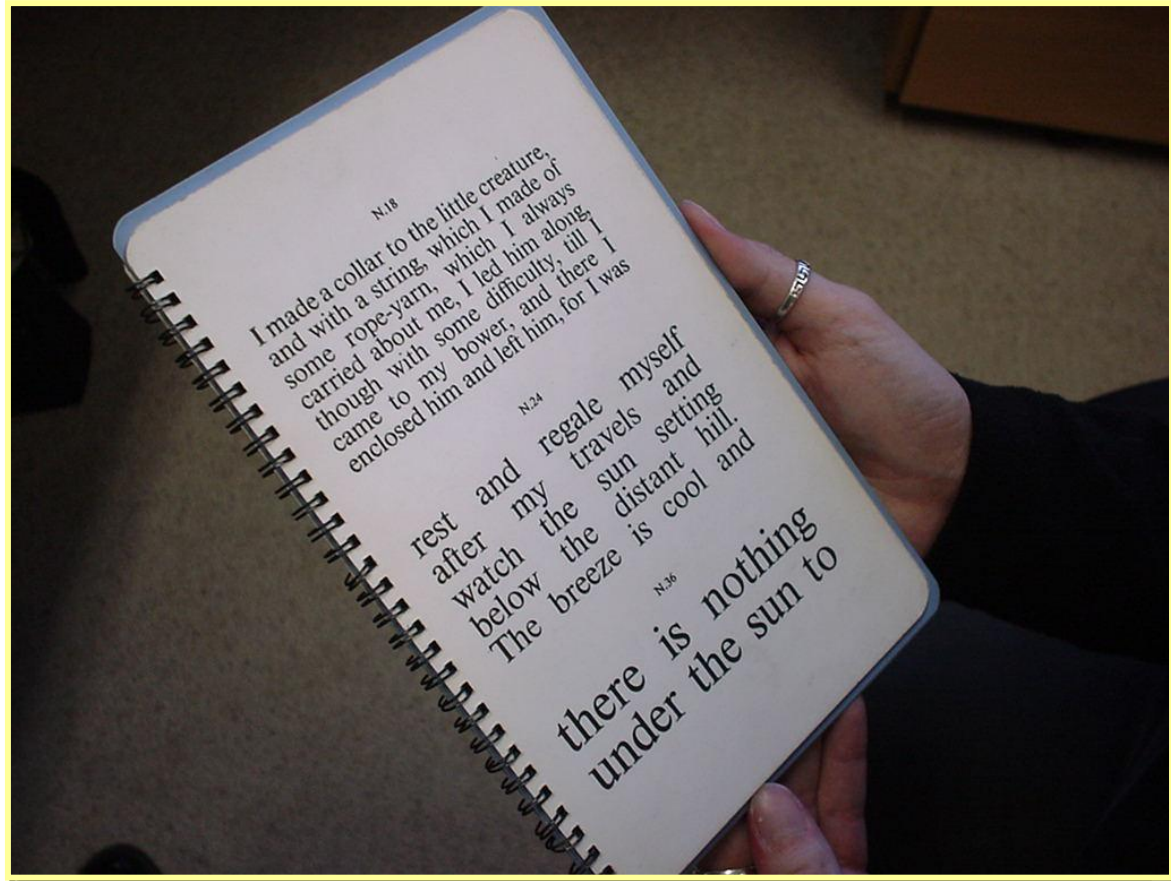
Visual acuity (Near)

Use near correction
if worn (likely if >45
years/presbyopic)

One eye at a time
then binocularly

Can use pinhole if
forgotten readers

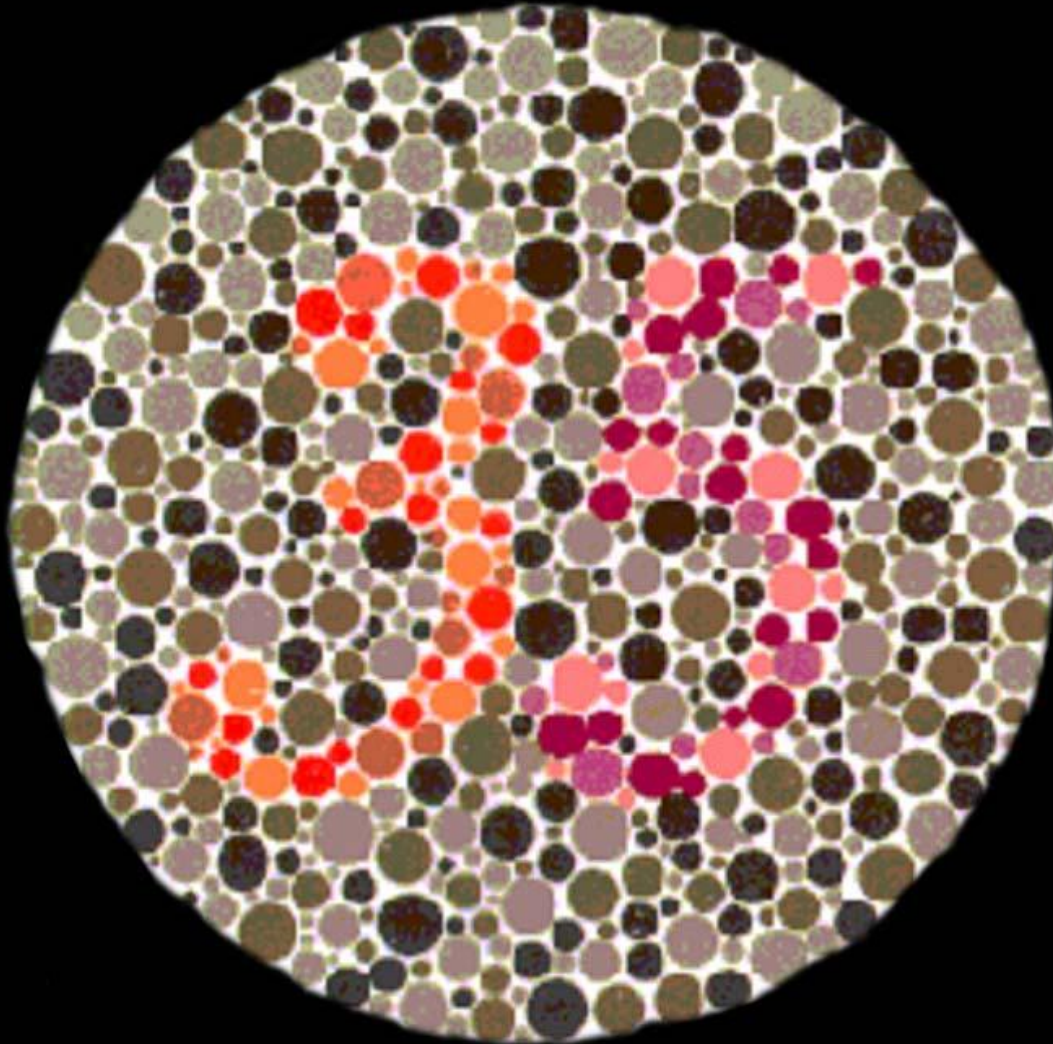
Normal near vision is
N5 - N6



Colour Vision

Inherited colour deficiency
Optic neuritis

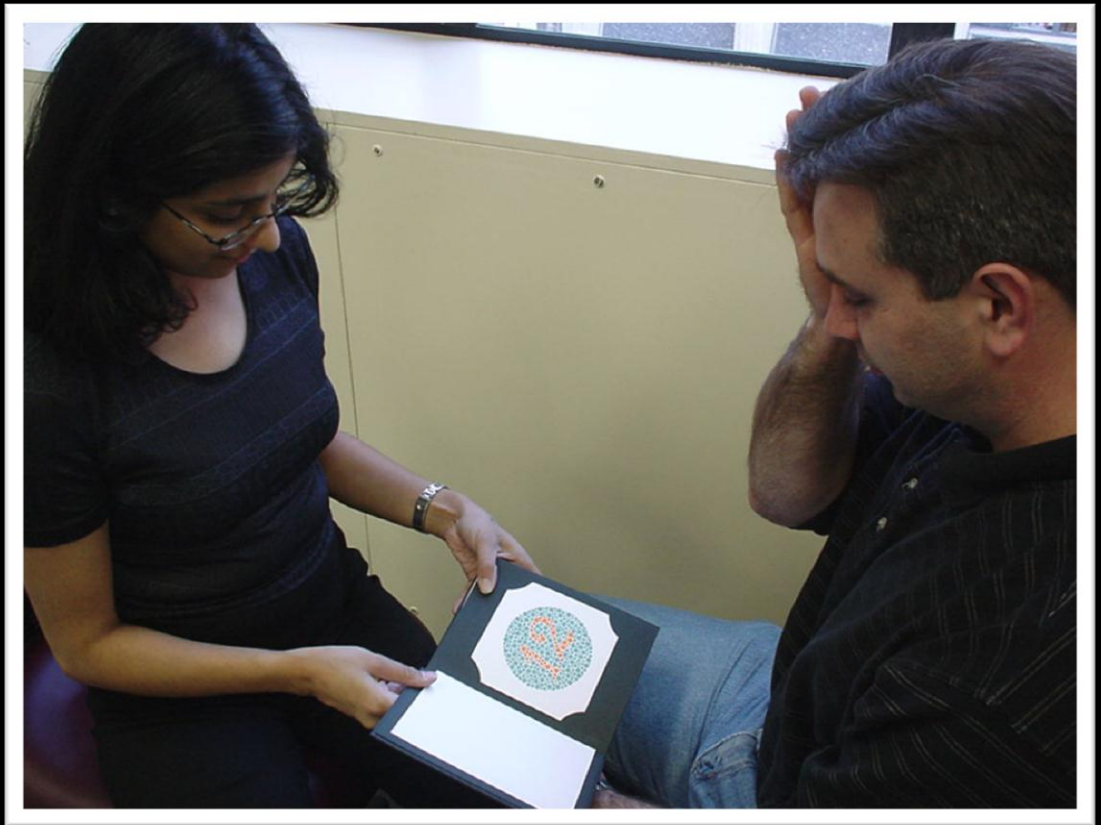
Colour Vision

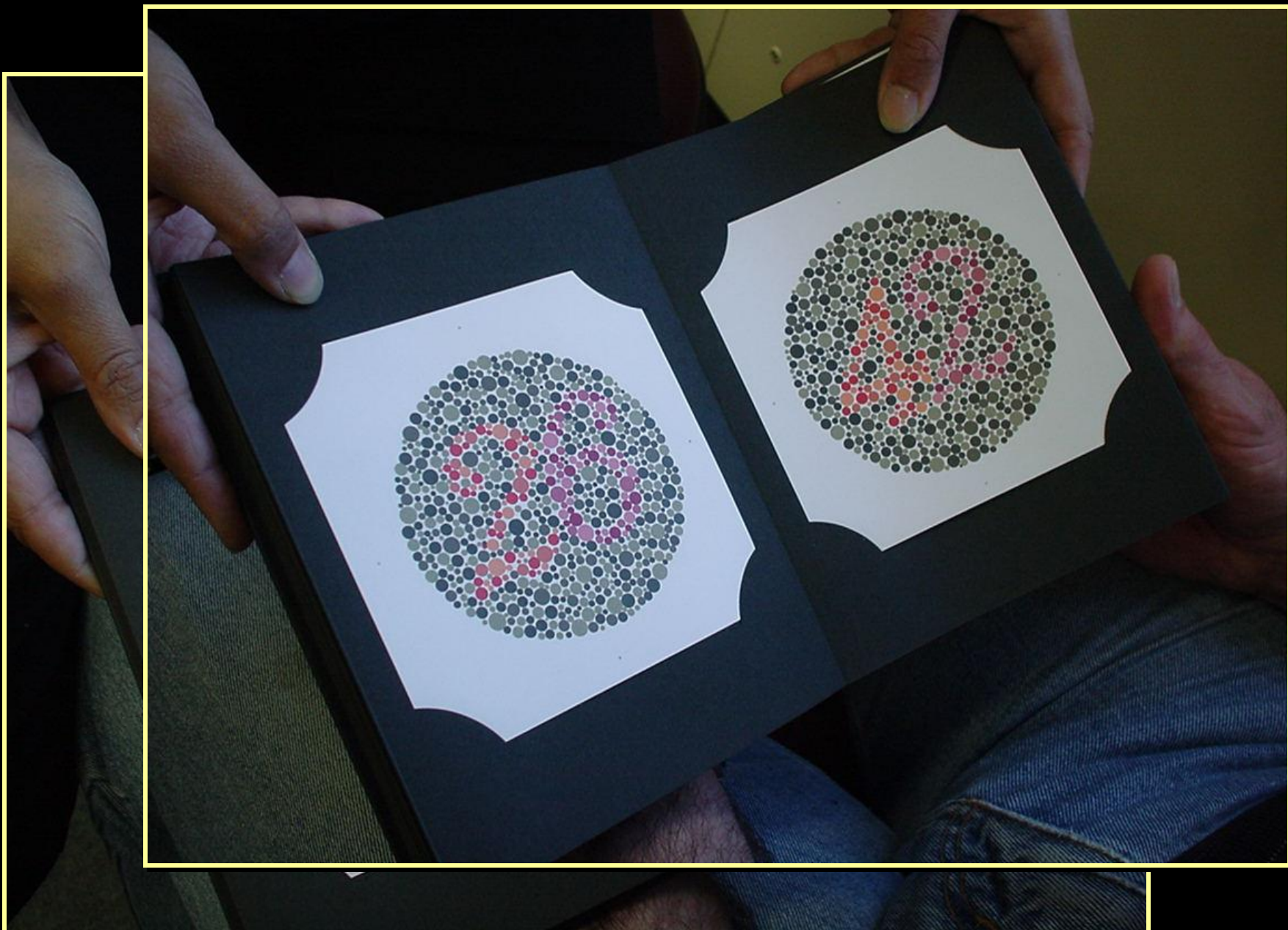


Colour Vision

Ideally: Use
Ishihara
chart to test
for colour
vision defects.
preferably in
natural light.

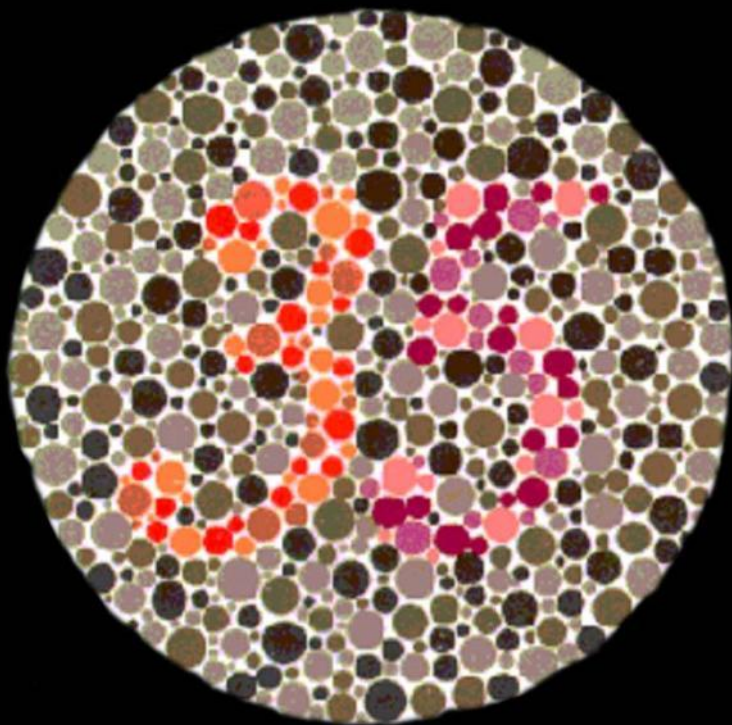
Cons: cost





Colour Vision Simplified

Red targets

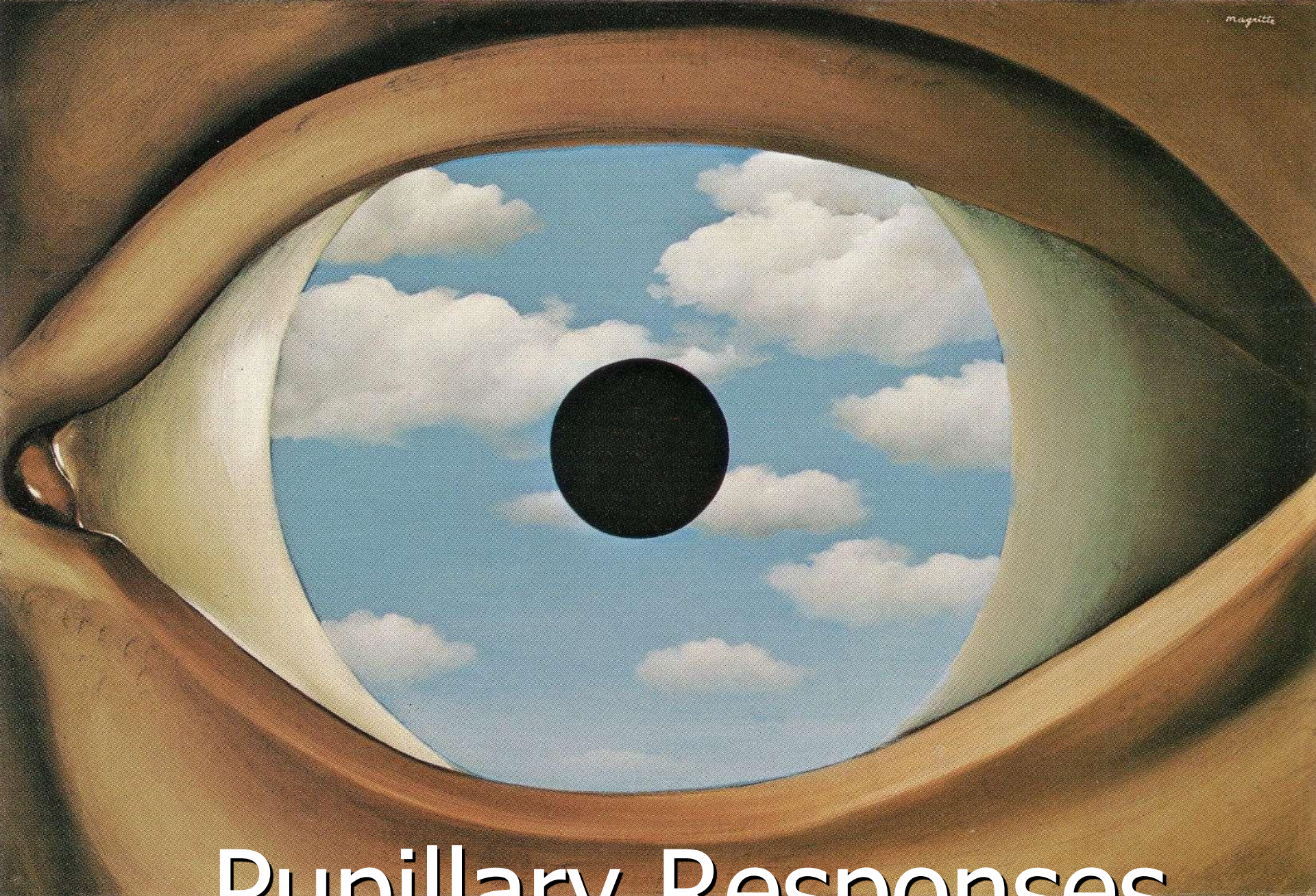


Key Points: Color Vision

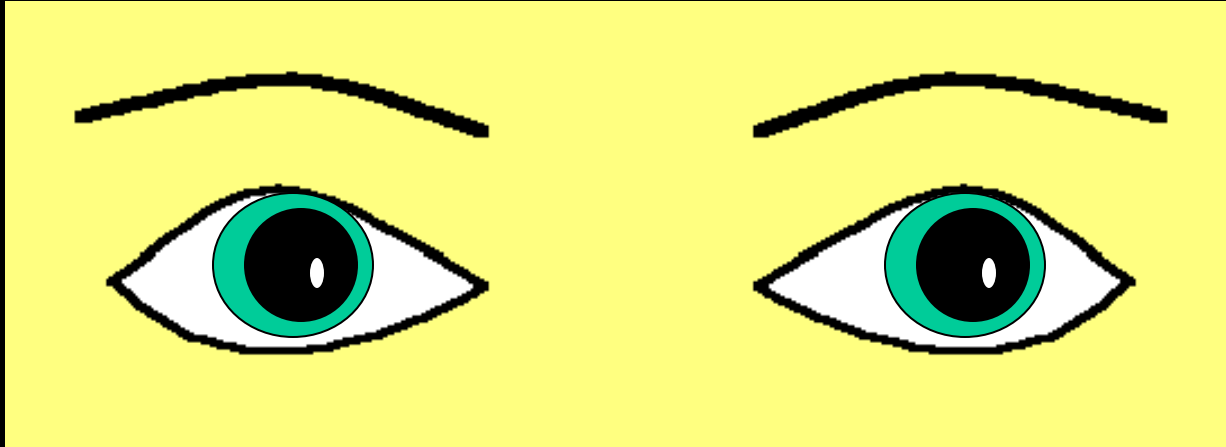
- Color vision may be significantly impaired with optic neuropathy *even with preserved visual acuity*.
 - (except ion is glaucoma)
- When acquired retinal disease causes decrease in colour vision, *visual acuity is usually significantly reduced*.

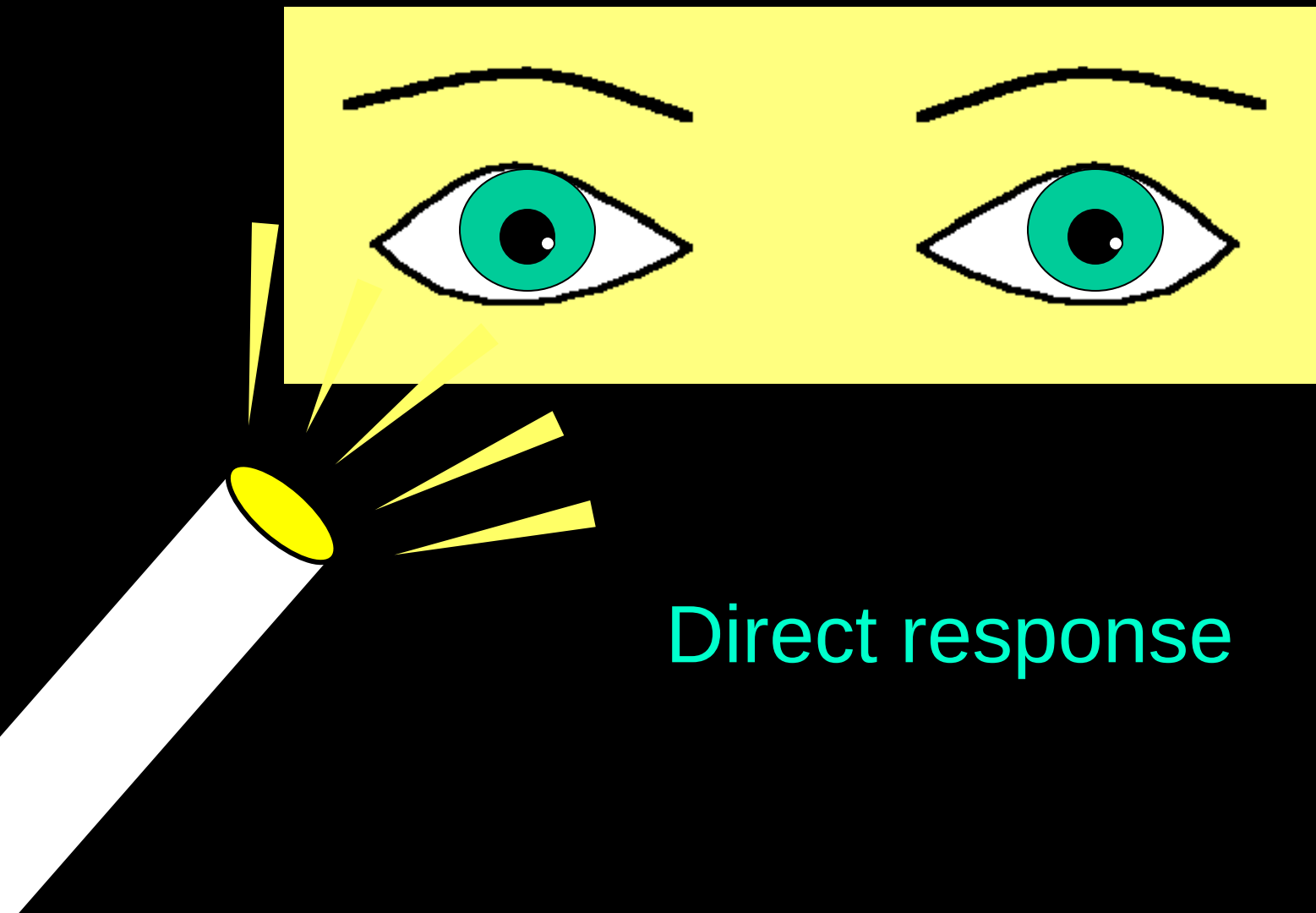
Colour Vision: Clinical significance

Asymmetric colour vision loss
suggests optic neuropathy until
proven otherwise!

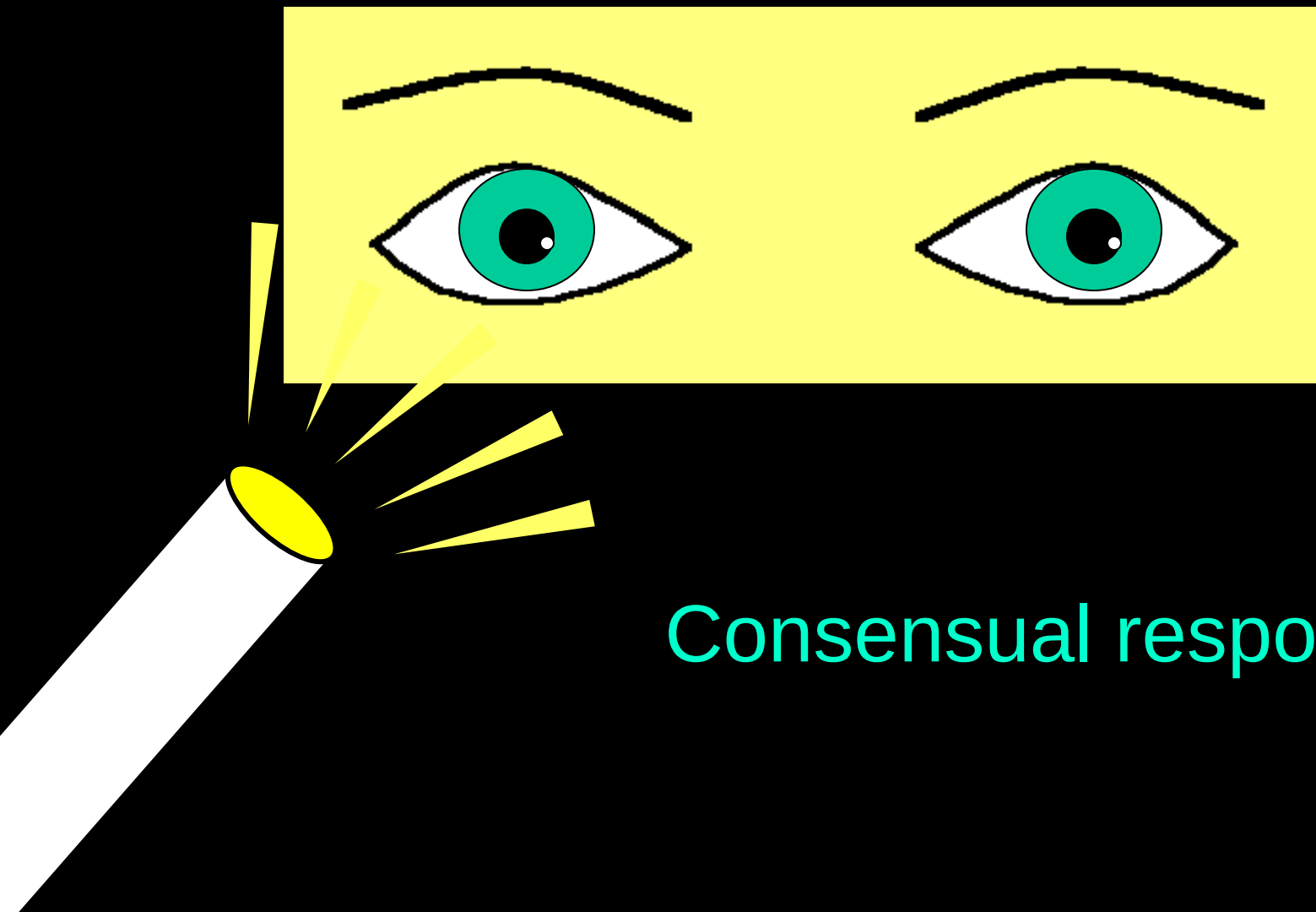


Pupillary Responses

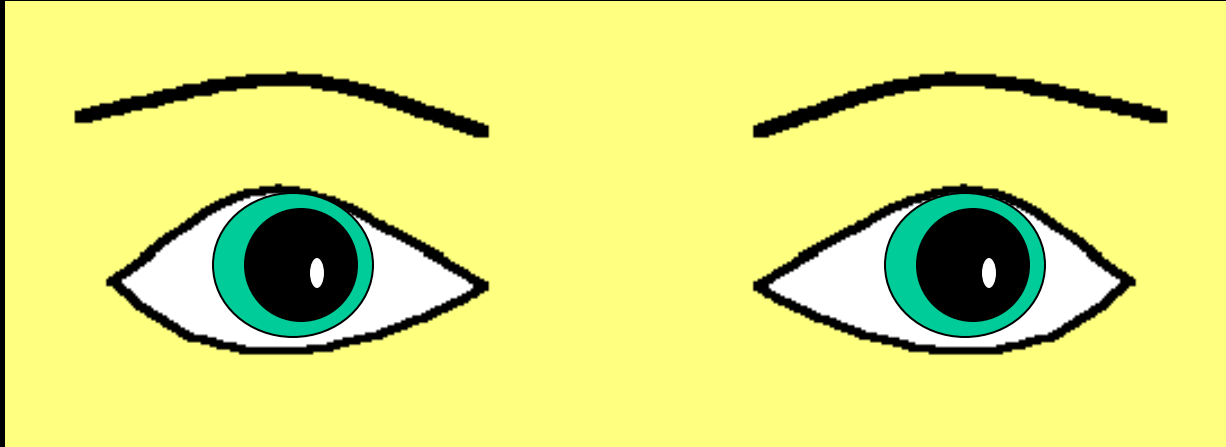


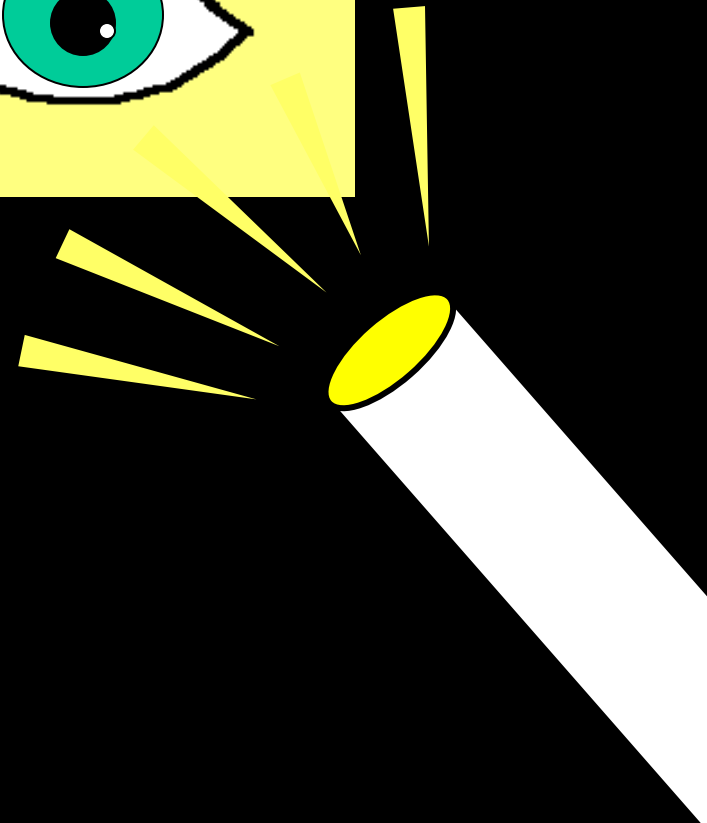
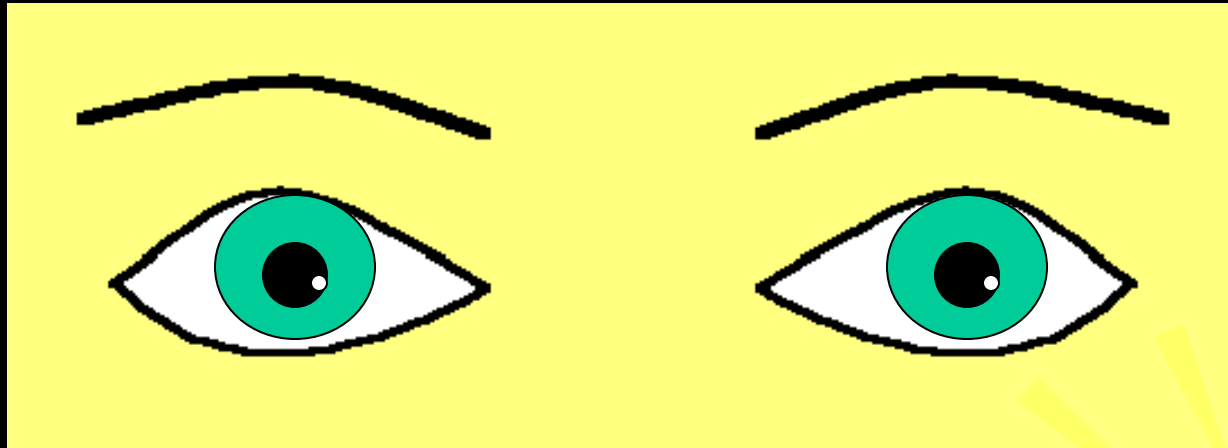


Direct response

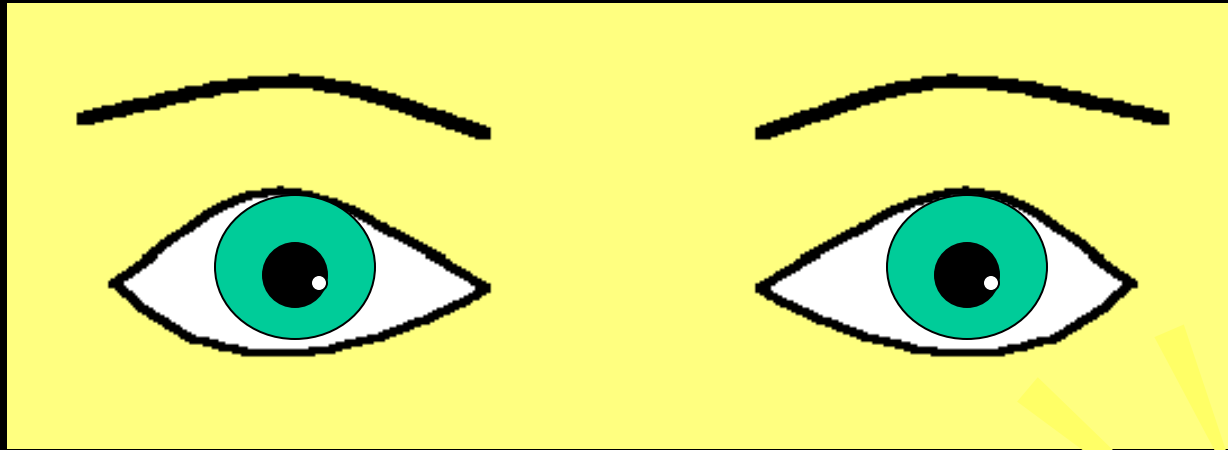


Consensual response

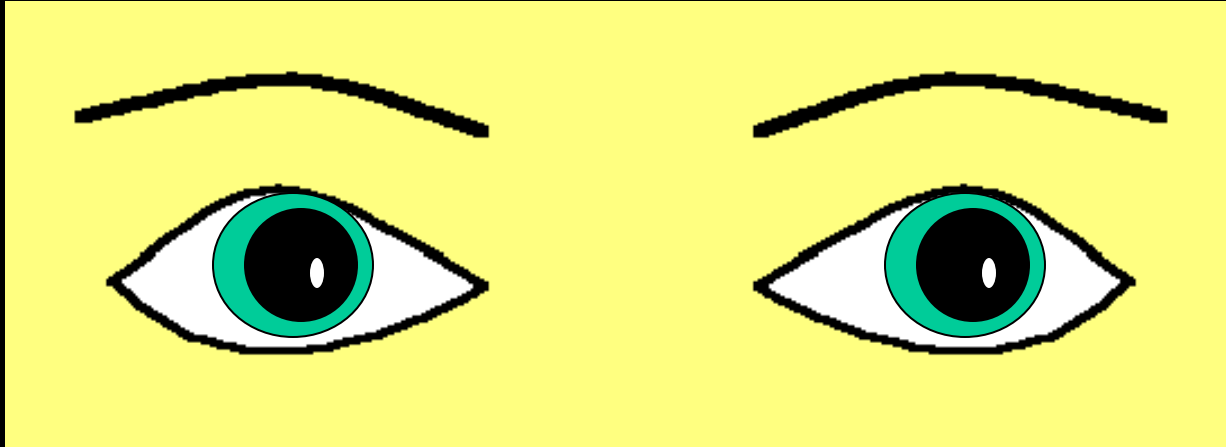




Direct

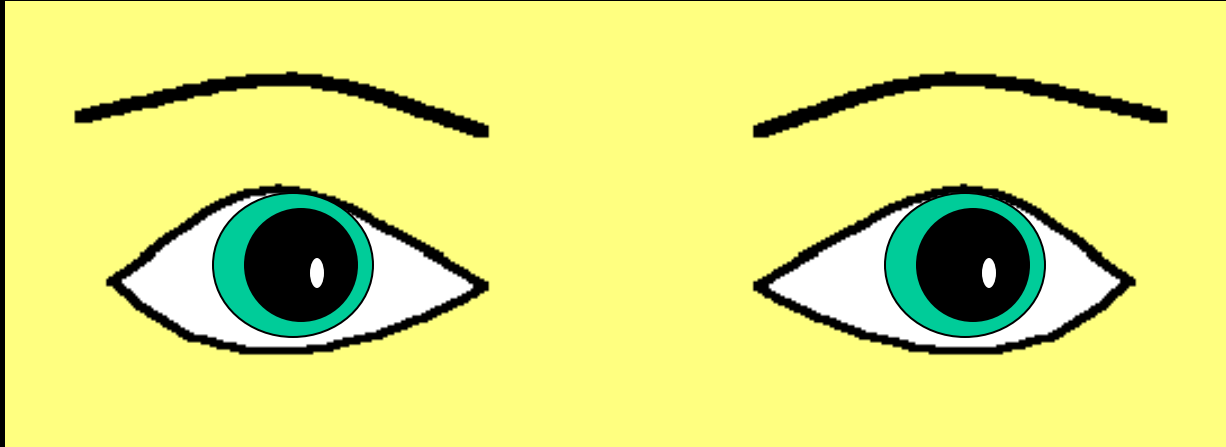


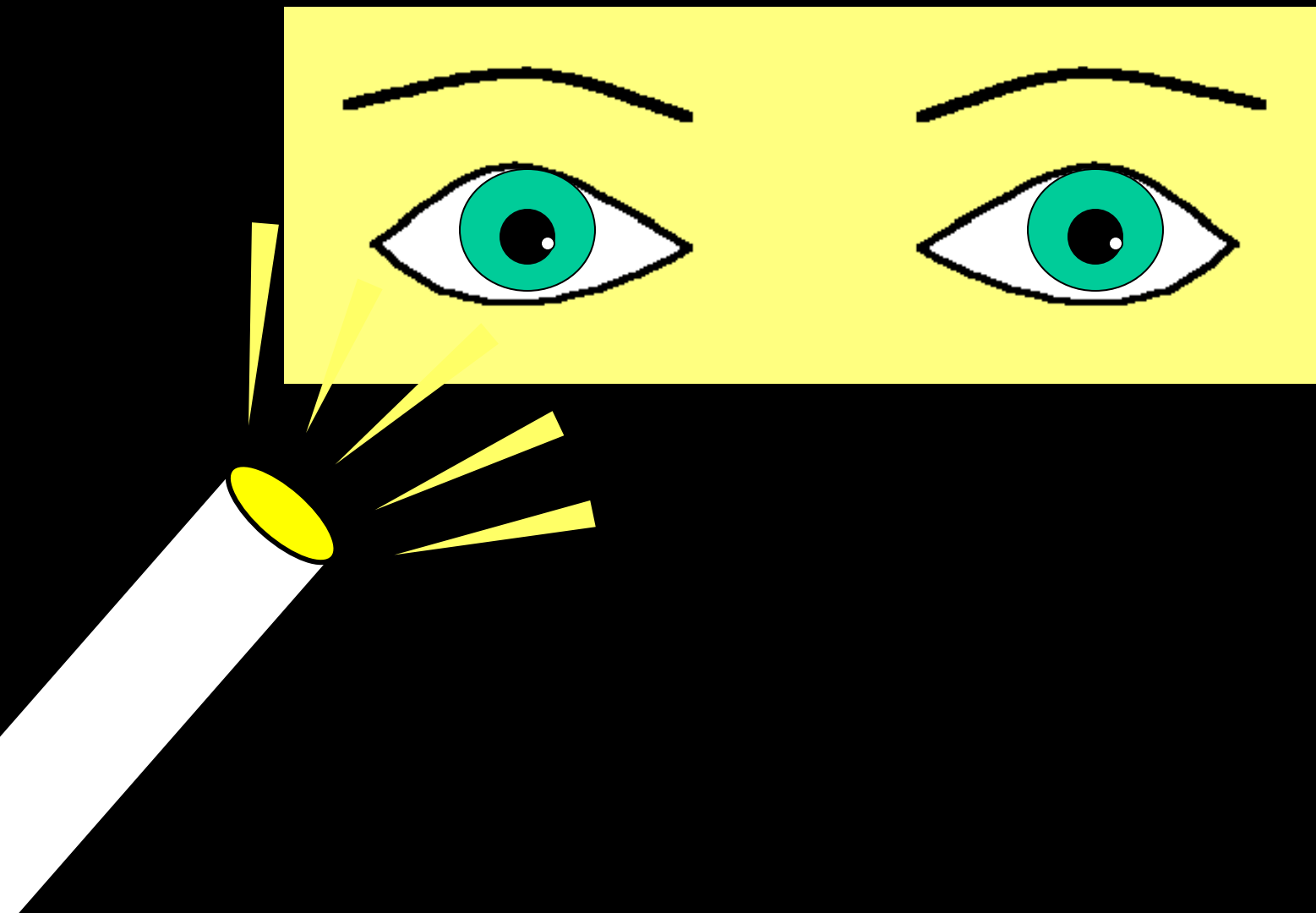
Consensual response

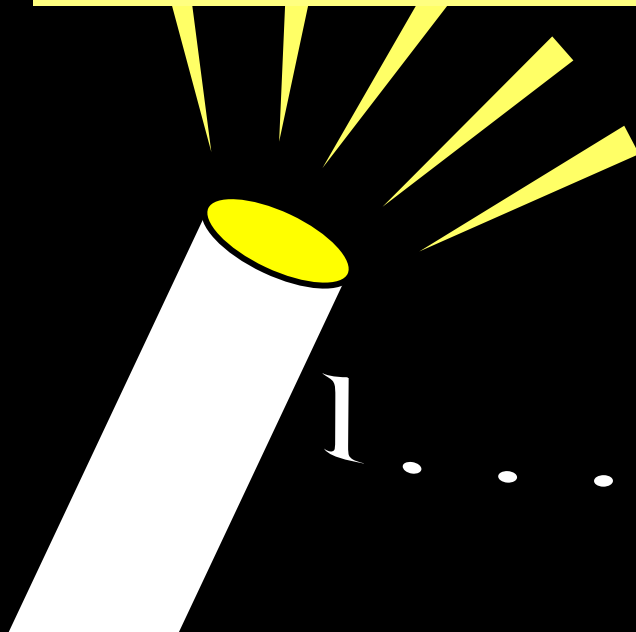
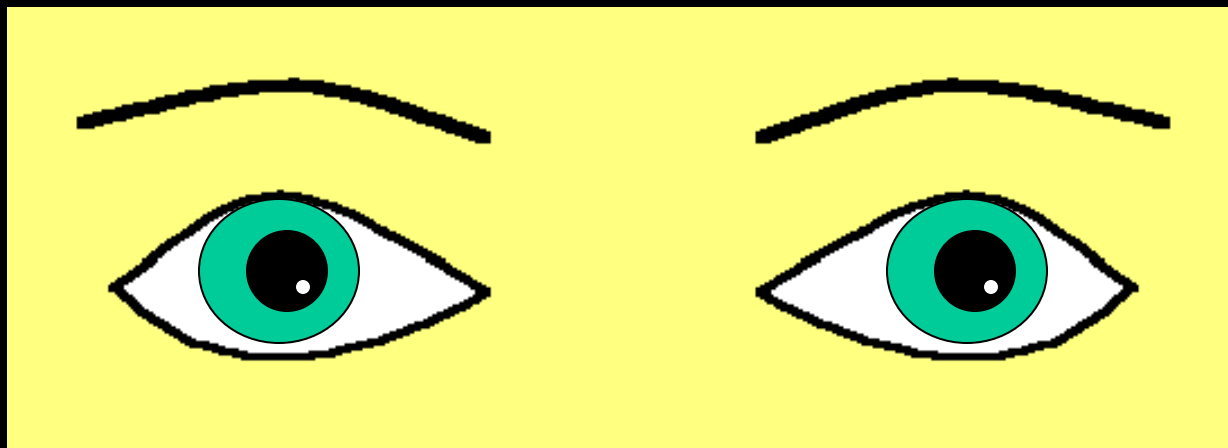


Swinging Flashlight Test

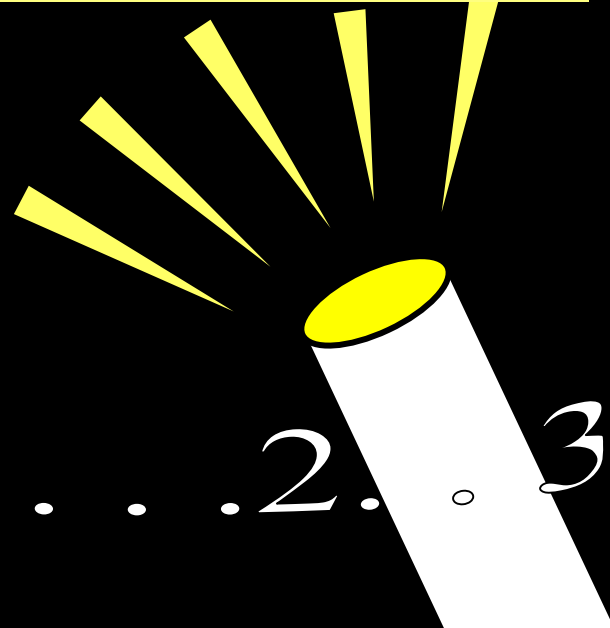
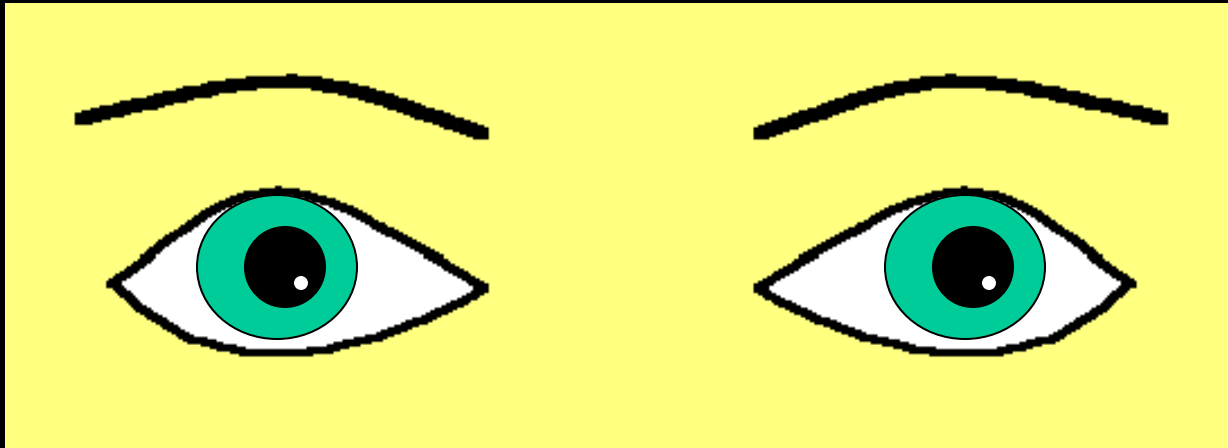
Normal



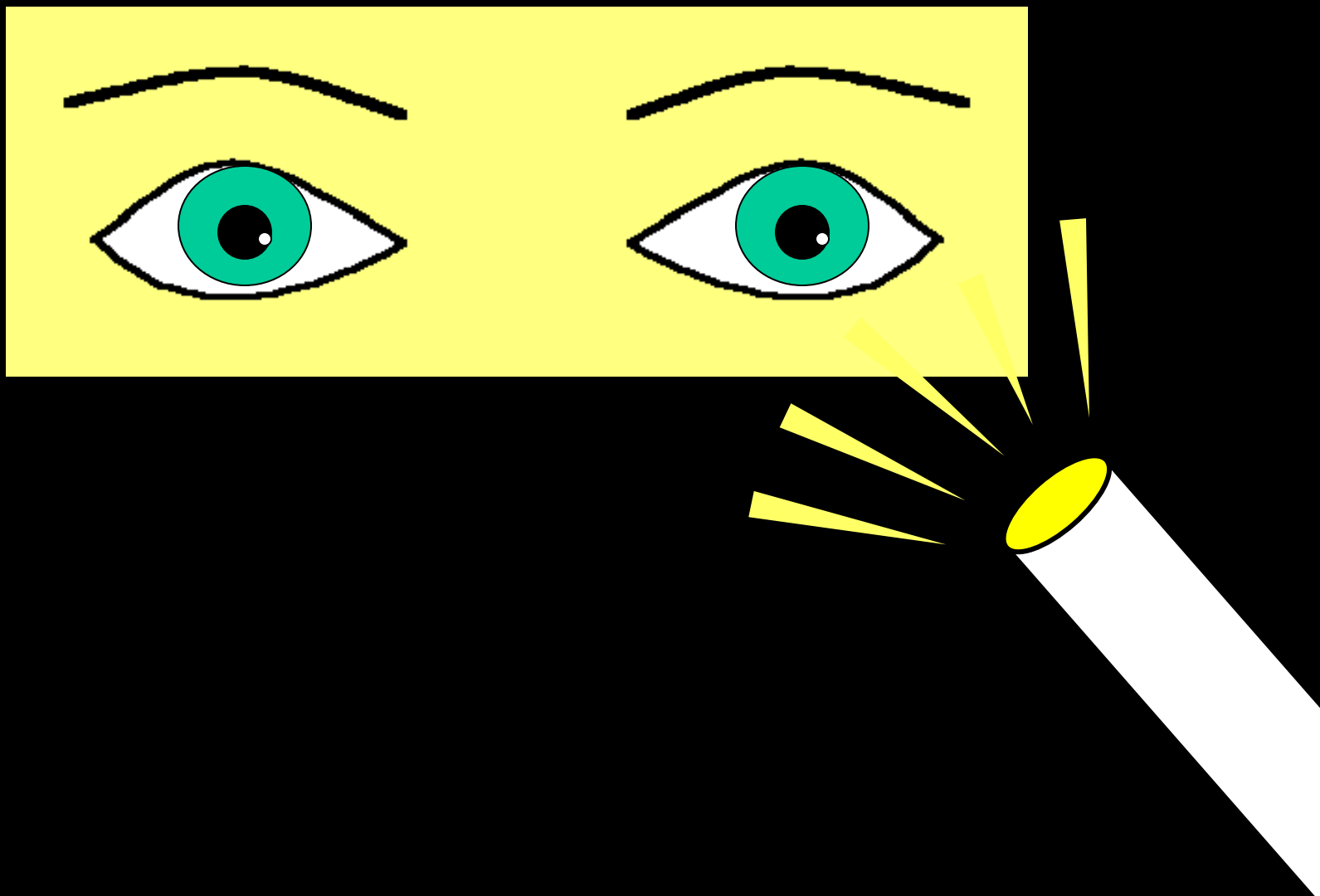


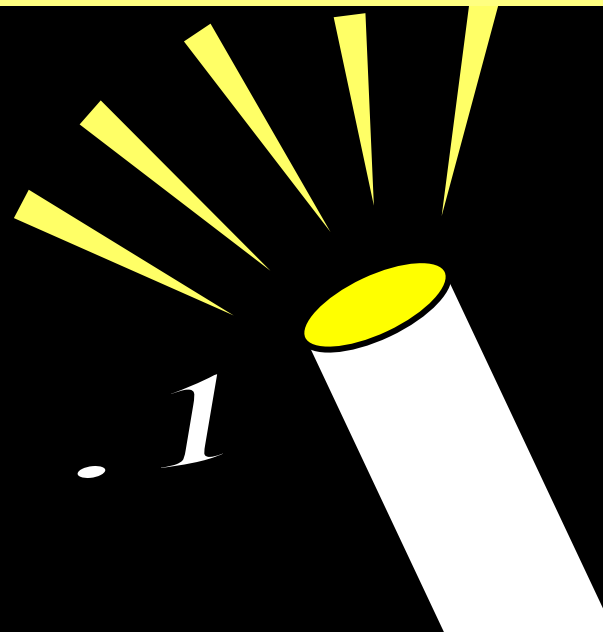
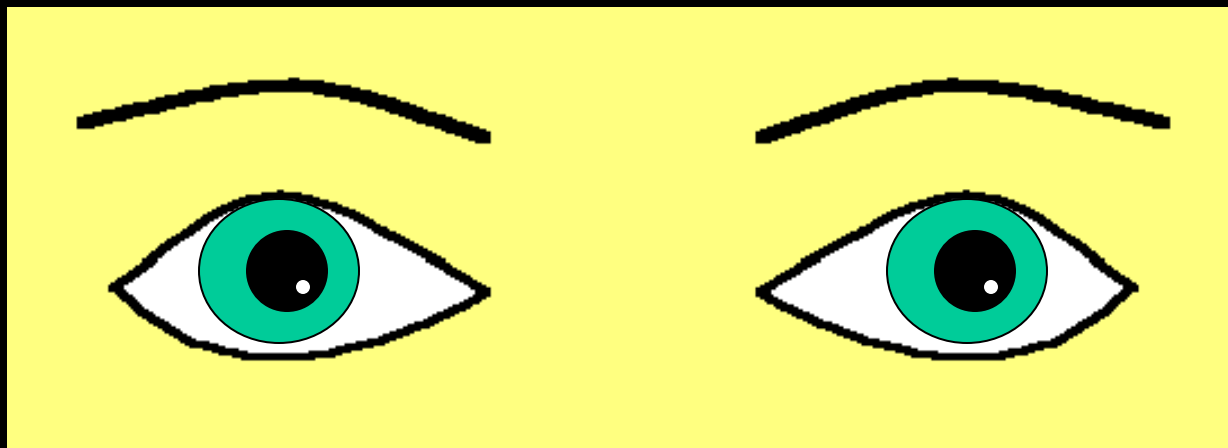


1.....2

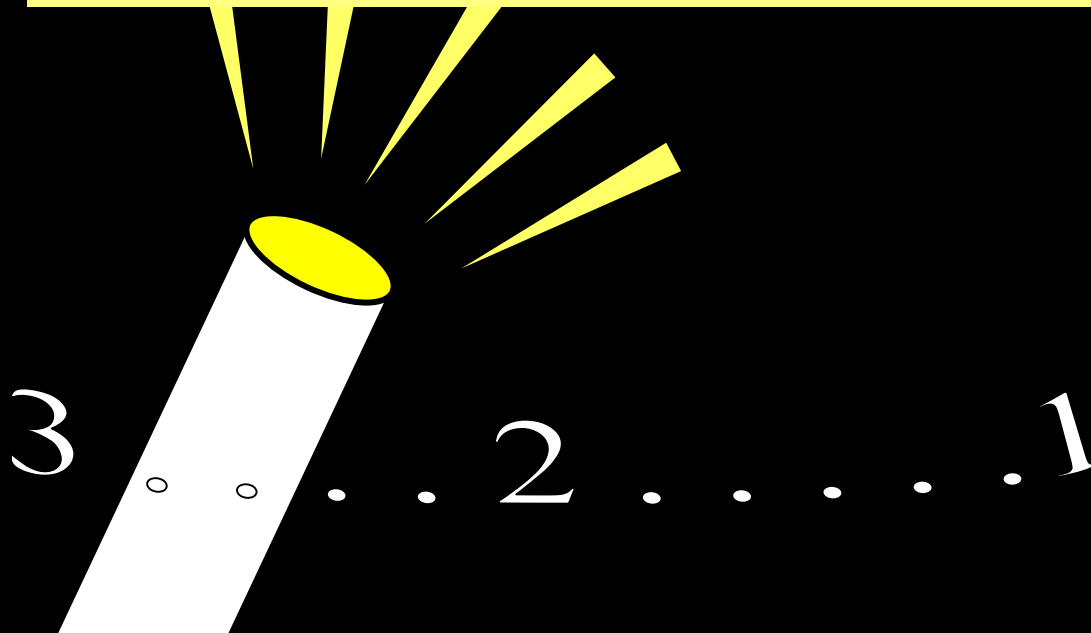
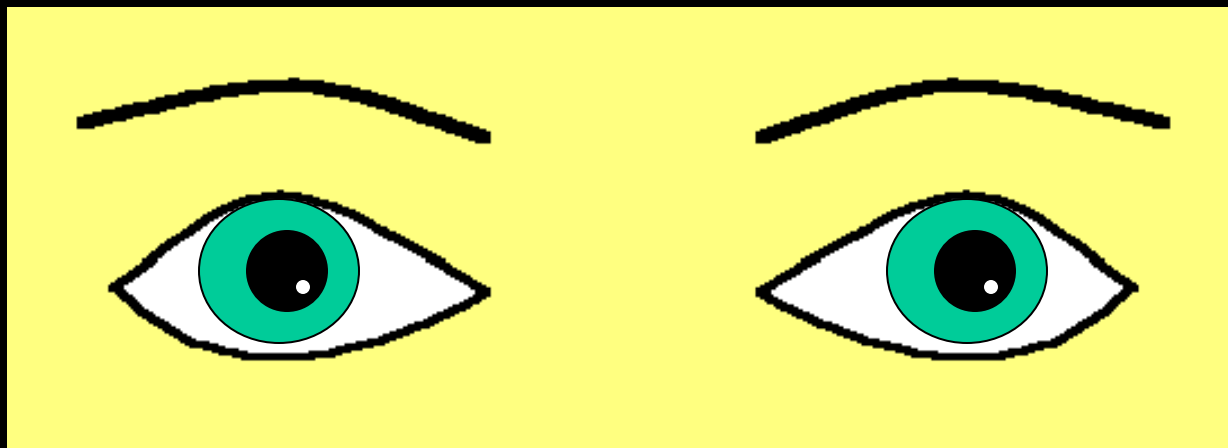


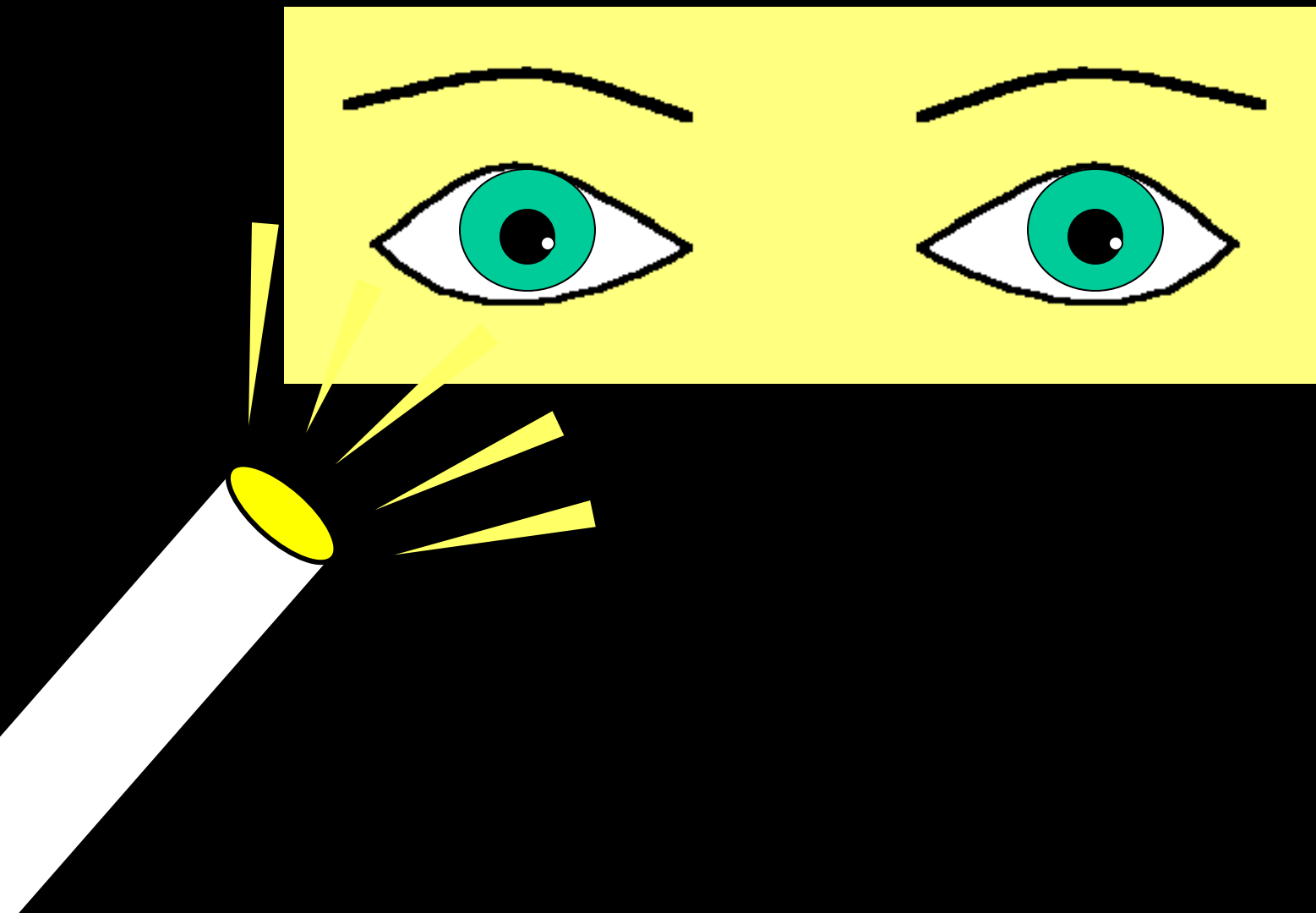
1 2 . 3

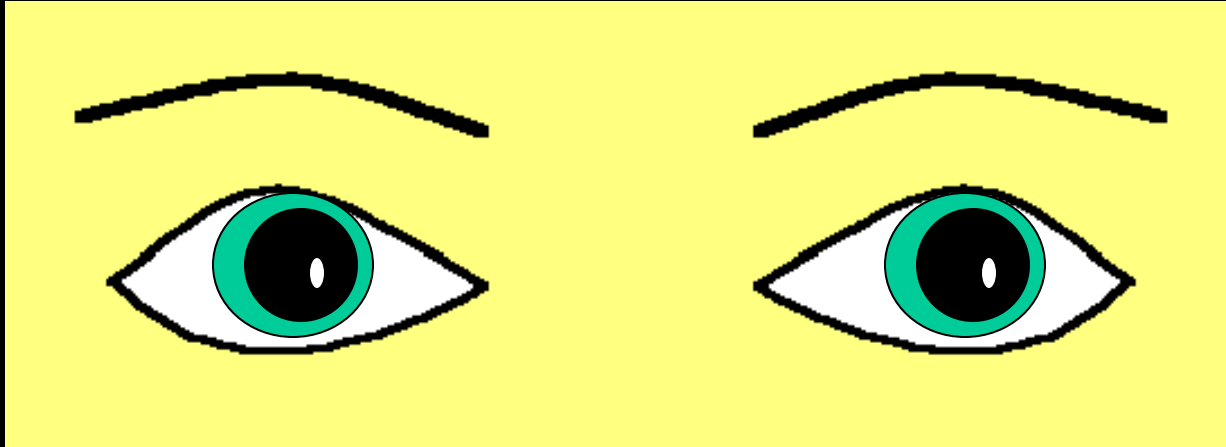




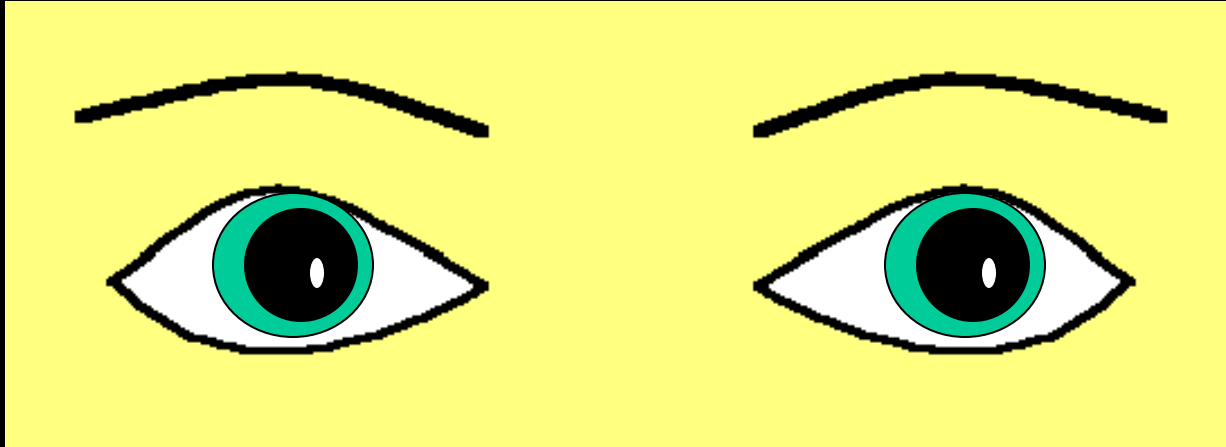
.....1

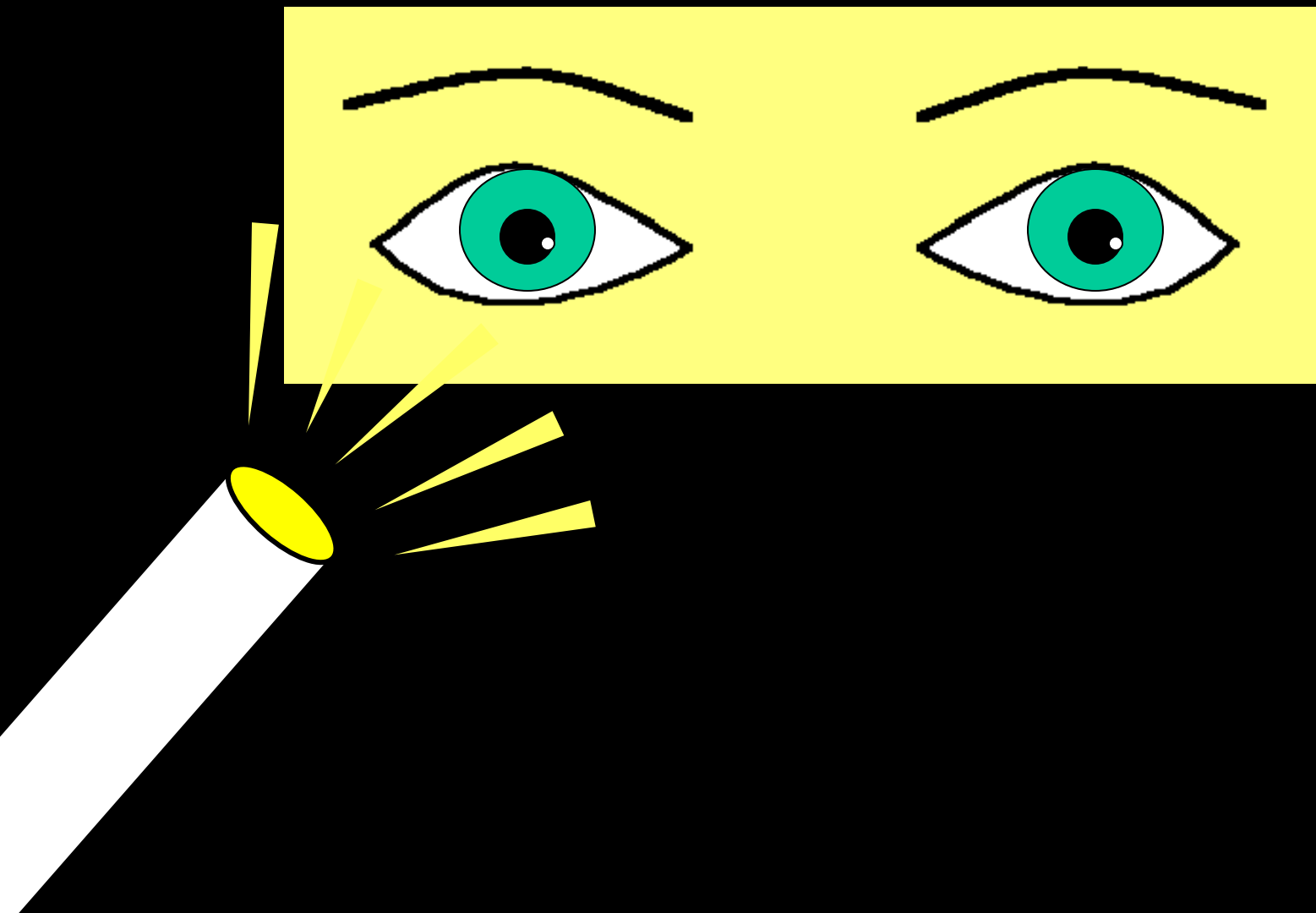


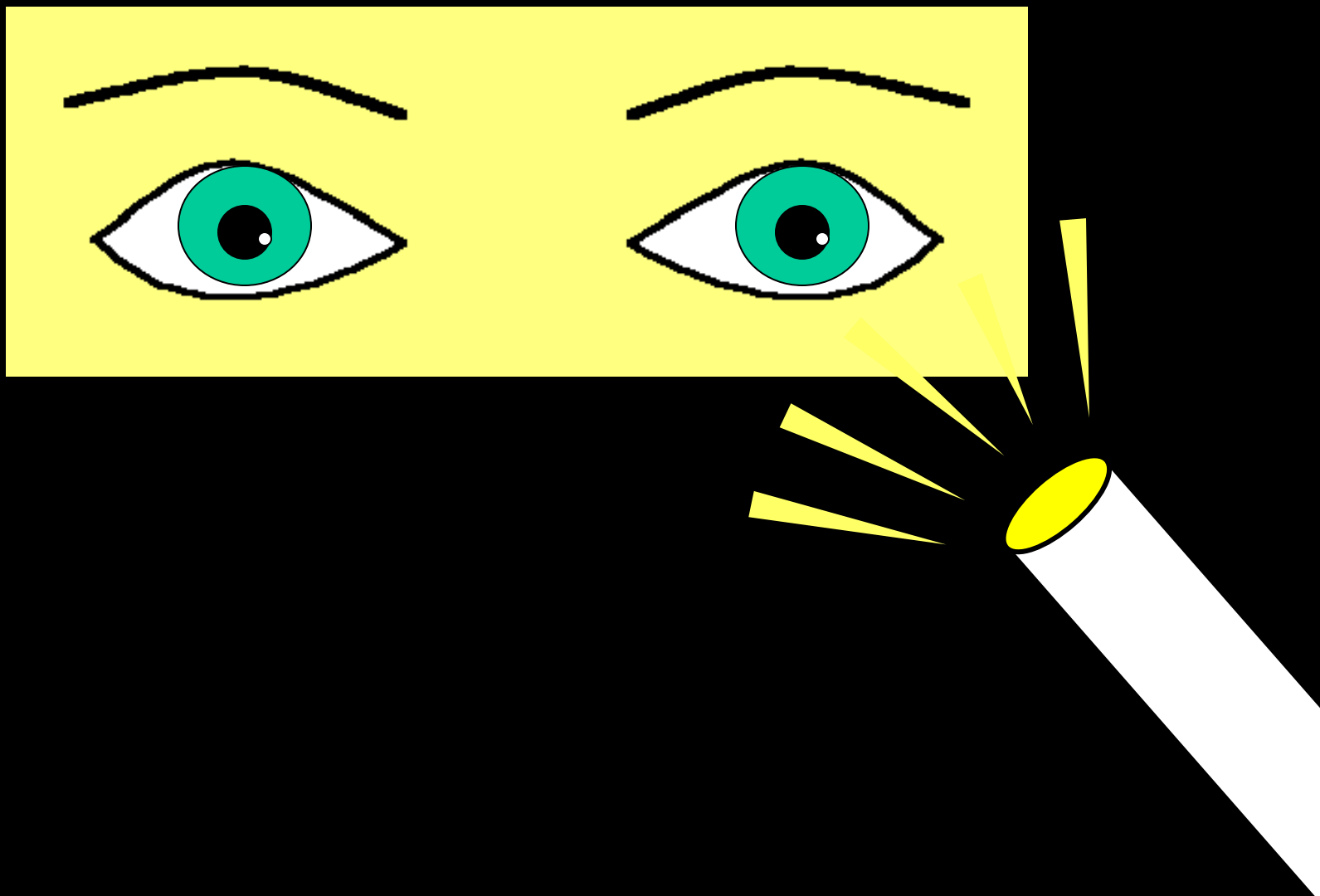


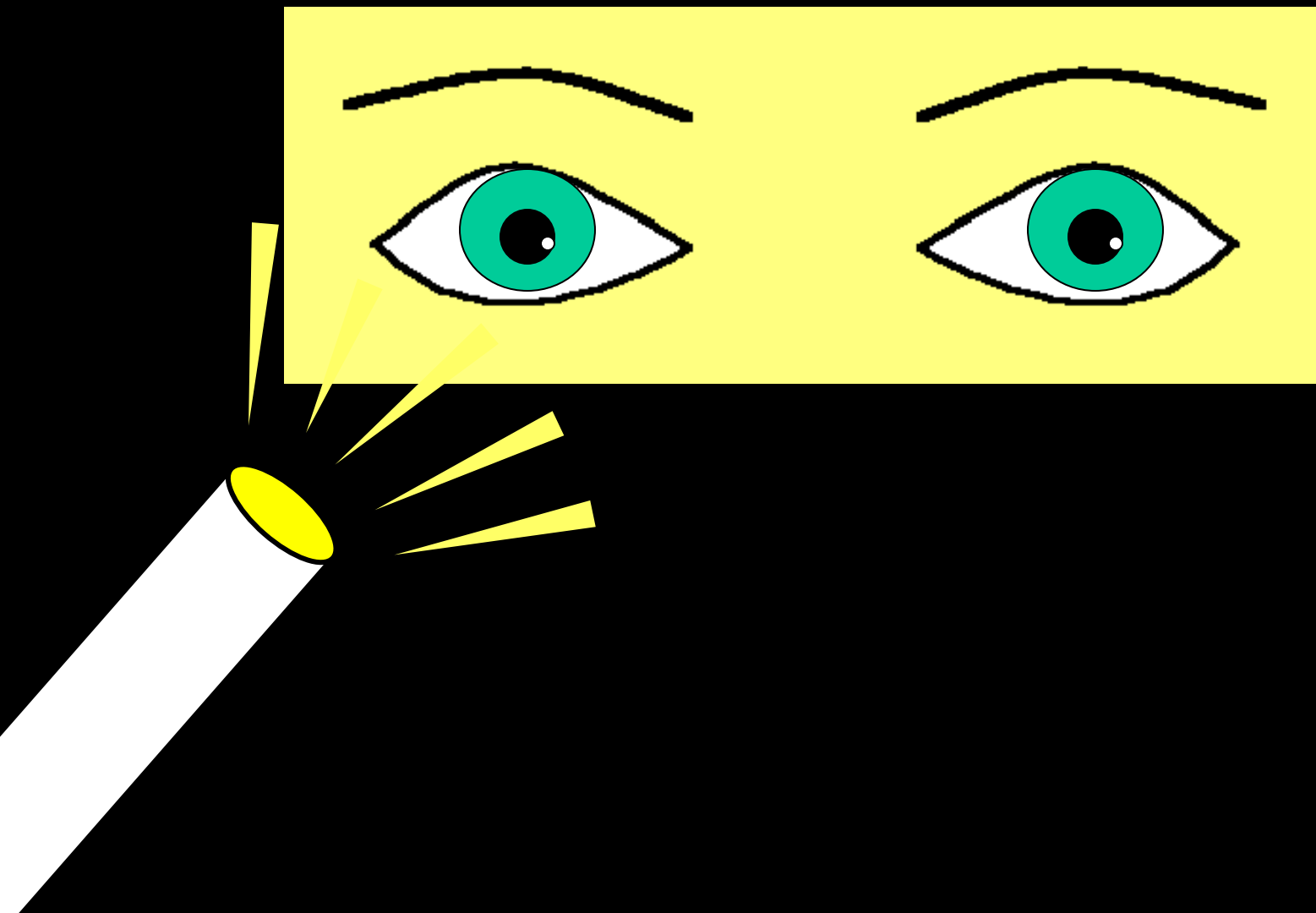


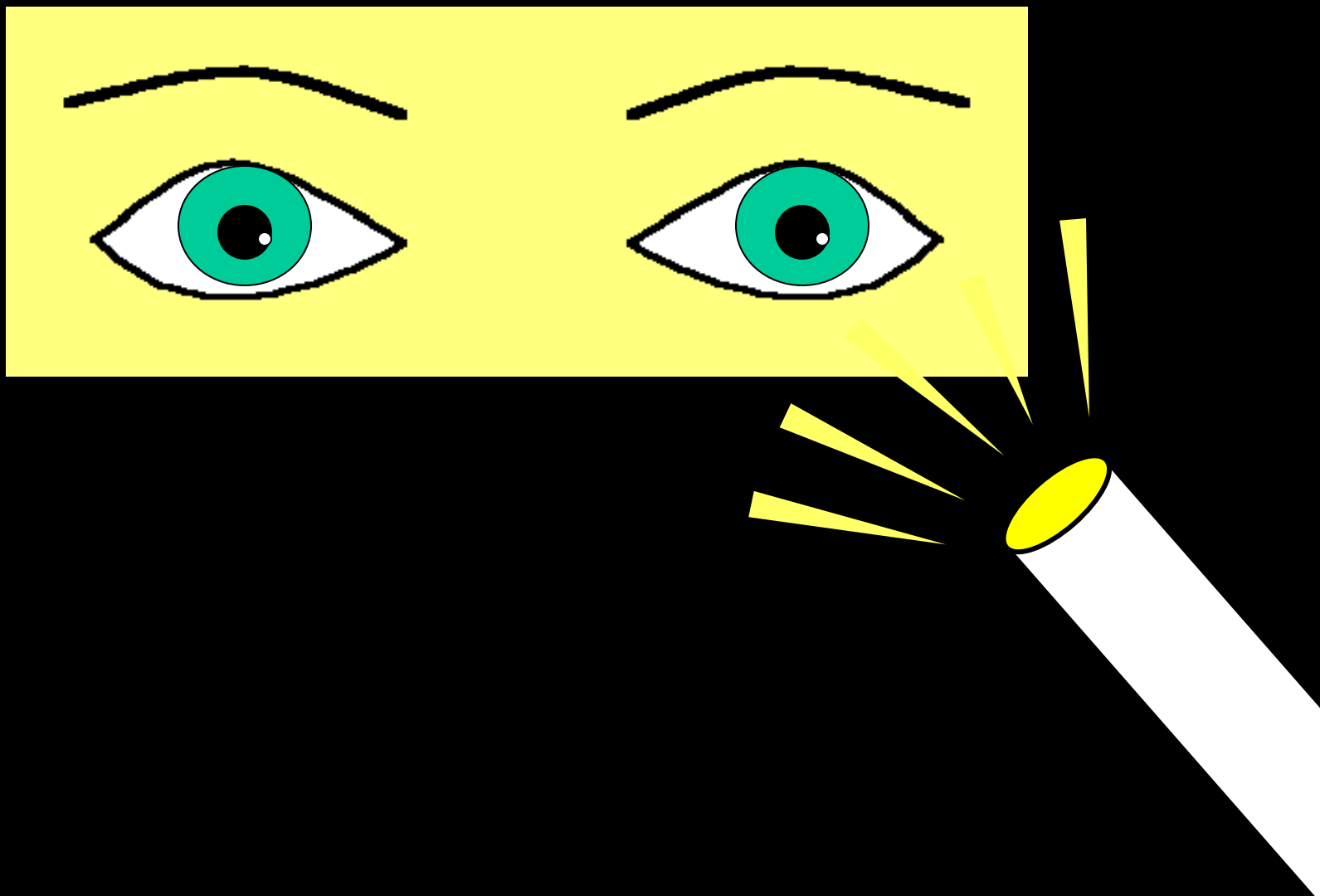
If done quickly.....

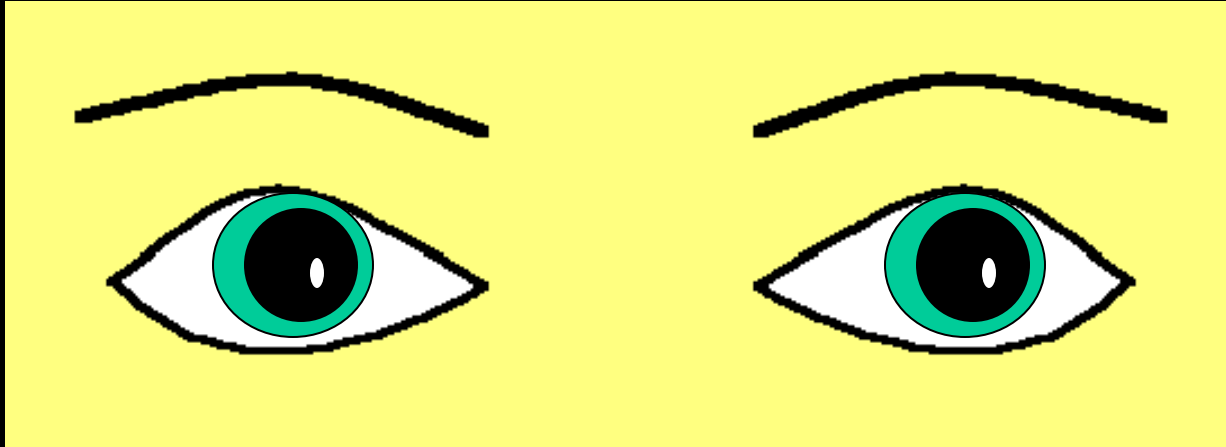






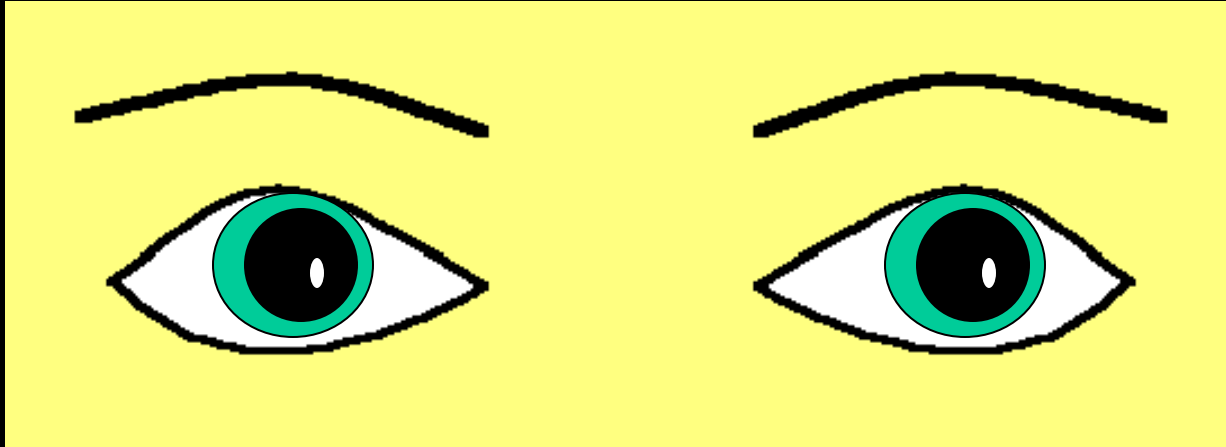


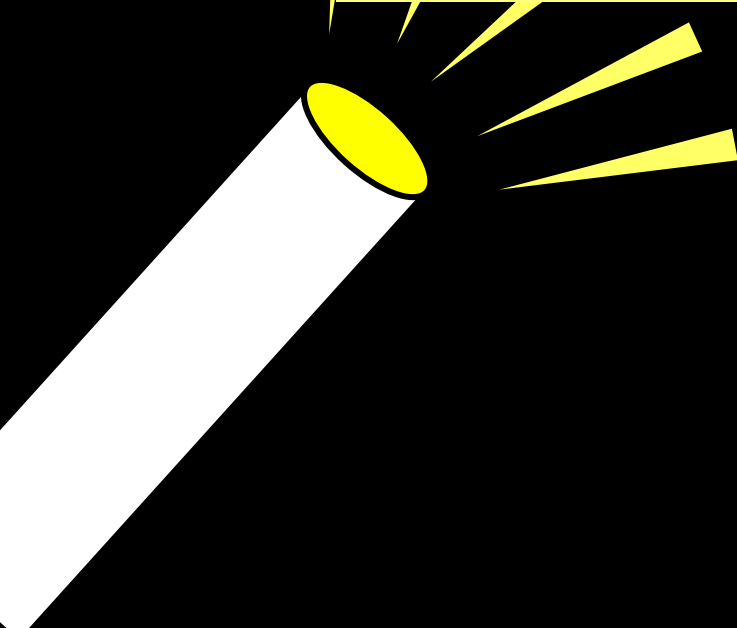
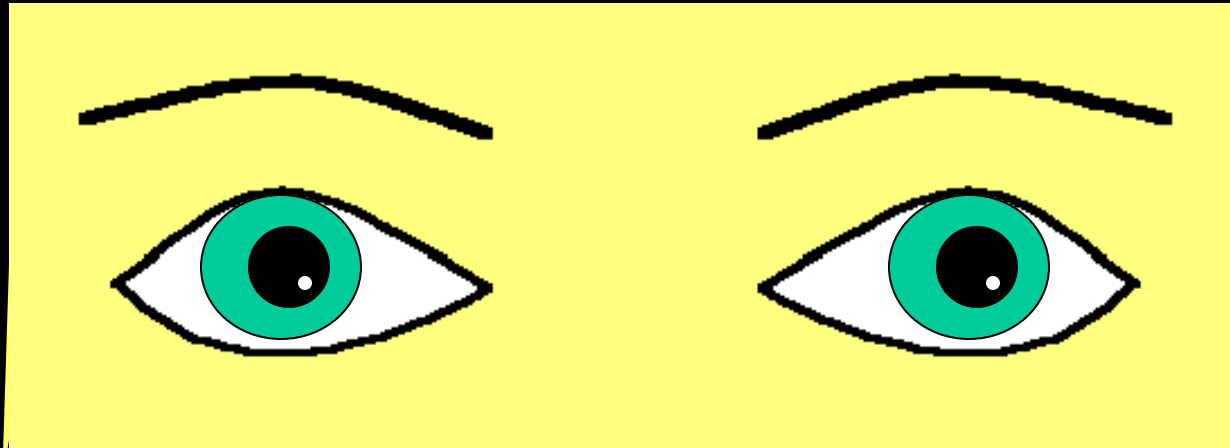




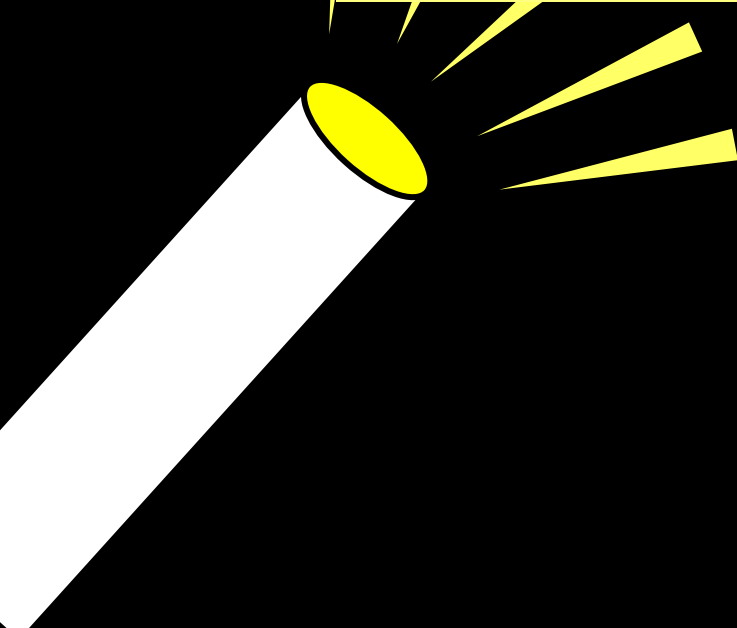
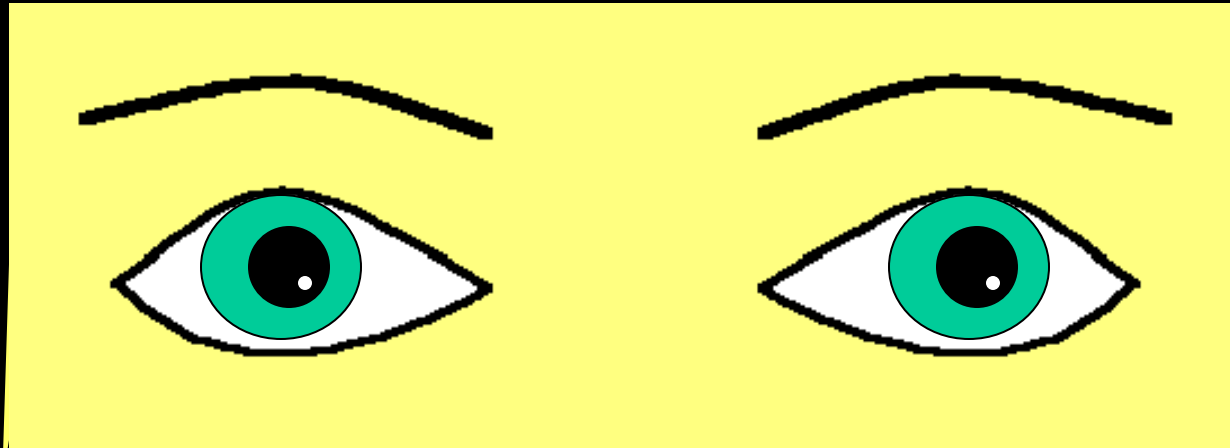
Right Relative Afferent
Pupil Defect

(RAPD)

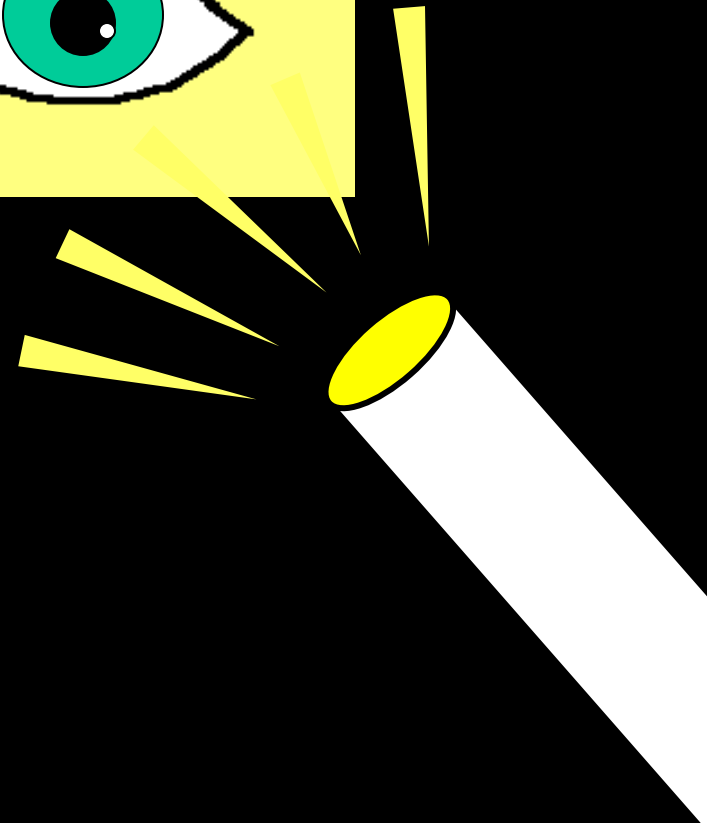
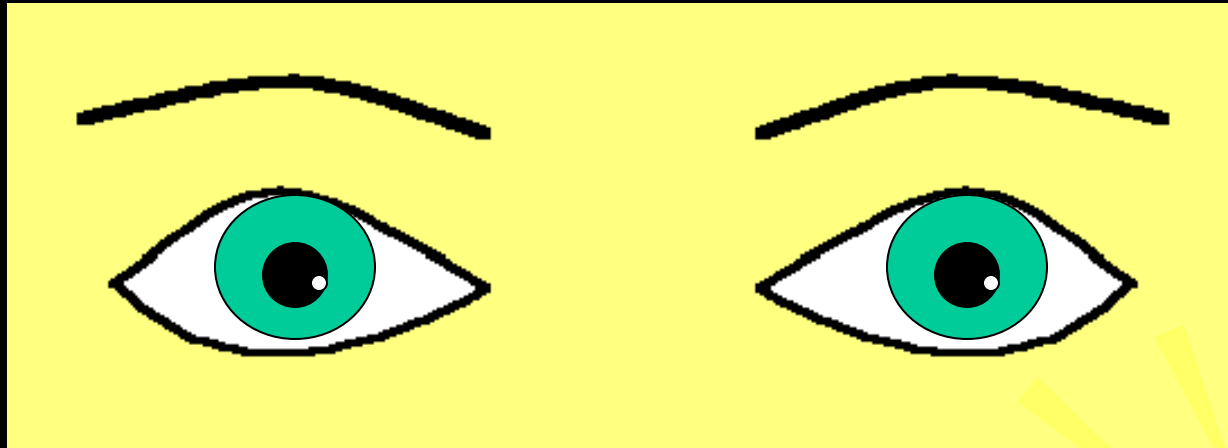




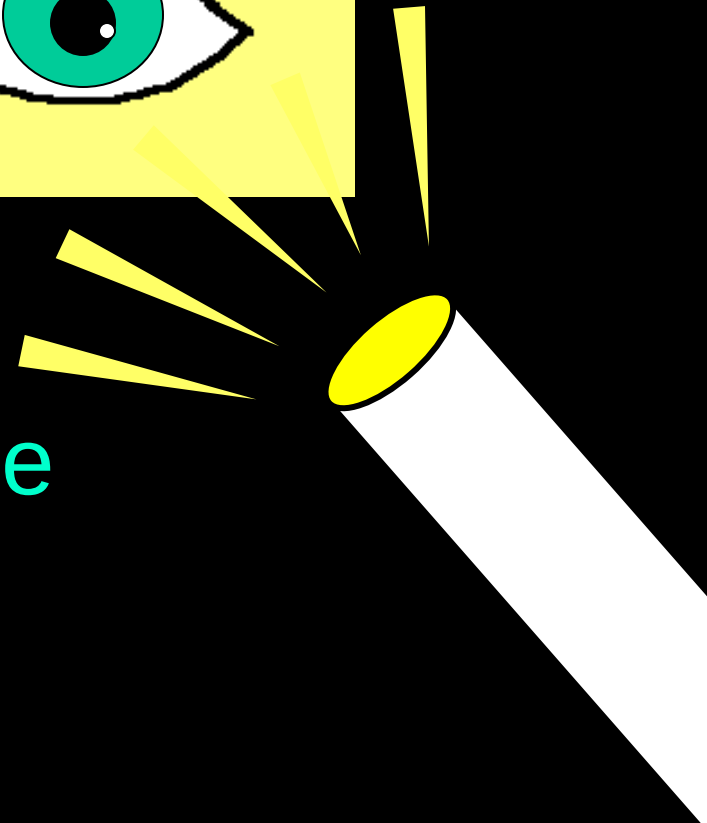
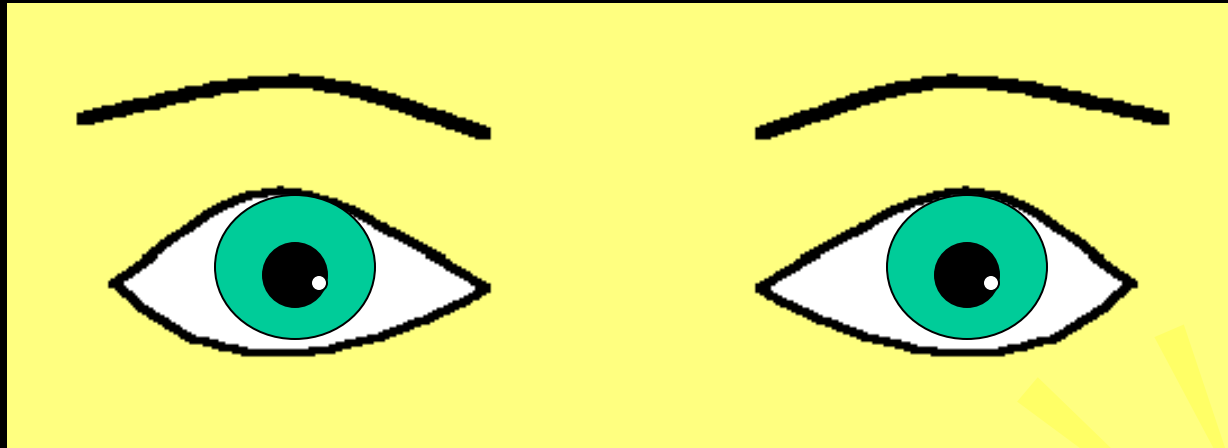
Direct response



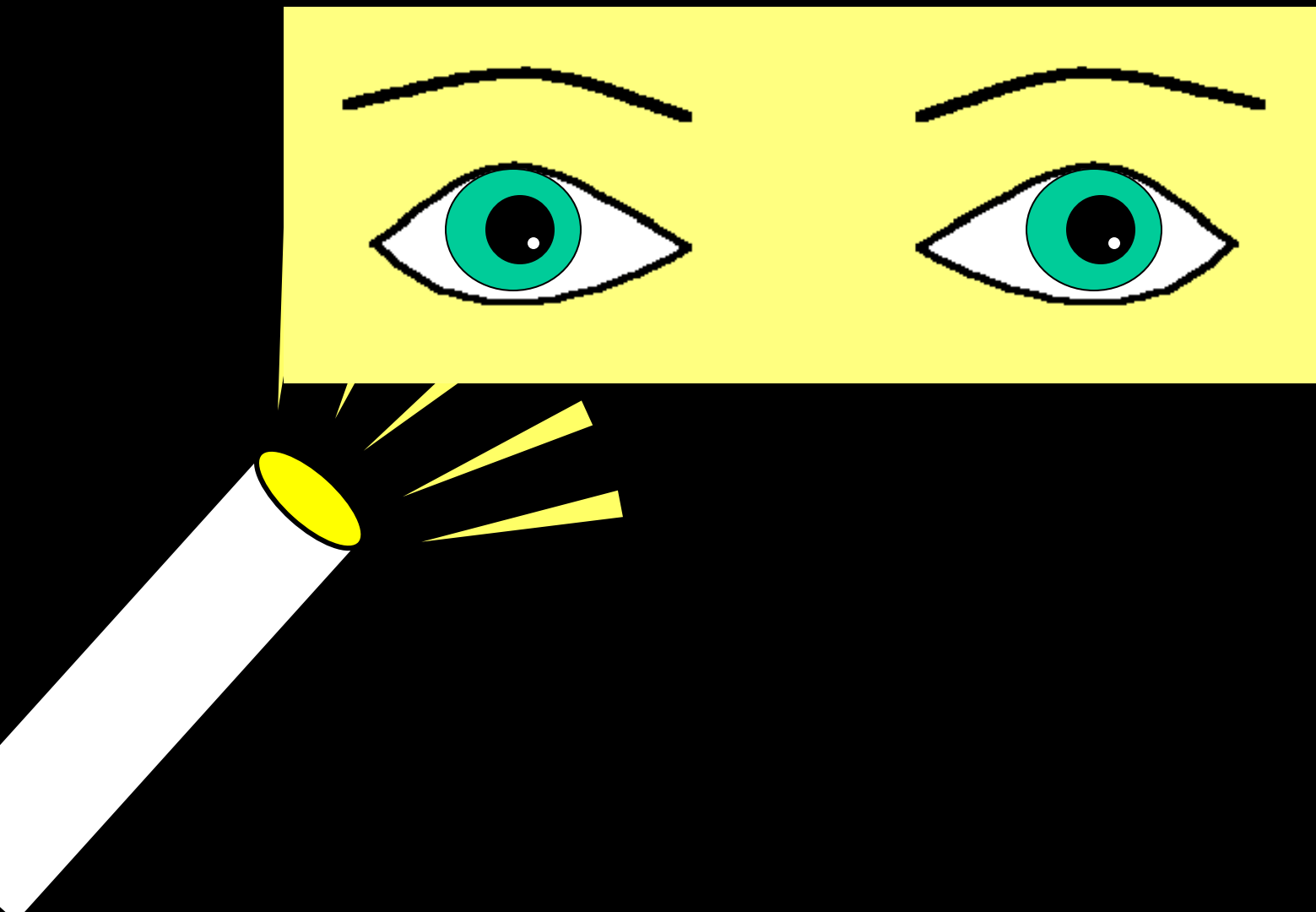
Consensual response

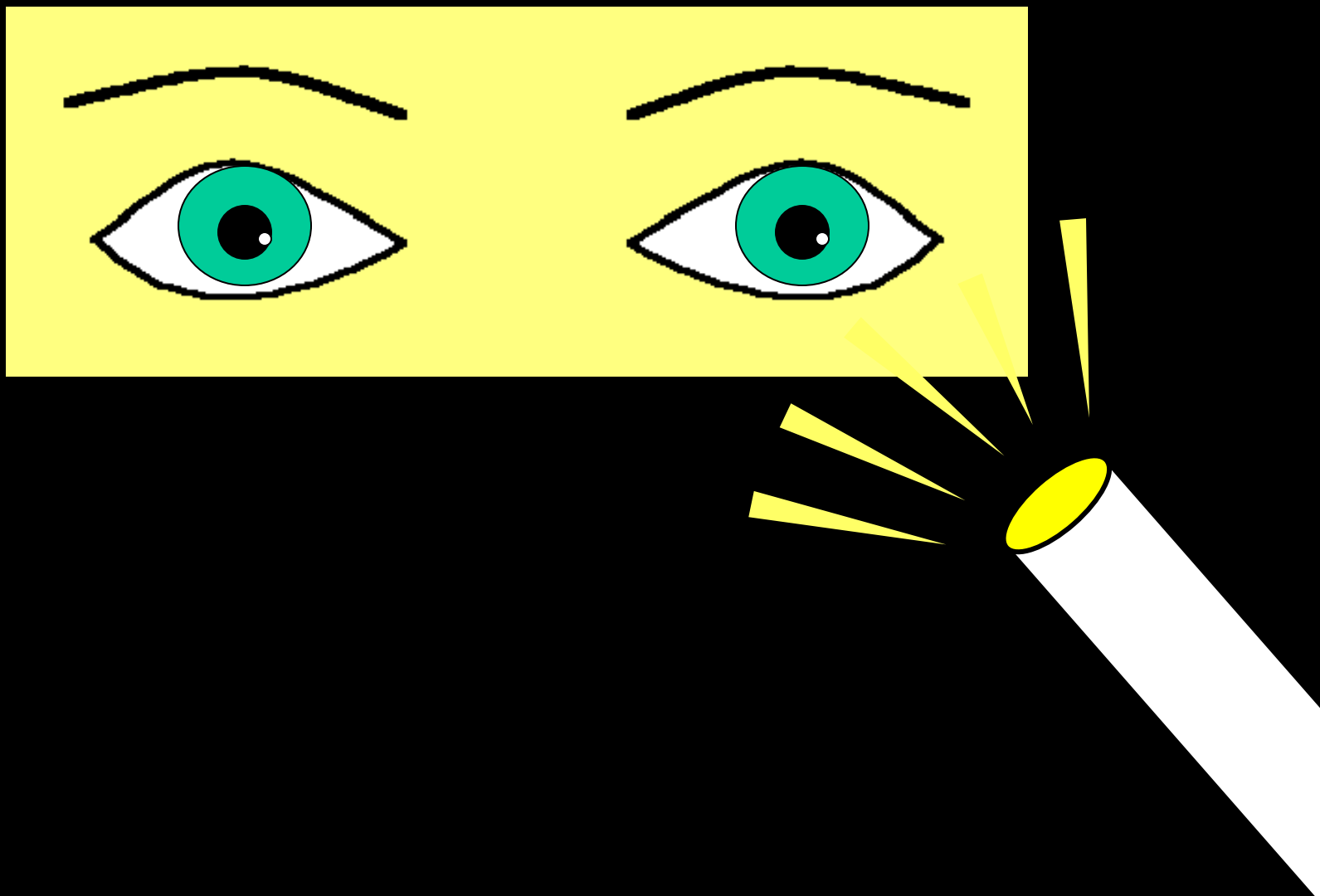


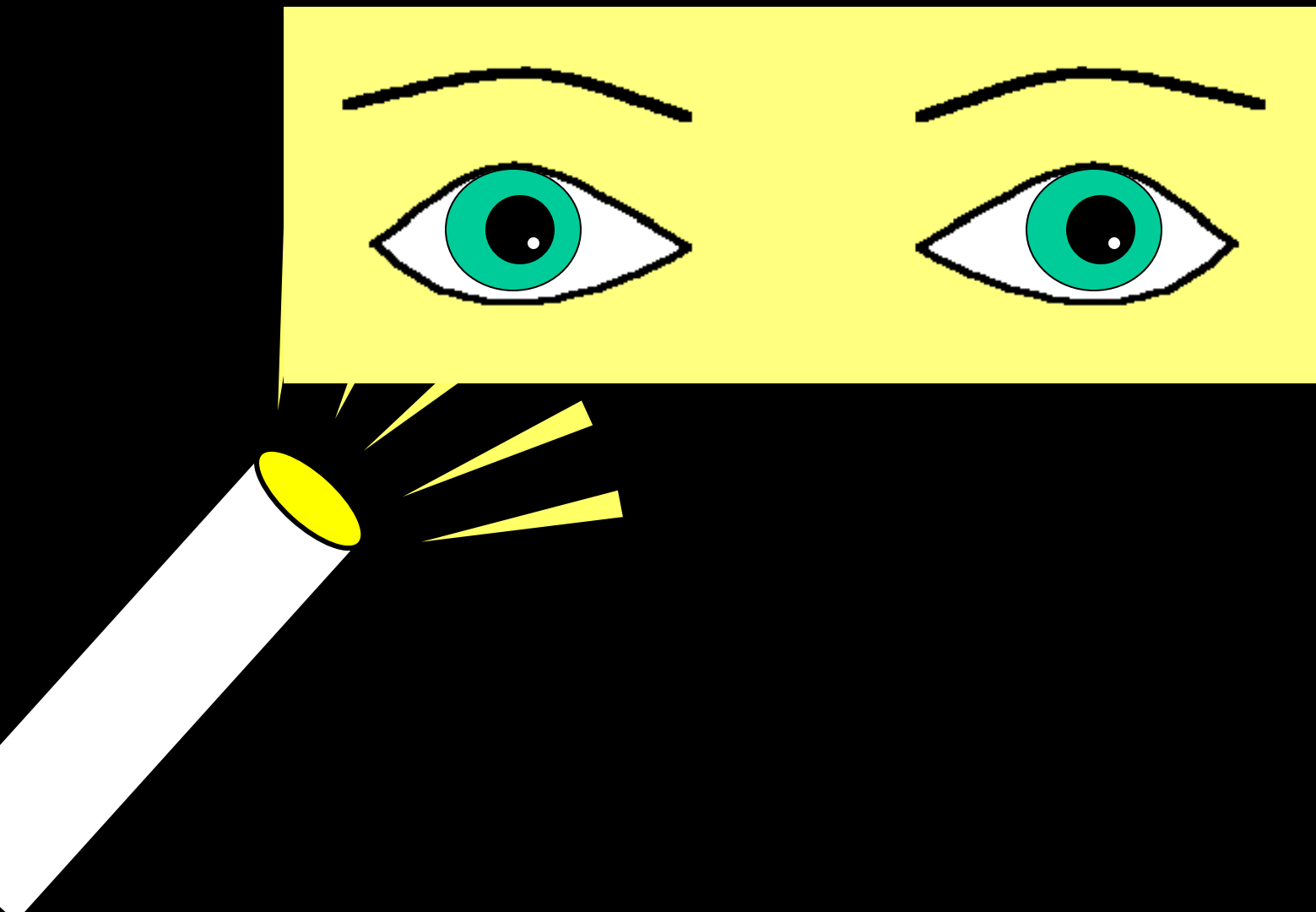
Direct response

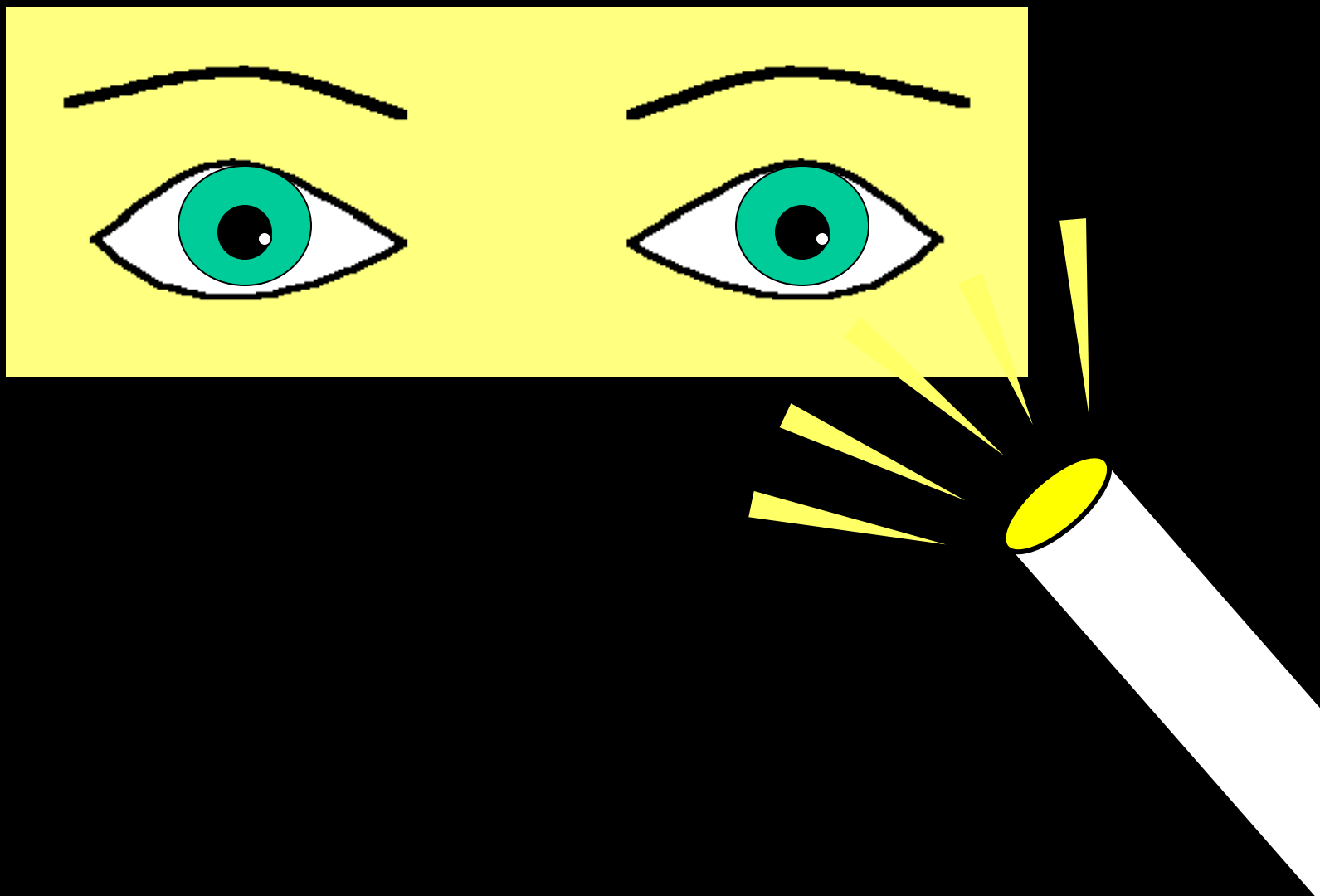


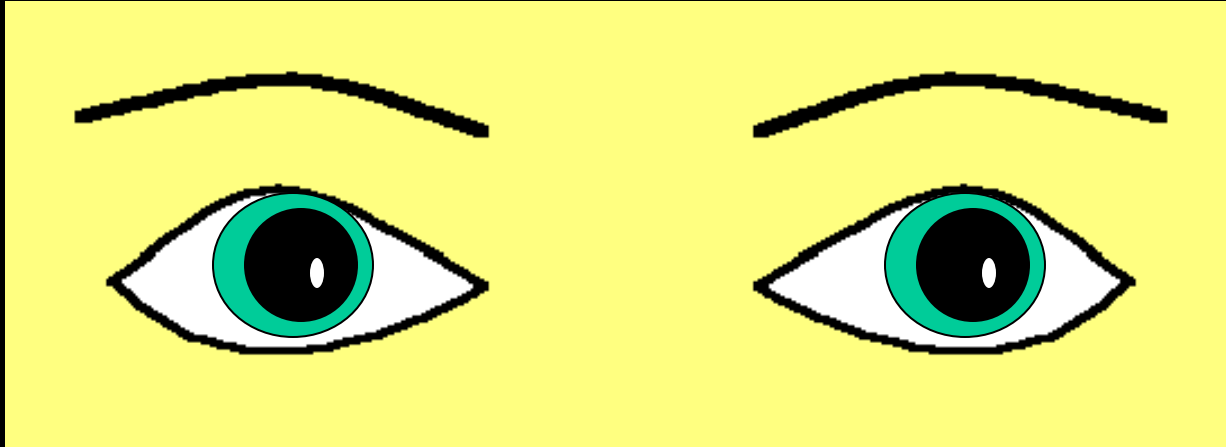
Consensual response

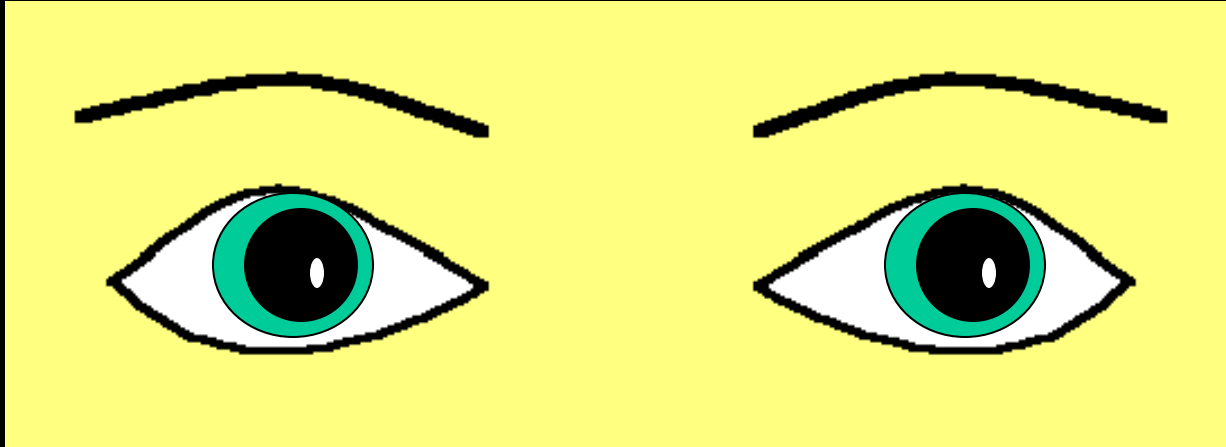












Summary: Relative Afferent Pupillary Defect

The swinging flash light test

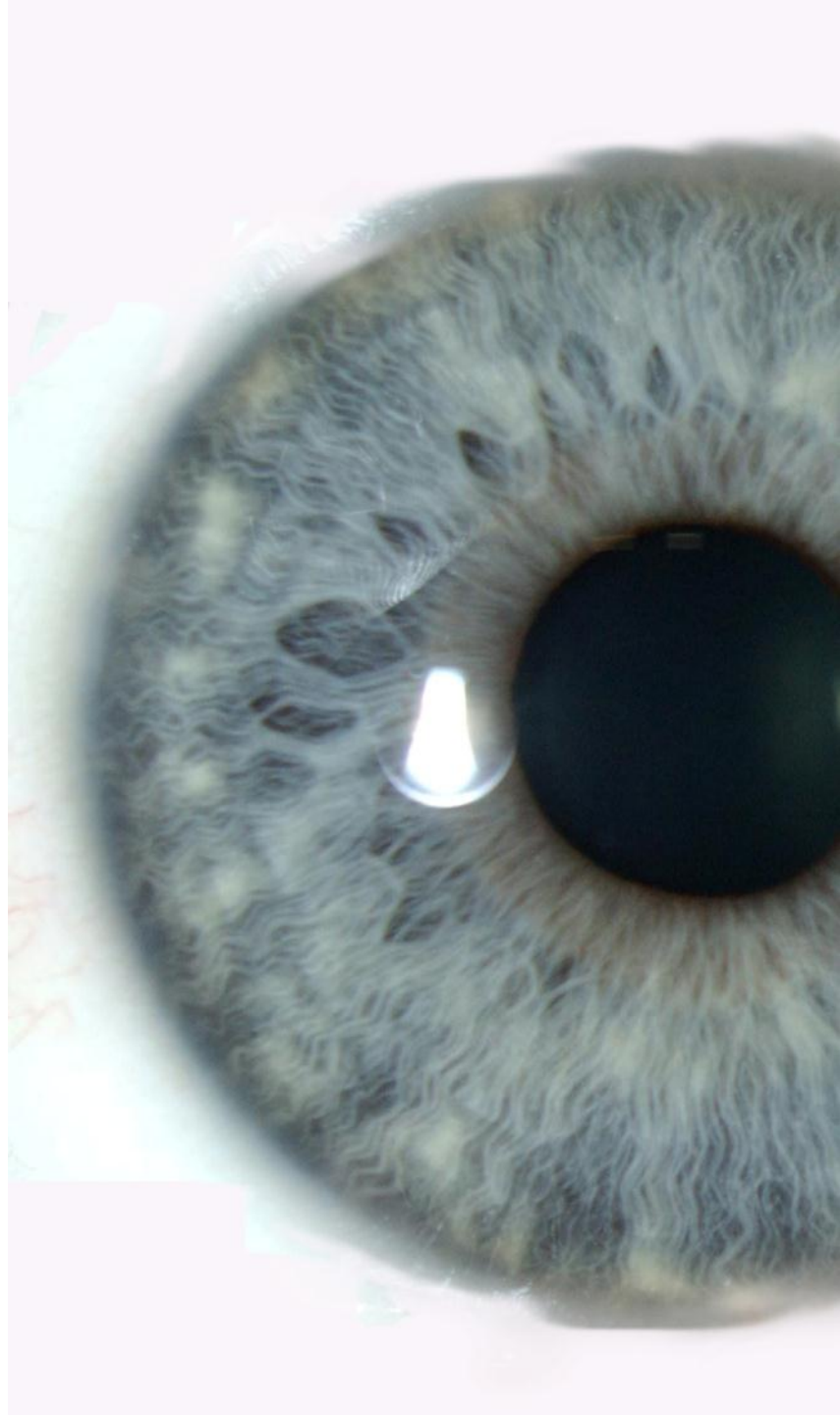
- Compares the reaction of one pupil to the other
- Compares the health of one optic nerve to the other!

Key Points: RAPD

Objective finding.

1. Strongly suggests optic neuropathy.
2. RAPD will only be present in unilateral or asymmetric bilateral disease.
3. Can be assessed with one working pupil.

Near response of pupils



The Near response

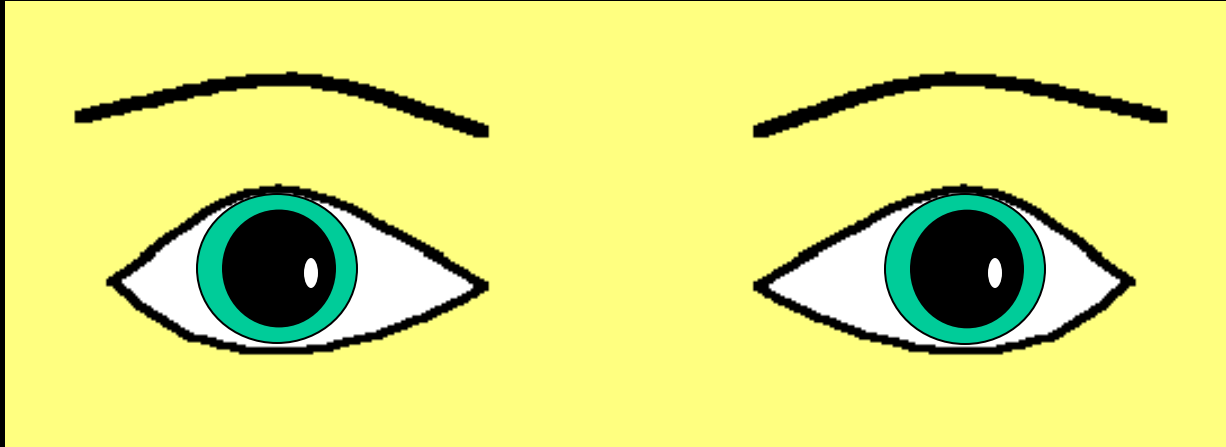
Consists of the triad of:

Accommodation

Convergence

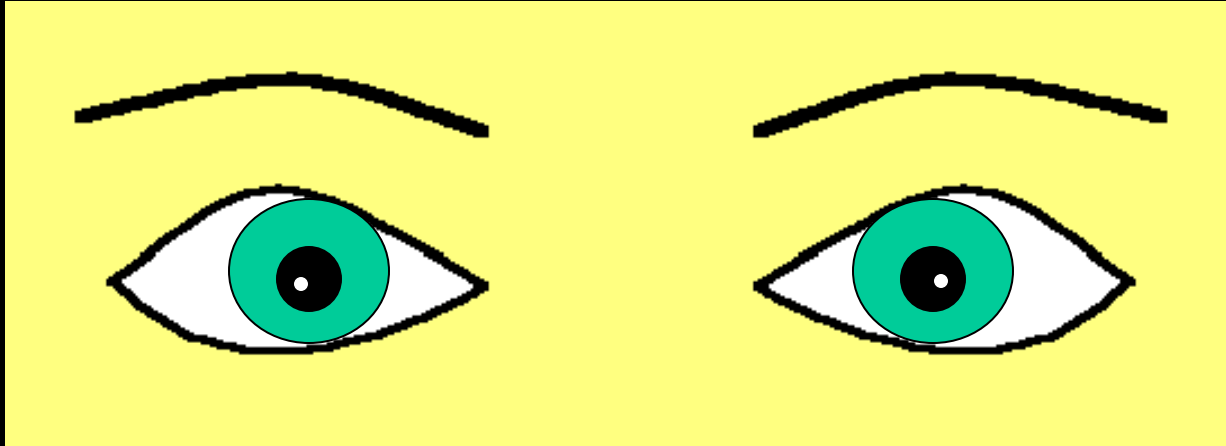
Constriction/miosis





Looking in the distance

now on looking at a near target...

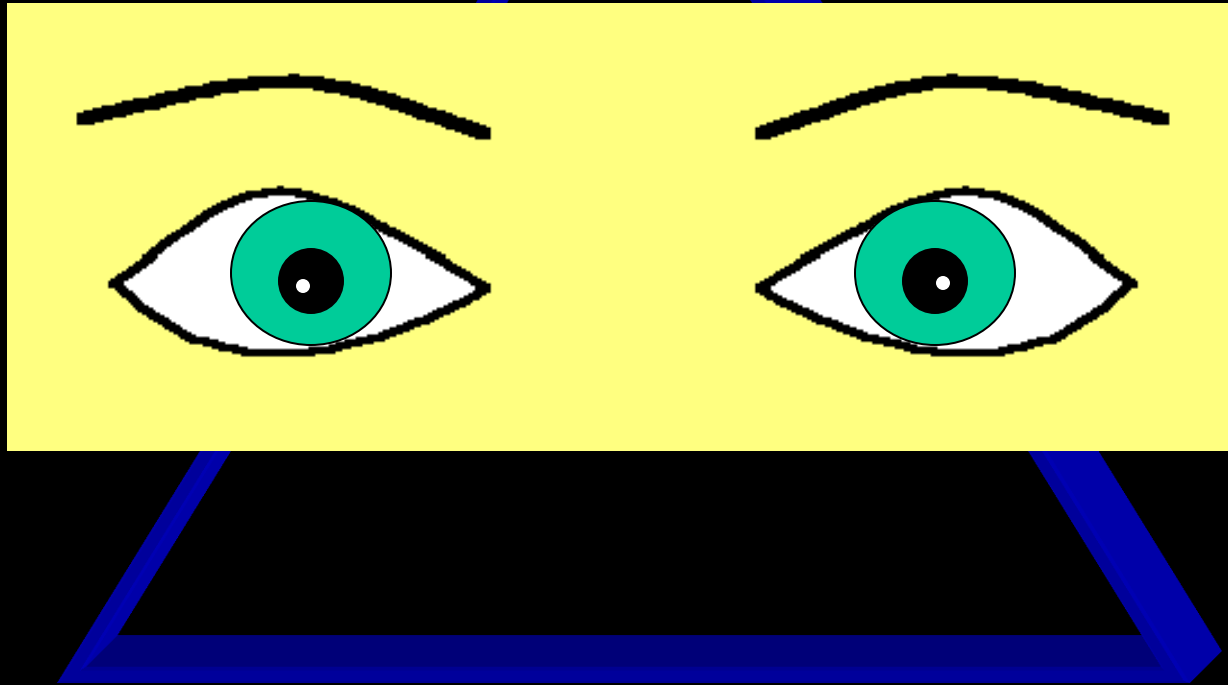


Accommodation is exerted.

the eyes converge

the pupils constrict / miose

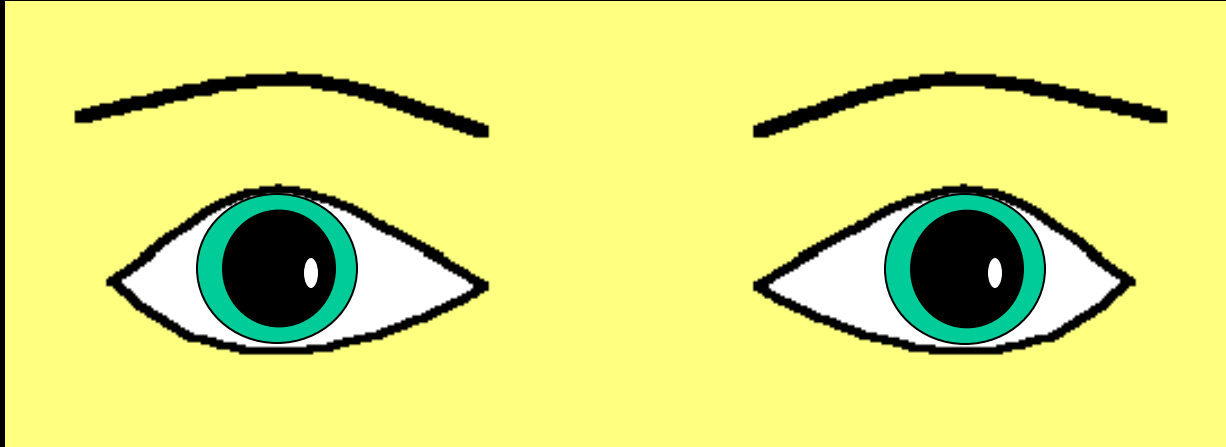
Accommodation is exerted



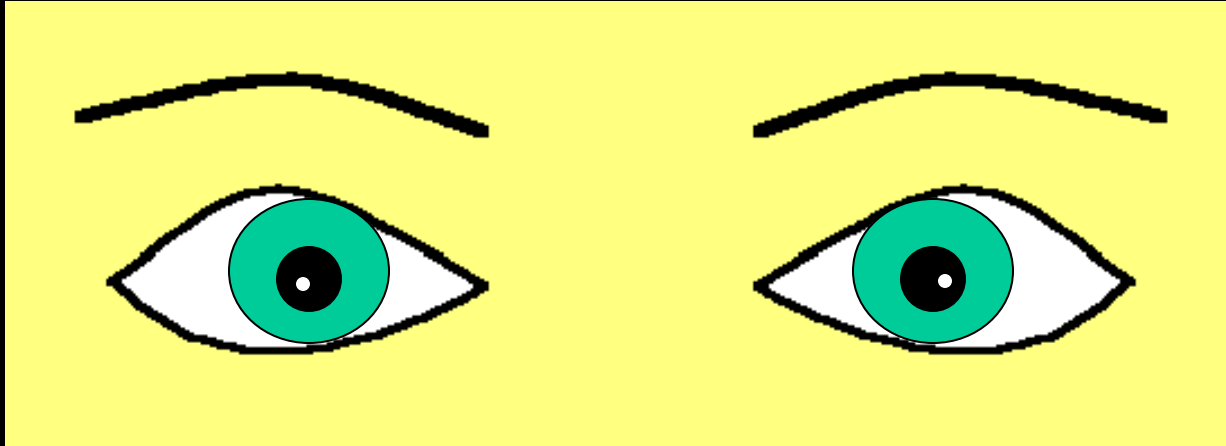
the eyes converge

the pupils miose

And again..



Looking in the distance



And near.

Illustrative Case



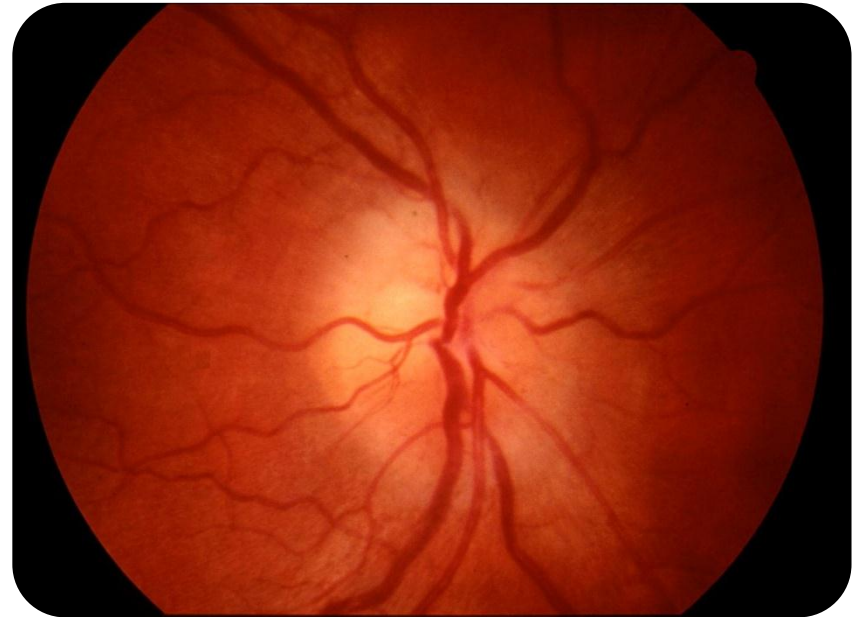
27 year old female school teacher
10 day history of vague ache around right eye
Feels vision a little blurred
No systemic symptoms

Examination

	<u>Right</u>	<u>Left</u>
Visual acuity	6/7.5	6/5
Pinhole	6/7.5	6/5
Colour	Red desat'n	Red Normal
RAPD	++	normal
EOM	normal	normal
Fields	Full	Full

Diagnosis: Retrobulbar / optic neuritis

- Decreased VA
- Decreased colour vision
- Relative afferent defect
- No other signs



Basic eye movement tests

1. Corneal light reflection test

2. Cover test

3. Extra-ocular movements to a target

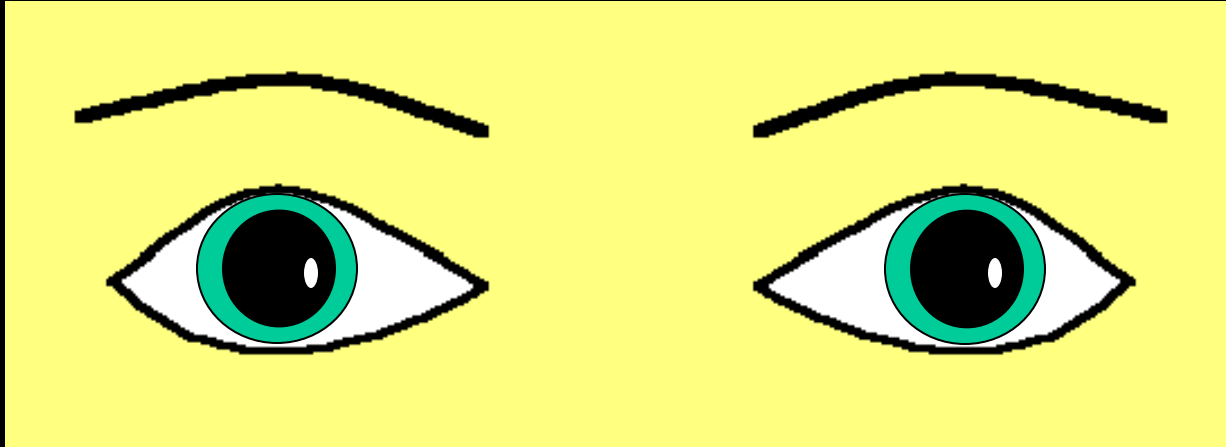
Corneal Light Reflection Test



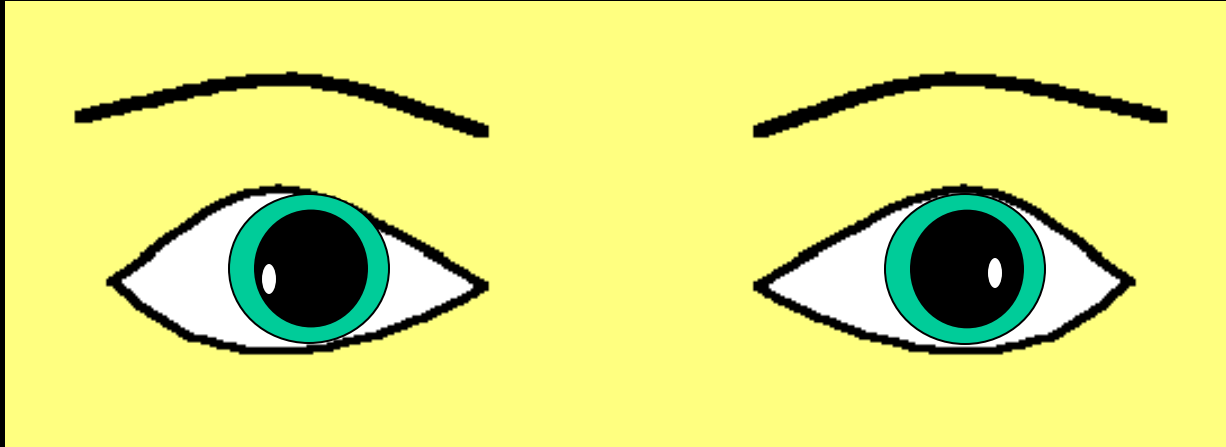
An easy test to see if the eyes are aligned

- A light is shone onto the eyes and the position of the light reflex is noted

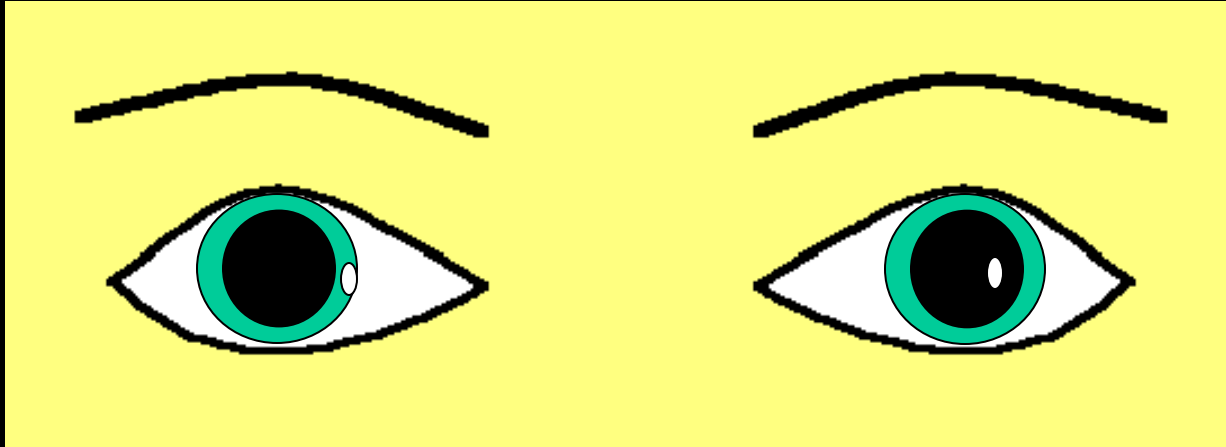




The light reflects off the cornea in the same place in each eye if the ocular axes are aligned



If the eyes are convergent the light reflexes are asymmetrical and on the outer aspect of the cornea of the (R) squinting eye



If the eyes are divergent the light reflexes are asymmetrical and on the inner aspect of the (R) squinting eye cornea

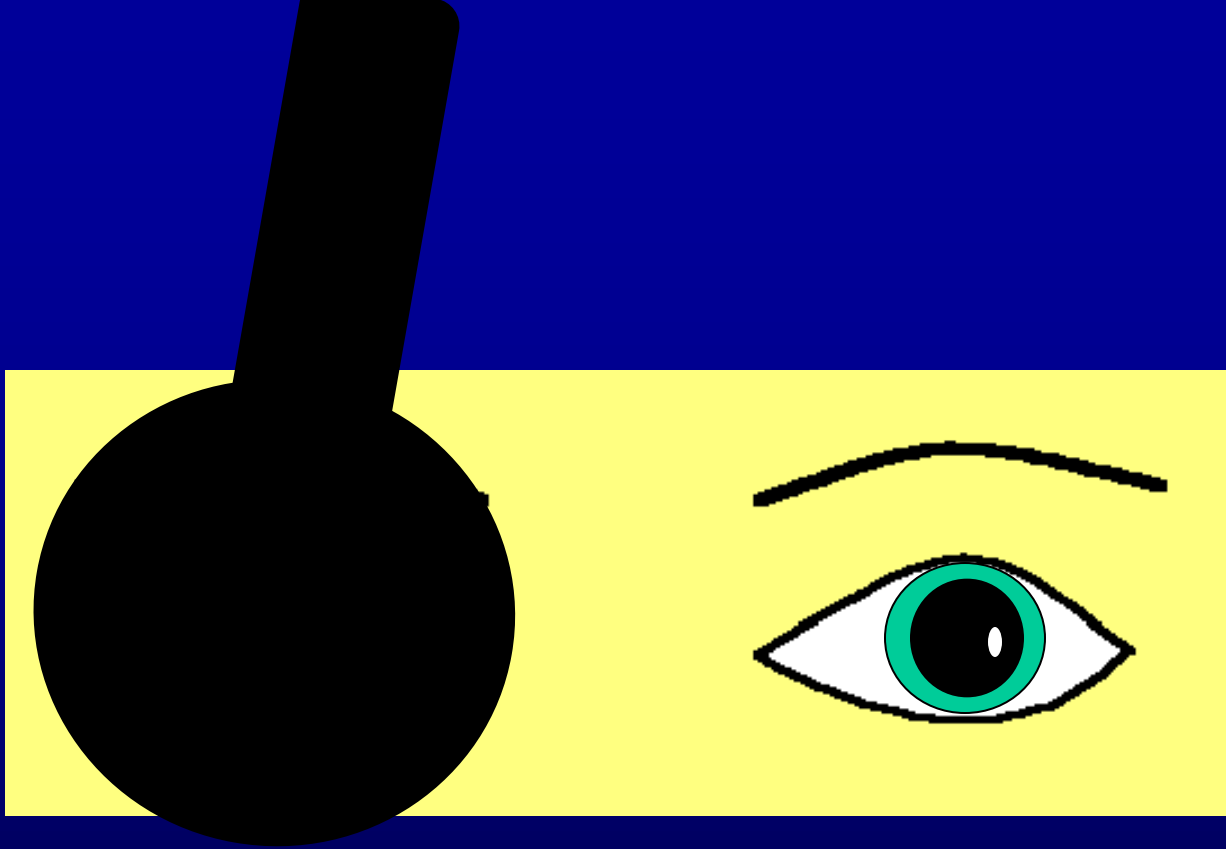
Confirming misalignment

The cover test

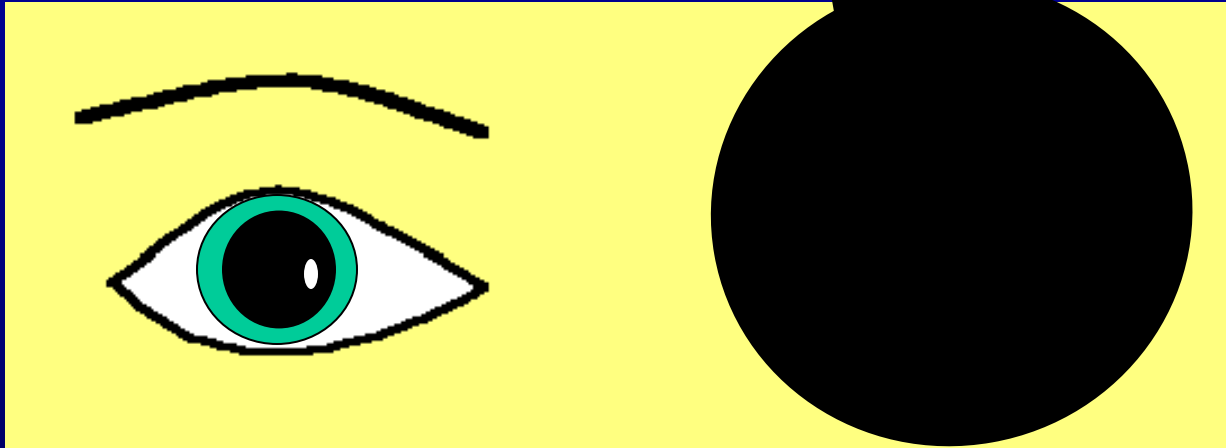
This is a test to detect a manifest squint



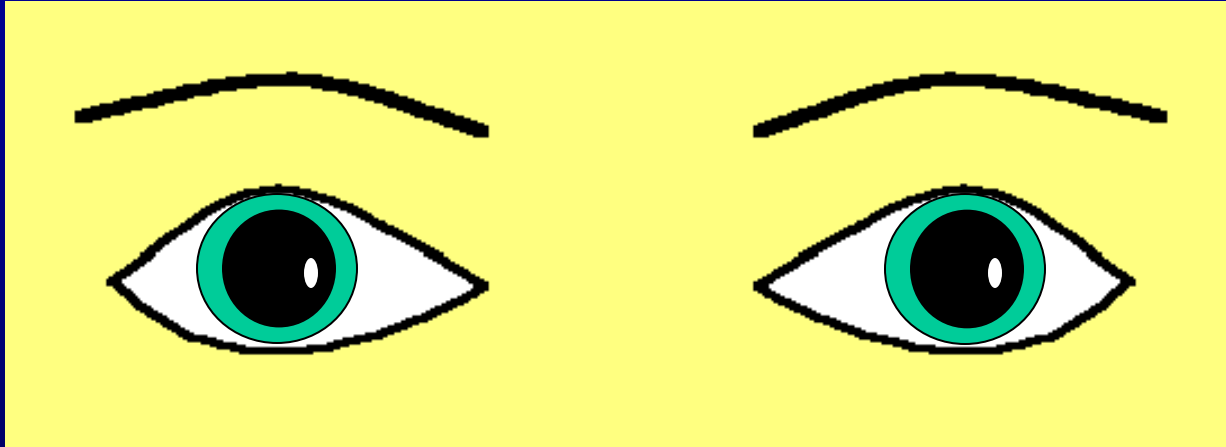
The eyes are alternately covered and uncovered with the patient looking at a distant and a near target



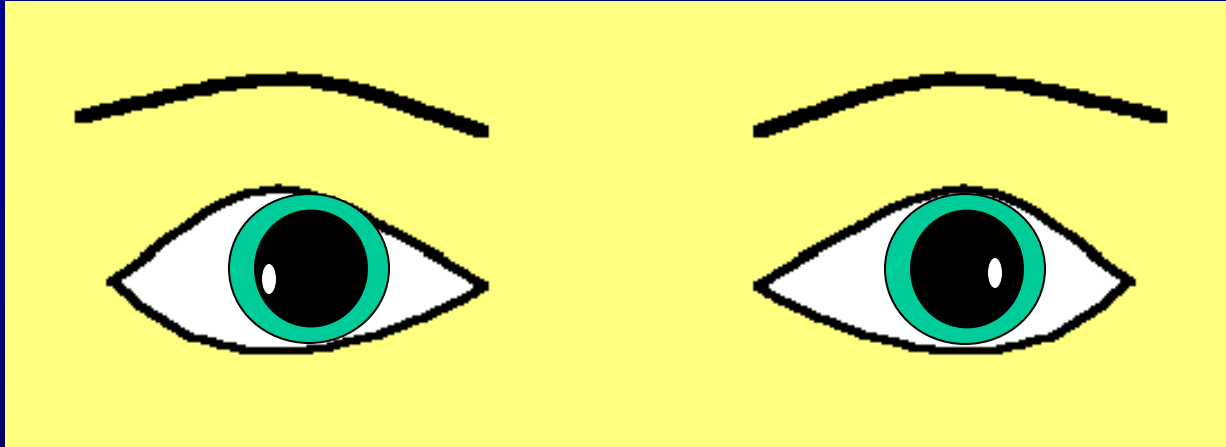
If there is no squint, there is no movement if
either eye is covered or uncovered



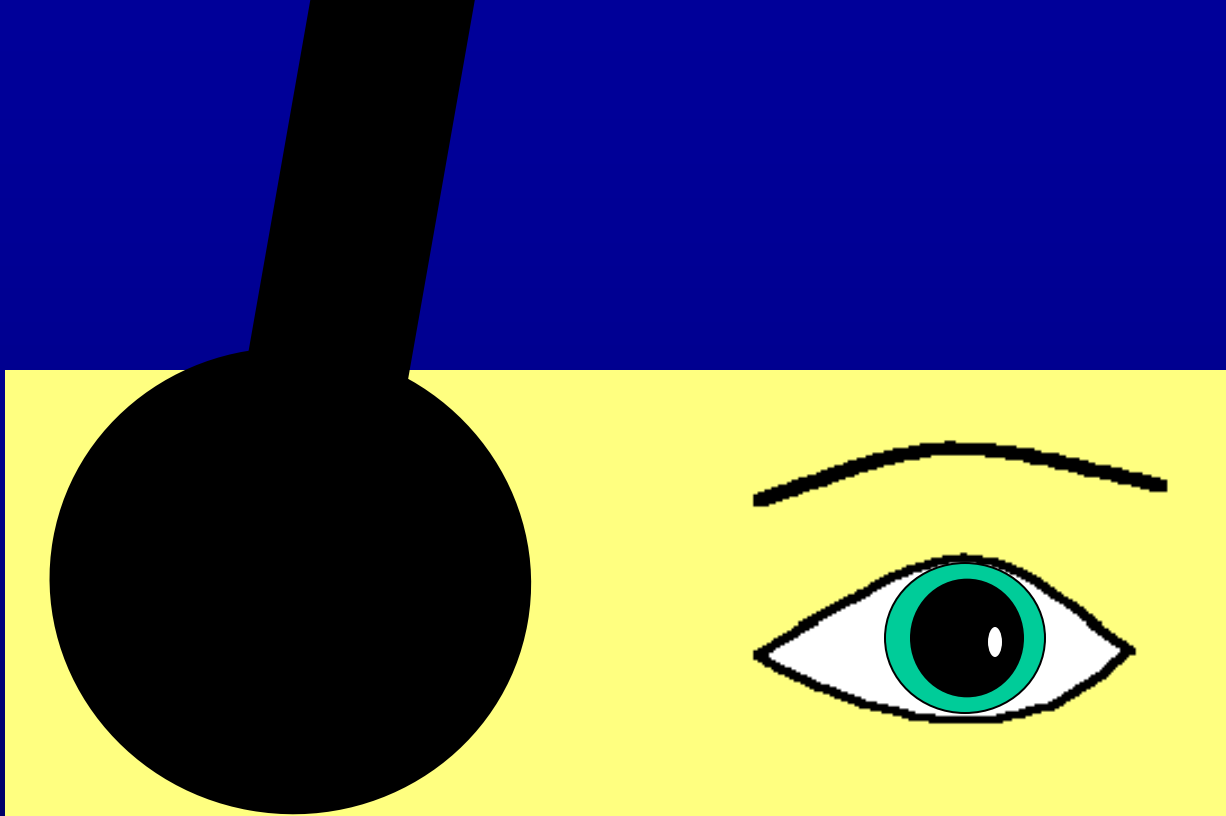
If there is no squint, there is no movement if
either eye is covered or uncovered



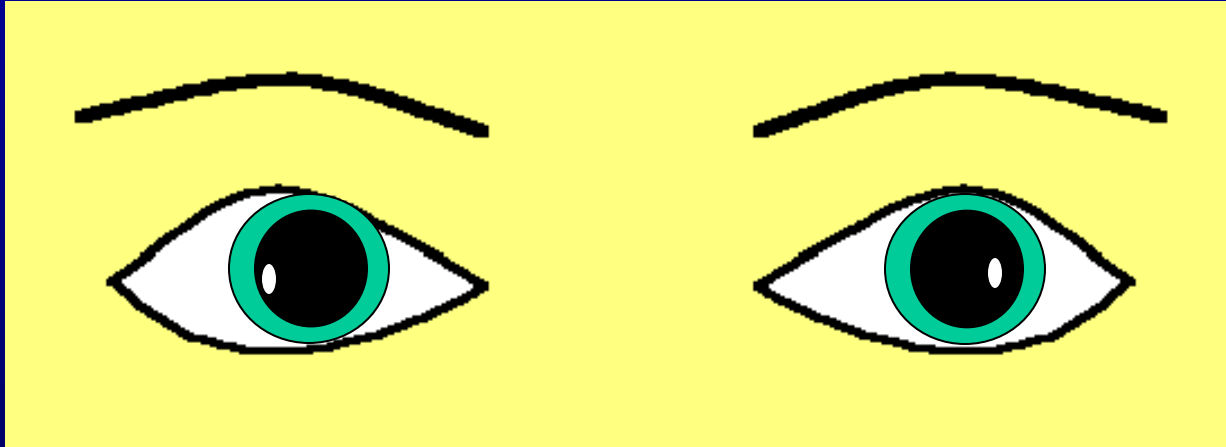
If there is no squint, there is no movement if
either eye is covered or uncovered



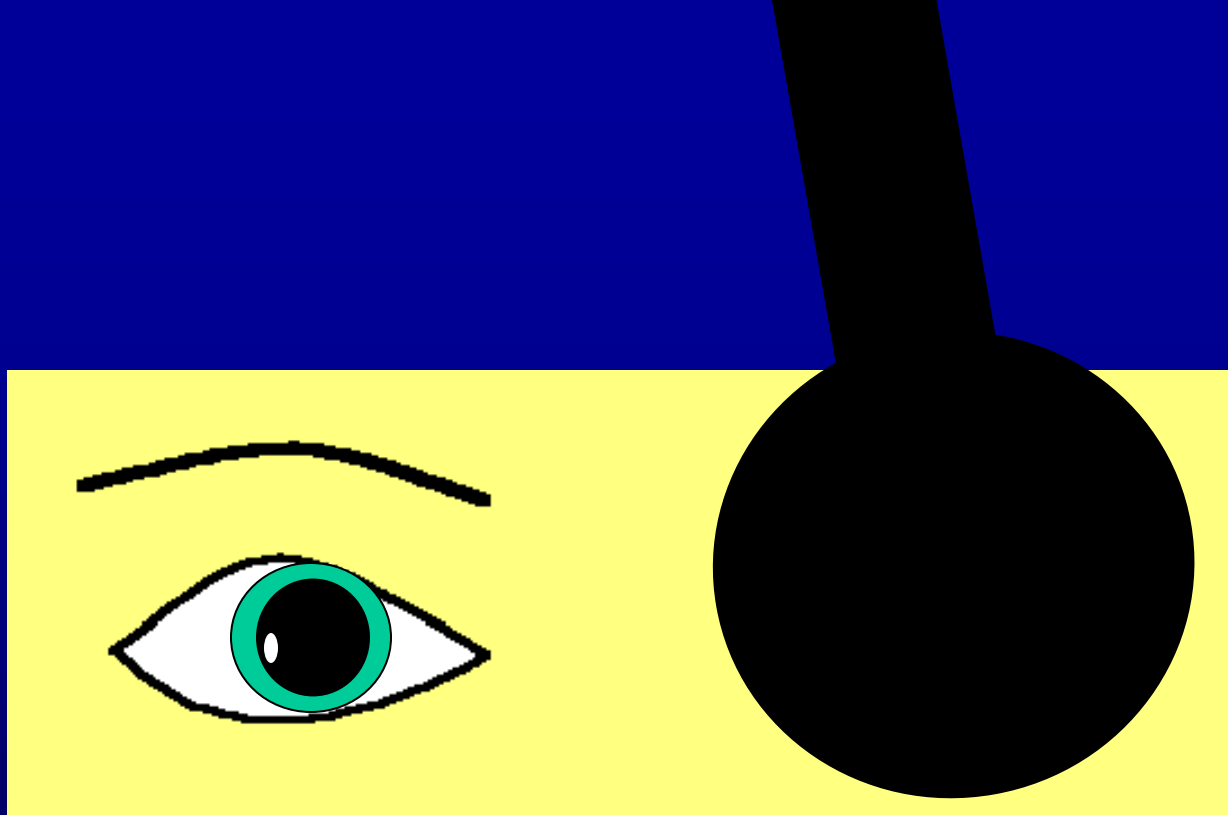
This is a right convergent squint



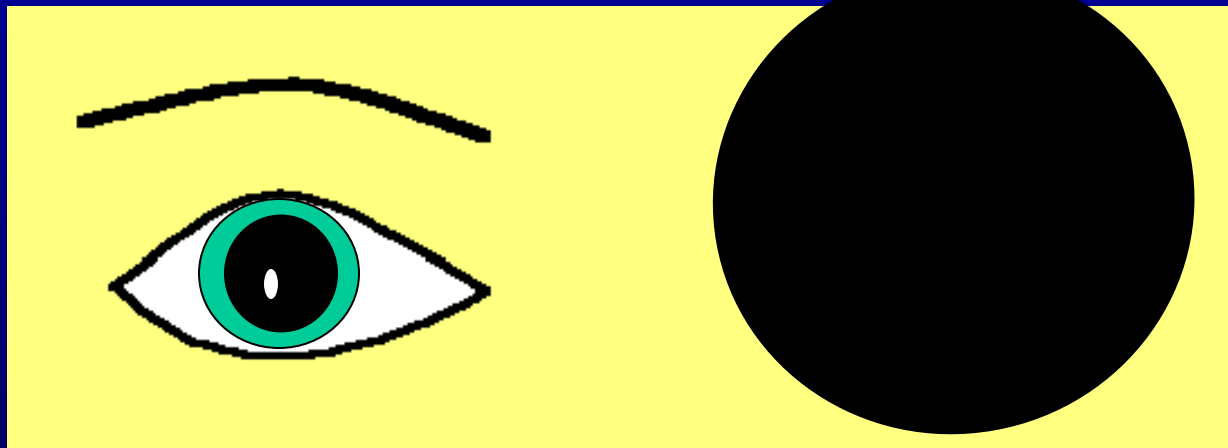
If we cover the right squinting eye nothing happens to the left eye



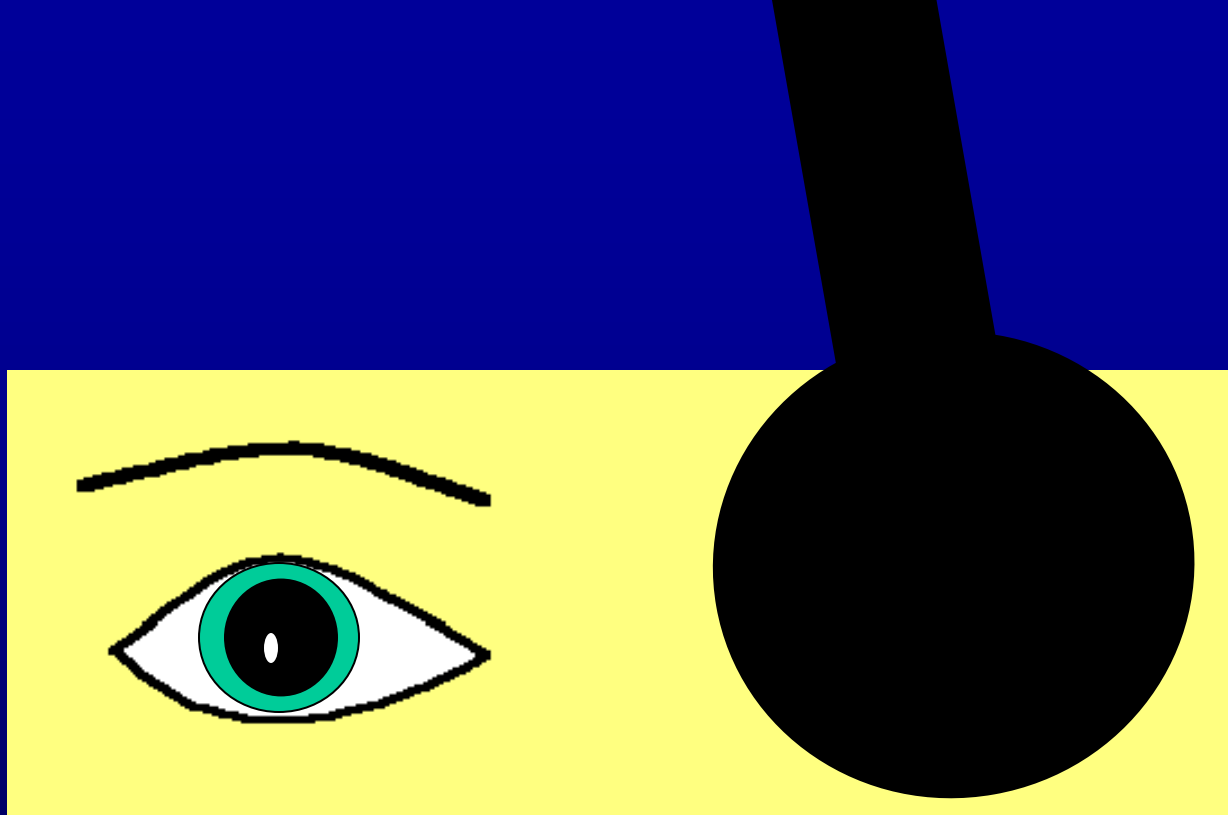
If we uncover the right eye nothing happens
to either eye



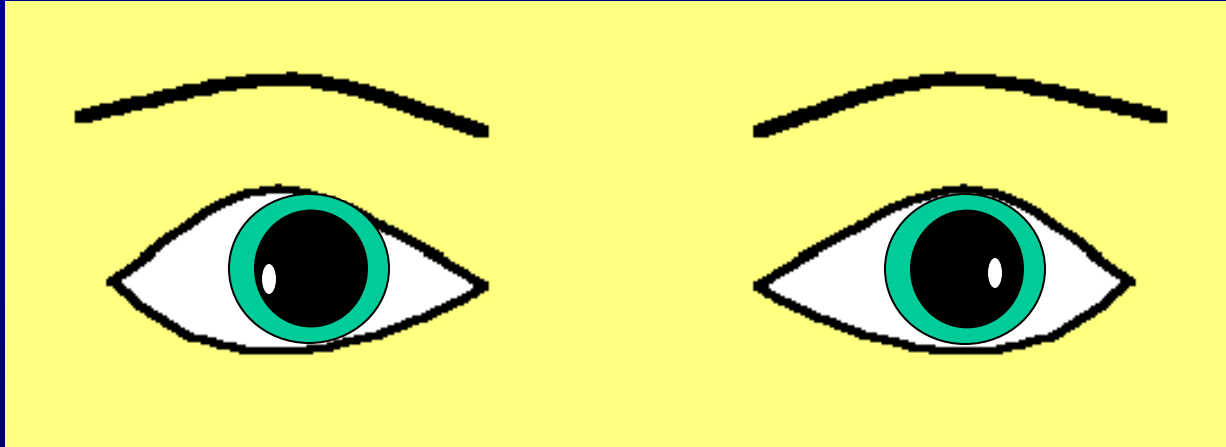
If we cover the left eye.....



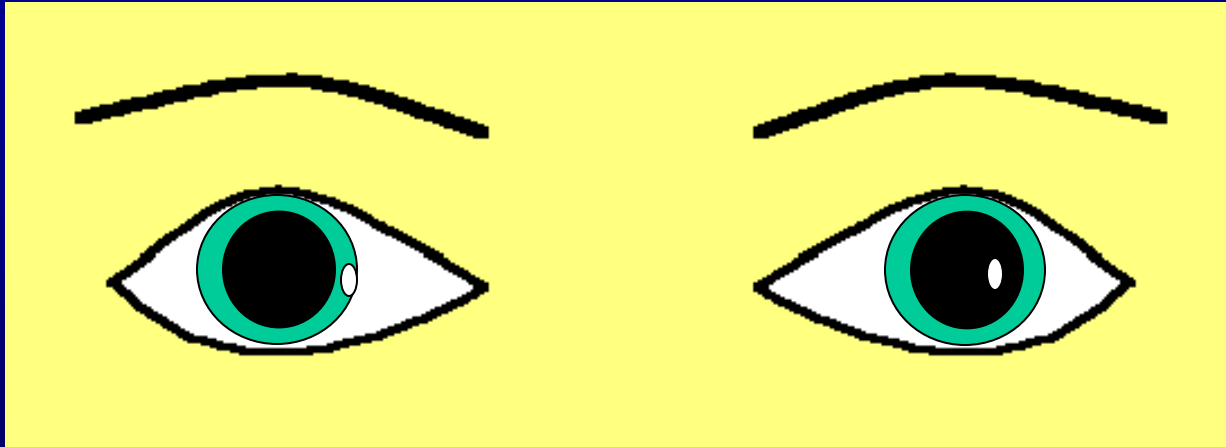
.....the right comes out to take up fixation



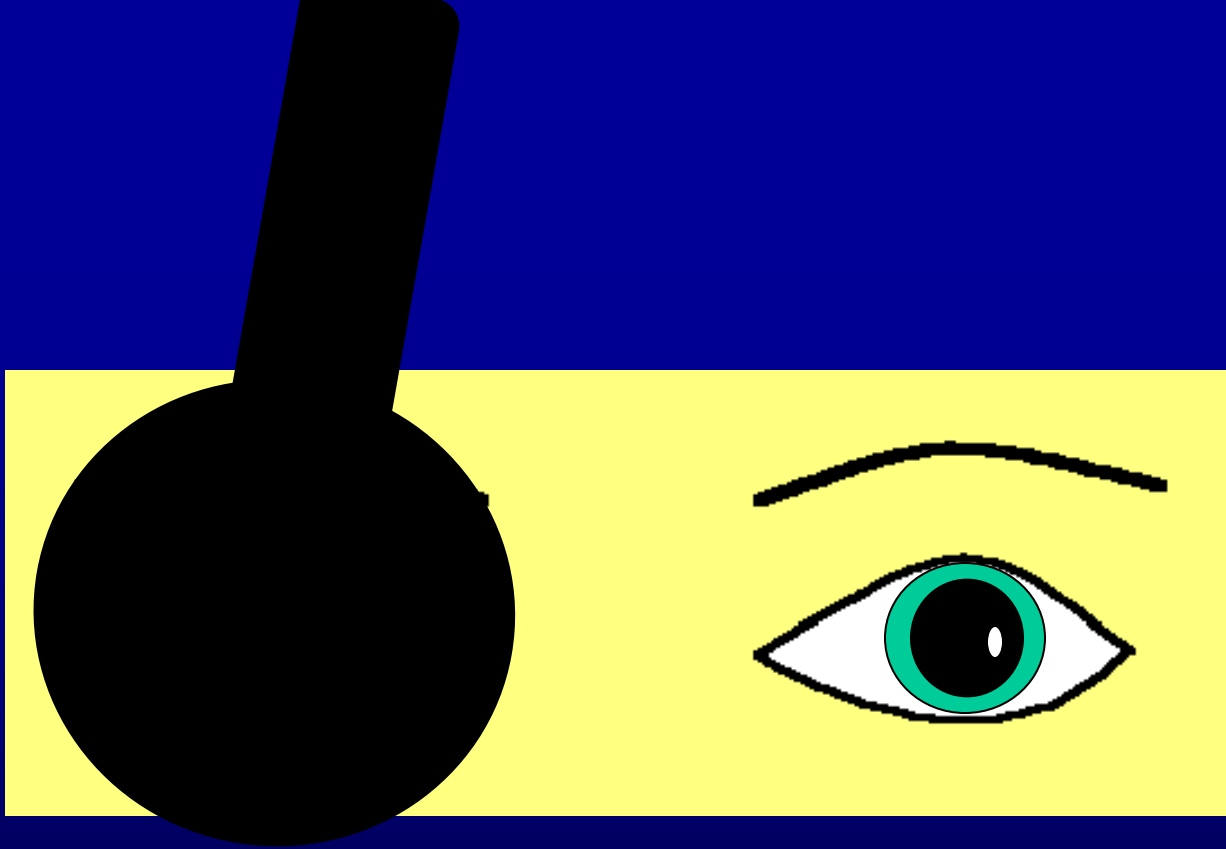
If we now uncover the left eye.....



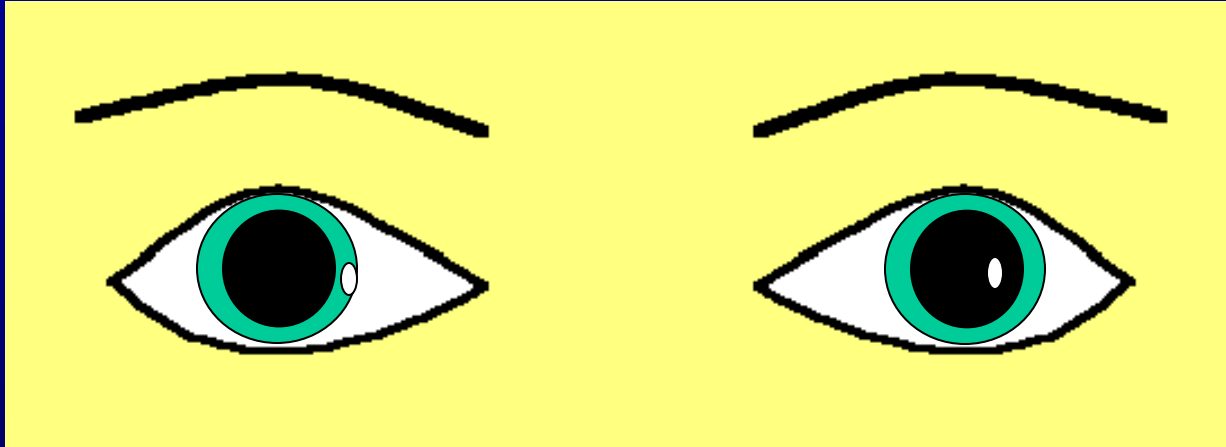
The left eye resumes fixation and the right eye moves back to its convergent position.



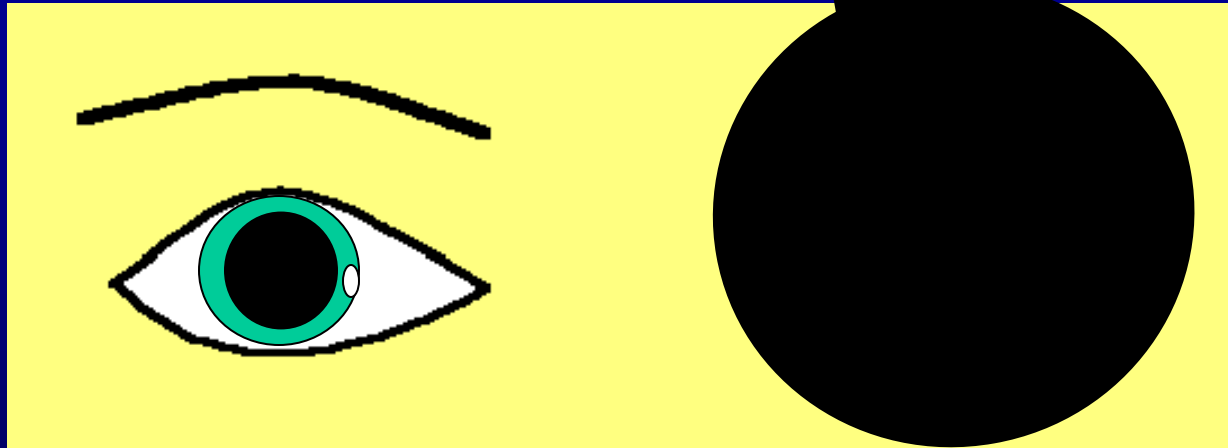
This is a right divergent squint



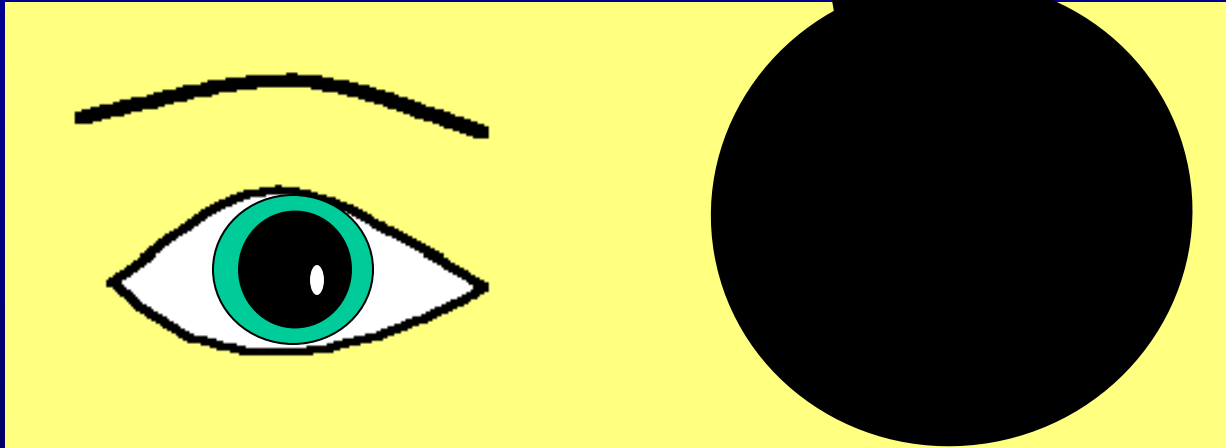
If we cover the right squinting eye nothing happens to the left eye



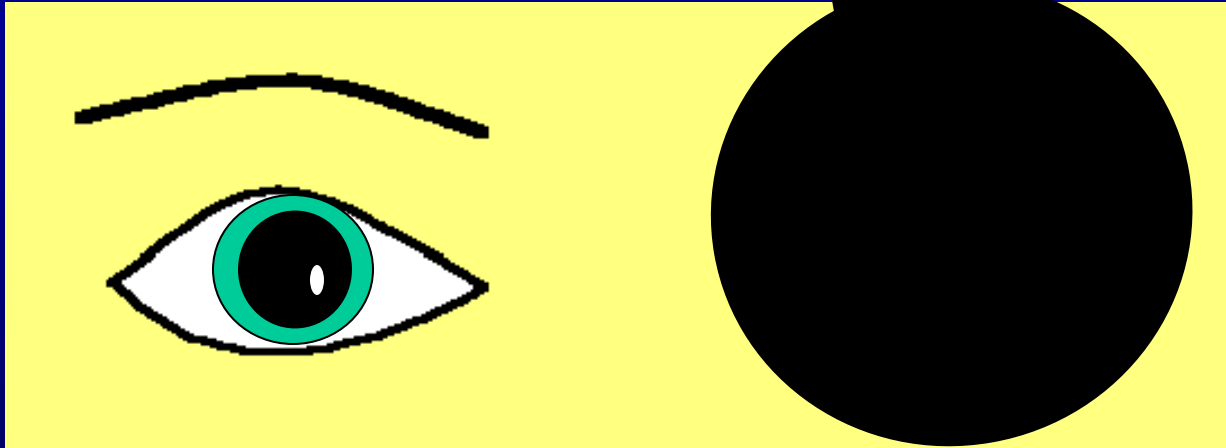
If we uncover the right eye nothing happens
to either eye



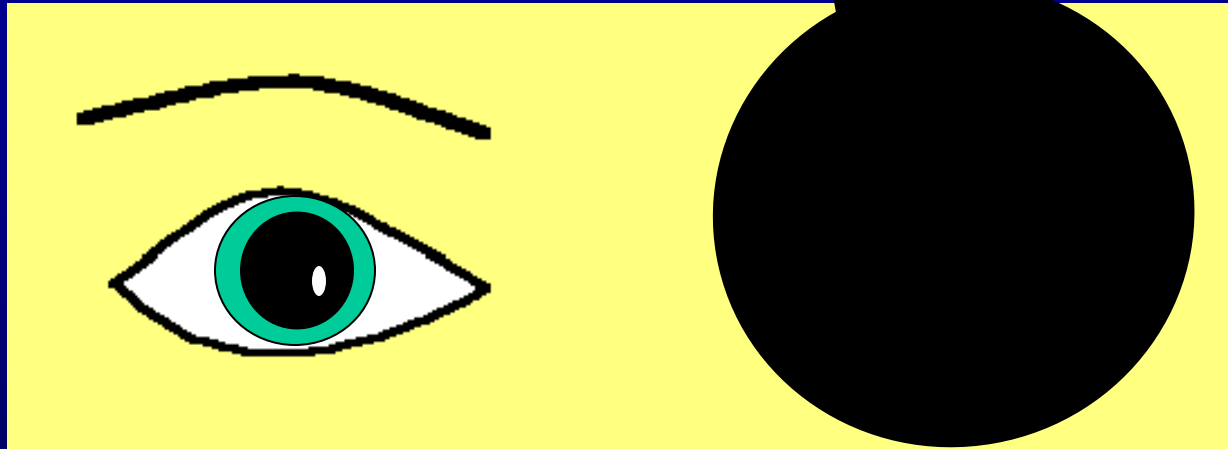
If we cover the left eye.....



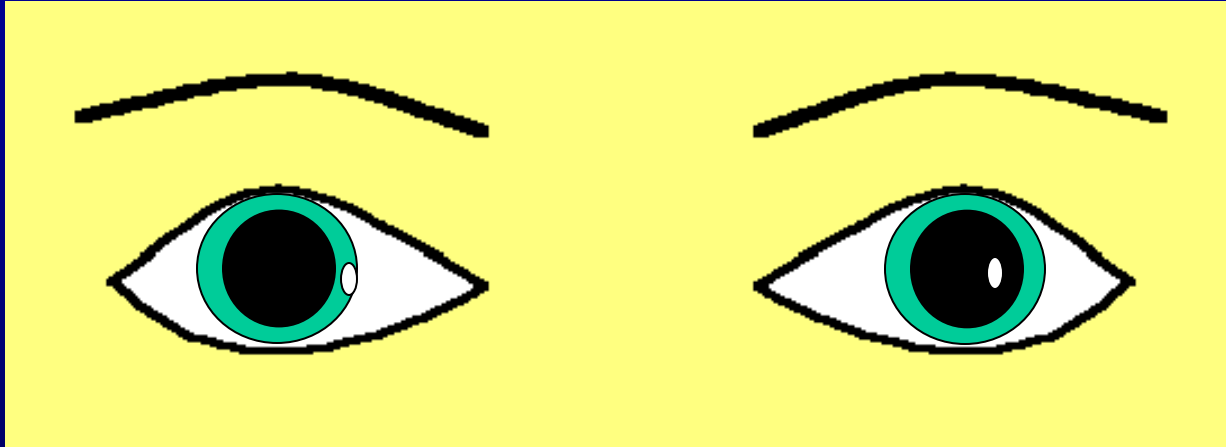
.....the right eye moves in to take up
fixation



.....the right eye moves in to take up
fixation

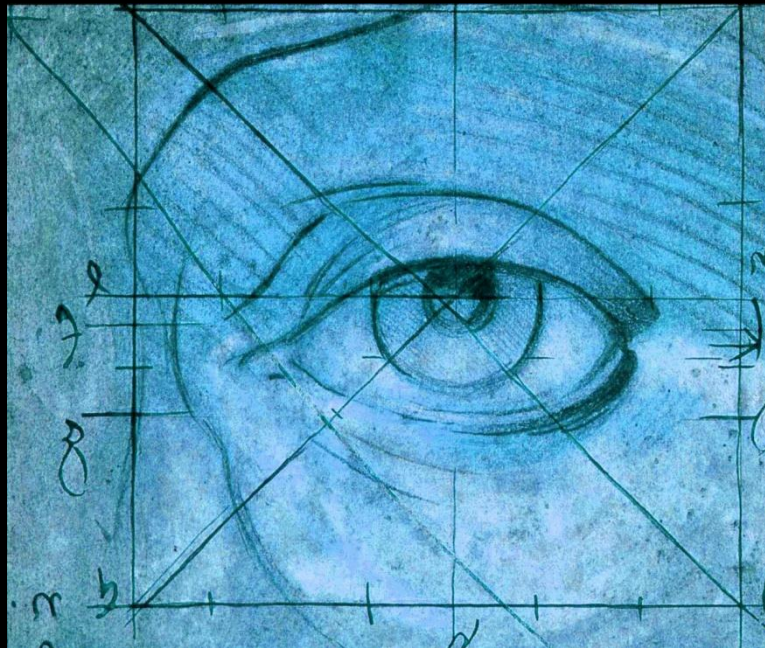


If we now uncover the left eye.....



the right eye moves back to its divergent position and the left eye resumes fixation .

Extra-ocular movements to a target



The patient's eyes are moved into the nine positions of gaze



up
and
right

up
and
left

Up

Primary
position

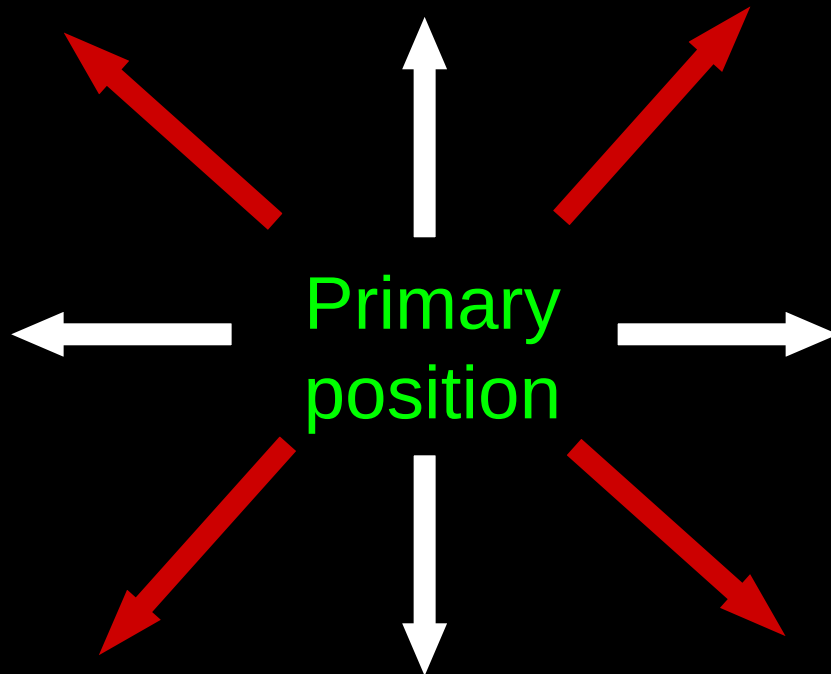
Right

Left

down
and
right

down
and
left

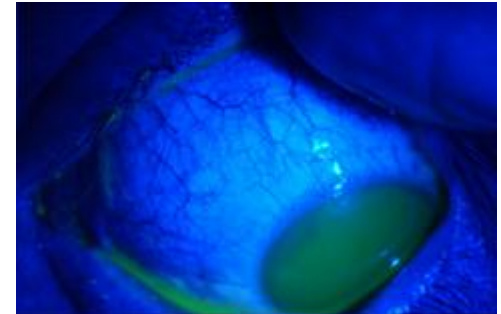
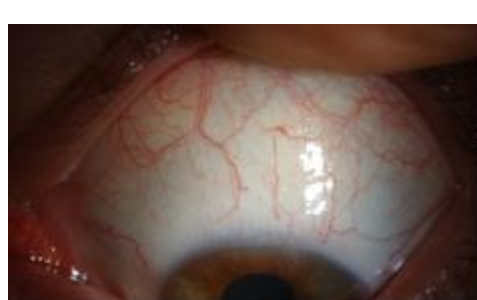
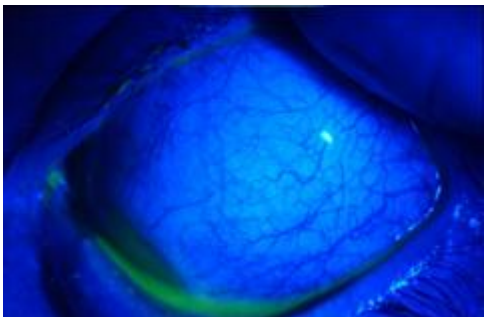
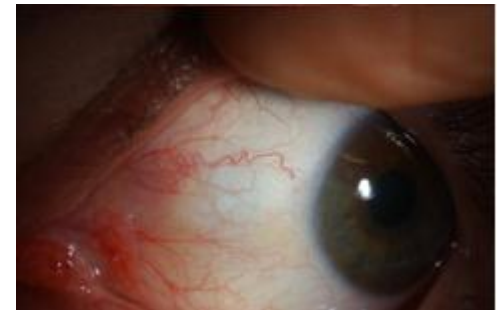
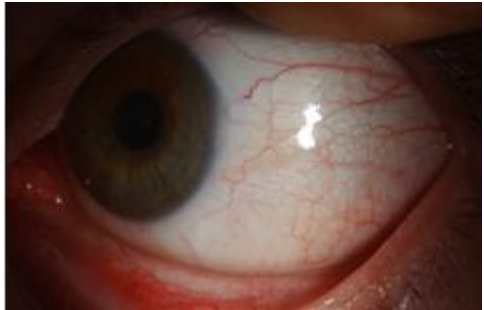
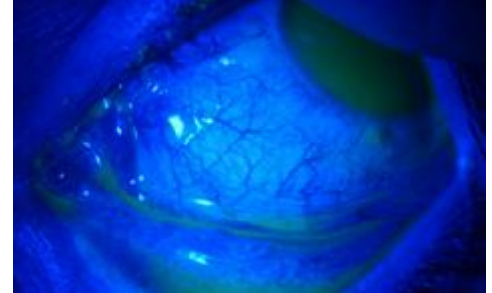
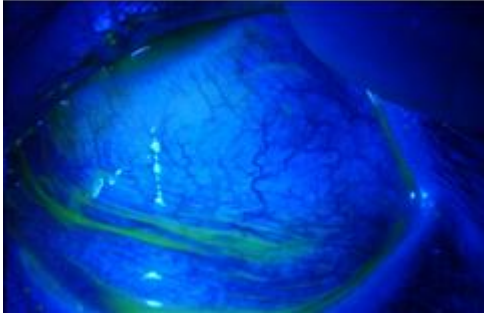
Down



Asked to follow a target and report any diplopia



EYE MOVEMENTS



Illustrative GP Case

**History = punch to eye 2/7 ago
"vision a bit blurry"**



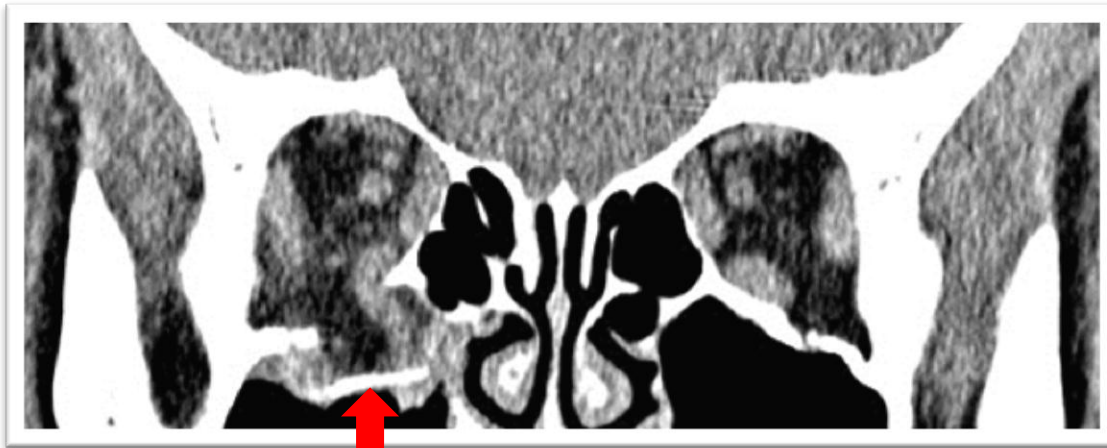
On examination

- Visual acuity 6/6 R 6/6 left
- Inspection
 - Marked Lid bruising & subconjunctival
 - Conjunctiva & Cornea (Fluorescein + Blue illumination)
 - Pupils normal
 - Anterior chamber no hyphaema
 - *Plan – conservative and see SOS*
 - Returns at 10/7 with double vision
 - Tingling on cheek (Infraorbital paraesthesia)
 - *Check ocular motility*

ORBITAL BLOW OUT FRACTURE (Right Orbit)

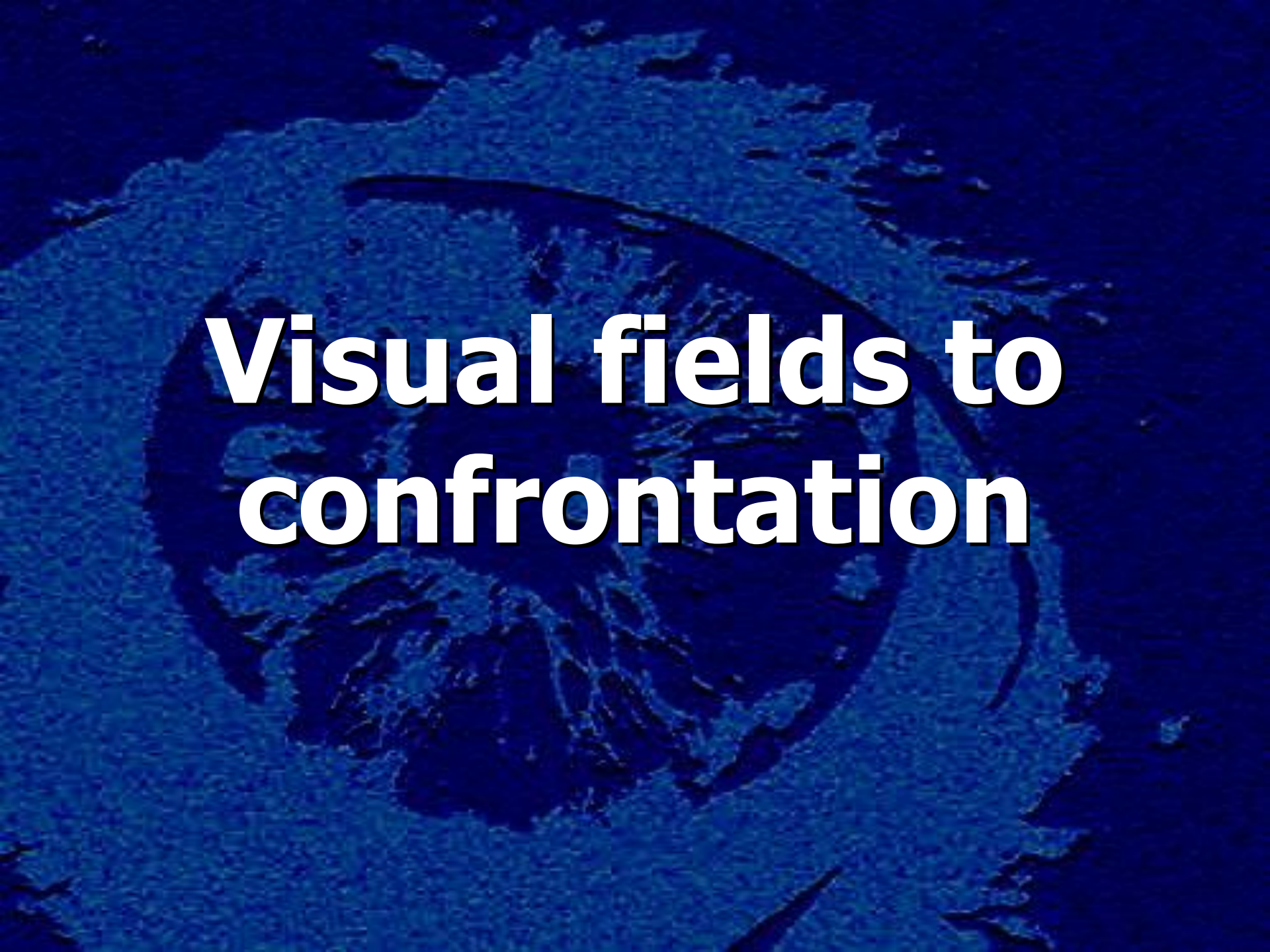


ORBITAL BLOW-OUT FRACTURES



Management

- CT Orbits
- No nose blowing
- Augmentin
- Refer



Visual fields to confrontation

- Ask the patient to look at your face and see if any bits are missing.
- Check for hemianopia
- Finger counting
- Target in the periphery
- Amsler Grid for macula





Counting fingers

You are
comparing
fields, so it
is important
to be on the
same level
as the
patient



Present 1,2, 3 or no fingers in each quadrant



Remember
the target is
presented
midway
between you
and the
patient

Peripheral field to a target

A target is brought in slowly from the periphery in the centre.

The patients fixes on your eye throughout this



Visual fields: In practice



Confrontation testing: finger counting

Visual field defects



Normal field

Visual field defects



Hemianopia

Visual field defects



Quadrantanopia

Visual field defects



Central scotoma

Visual field defects

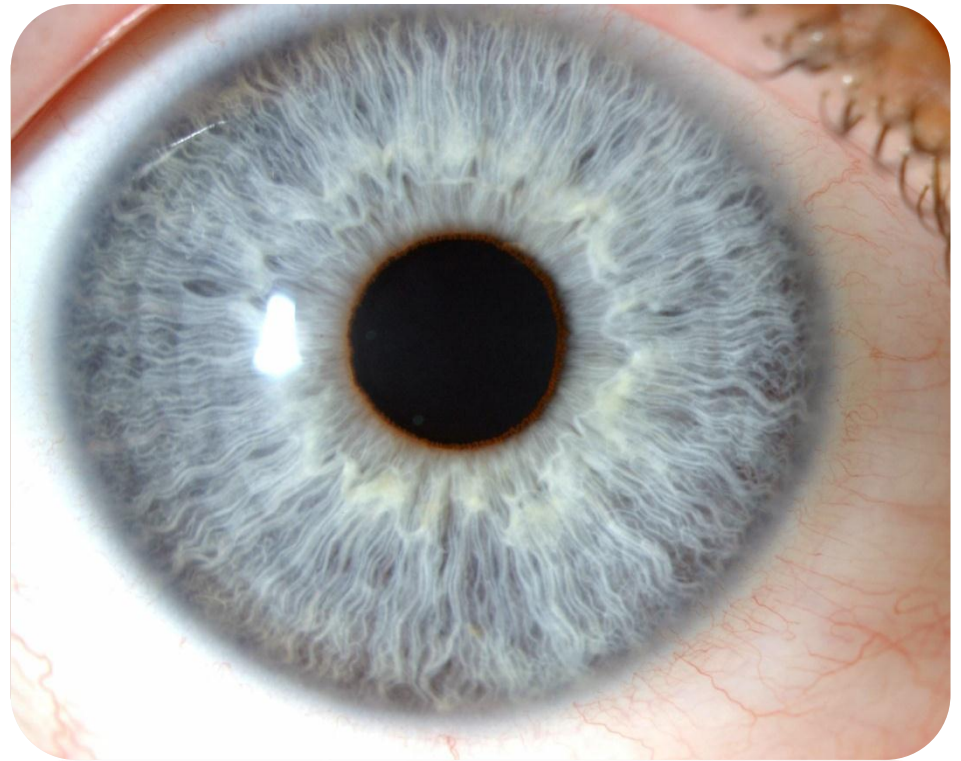


Peripheral constriction: “tunnel vision”

Assessing the external Eye



The Advantage of a Slit-lamp



GP alternatives to a Slit-lamp



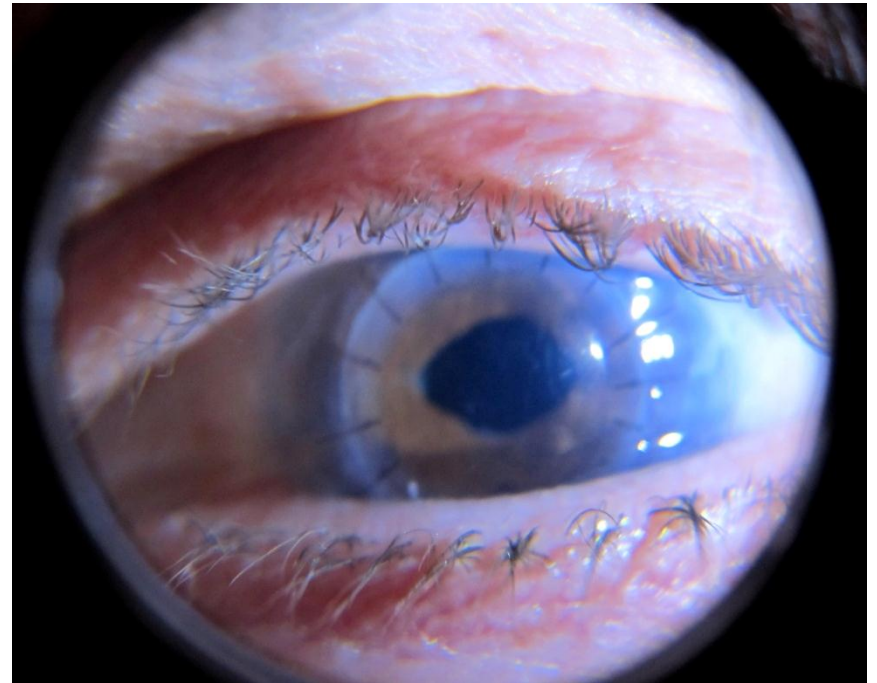
Designs for vision illuminated (Apollo) lens

GP alternatives to a Slit-lamp



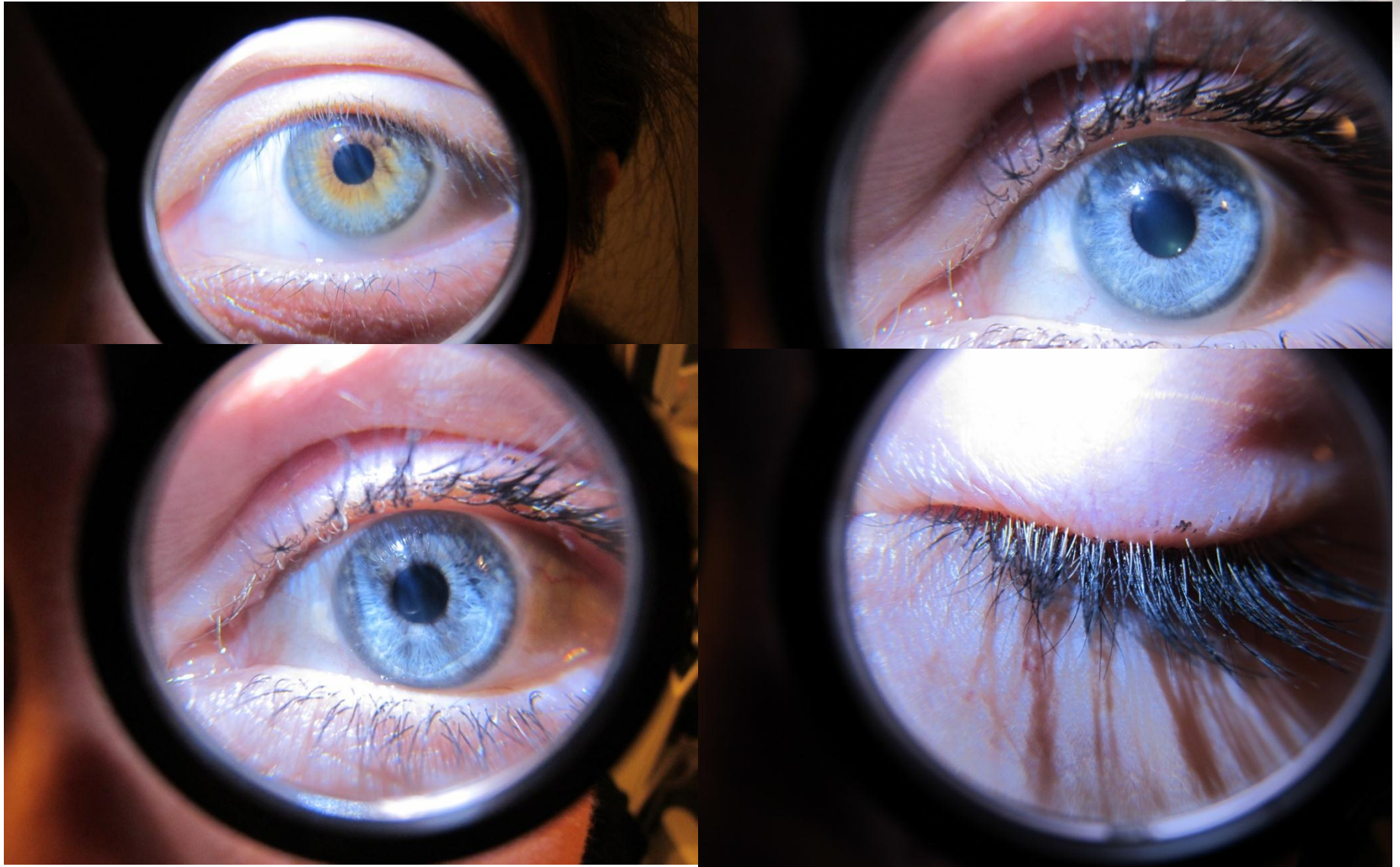
Designs for vision illuminated (Apollo) lens

GP alternatives to a Slit-lamp

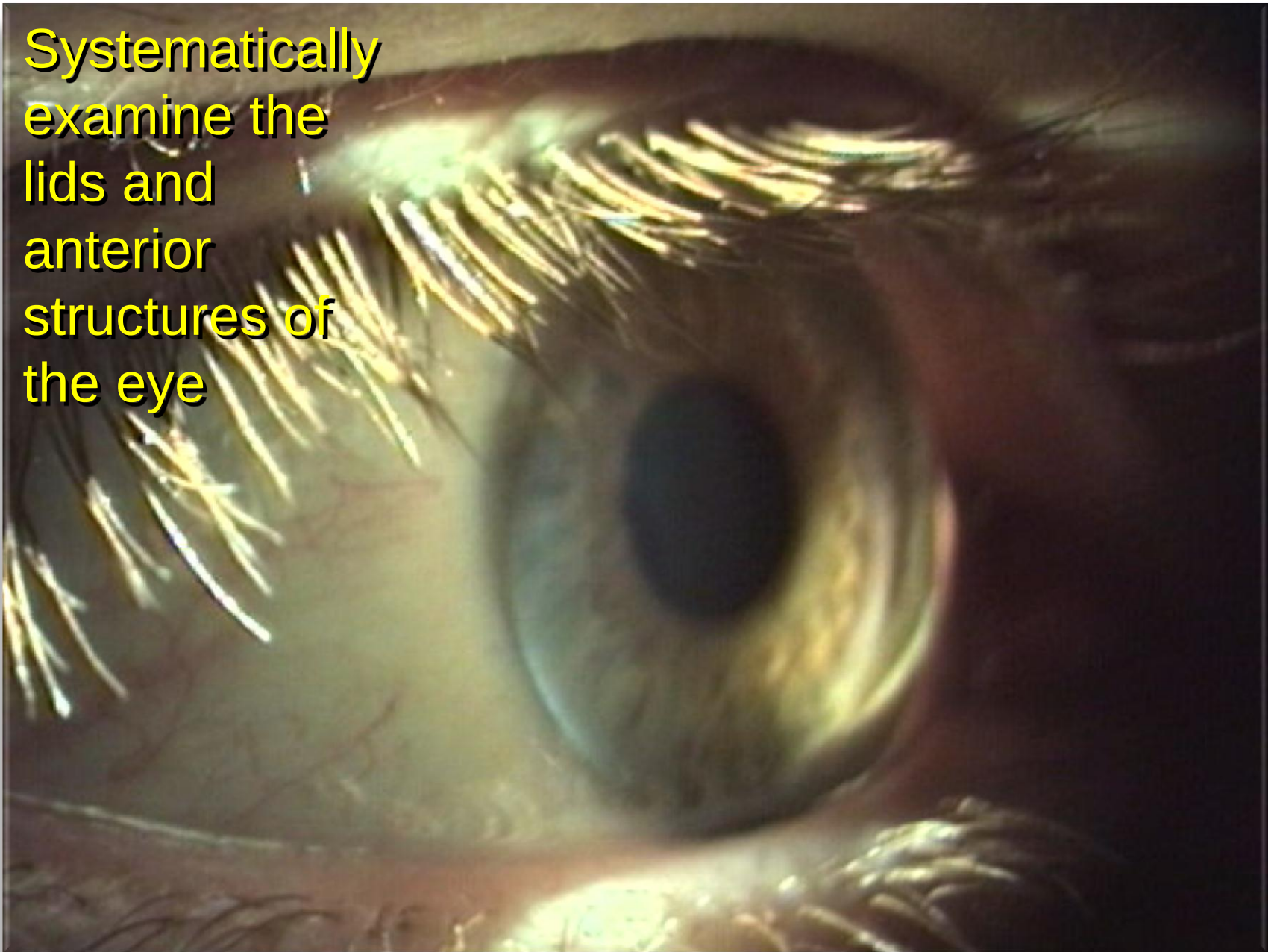


Designs for vision illuminated (Apollo) lens

GP alternatives to a Slit-lamp

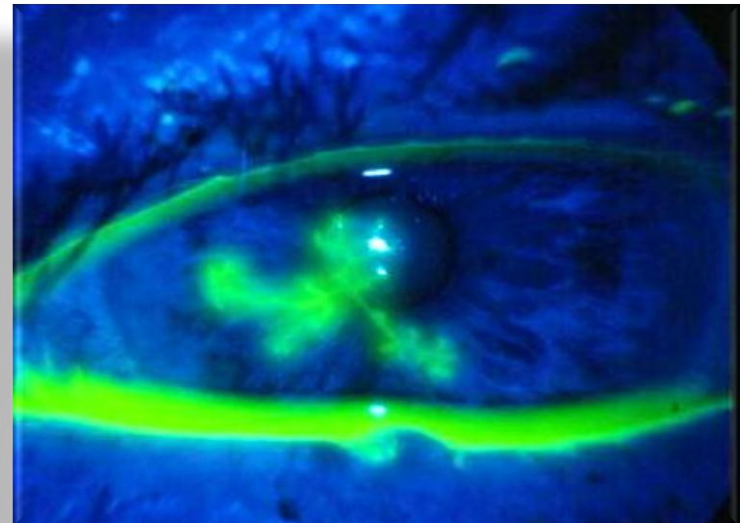


Systematically
examine the
lids and
anterior
structures of
the eye

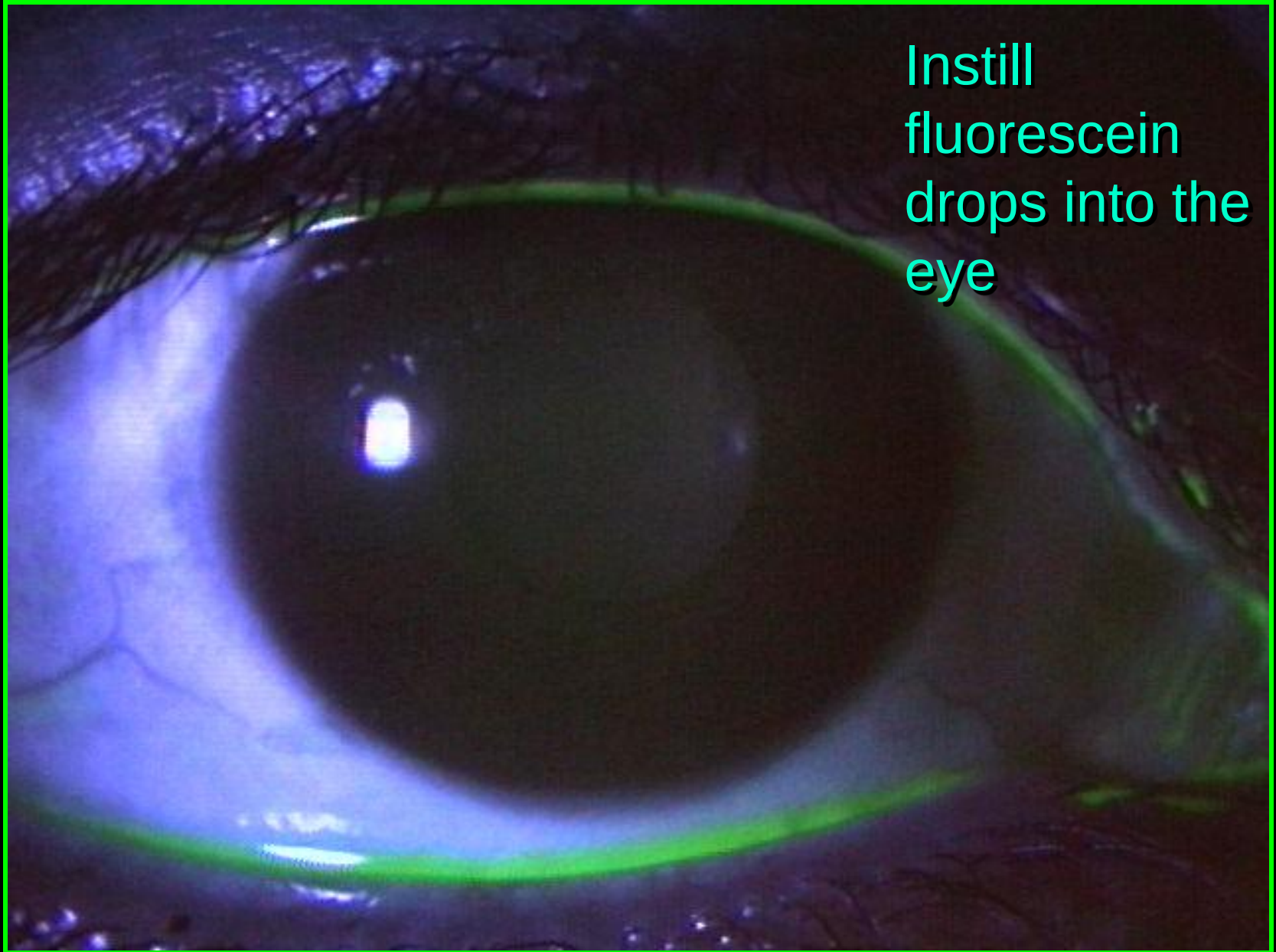


Fluorescein stain – get some

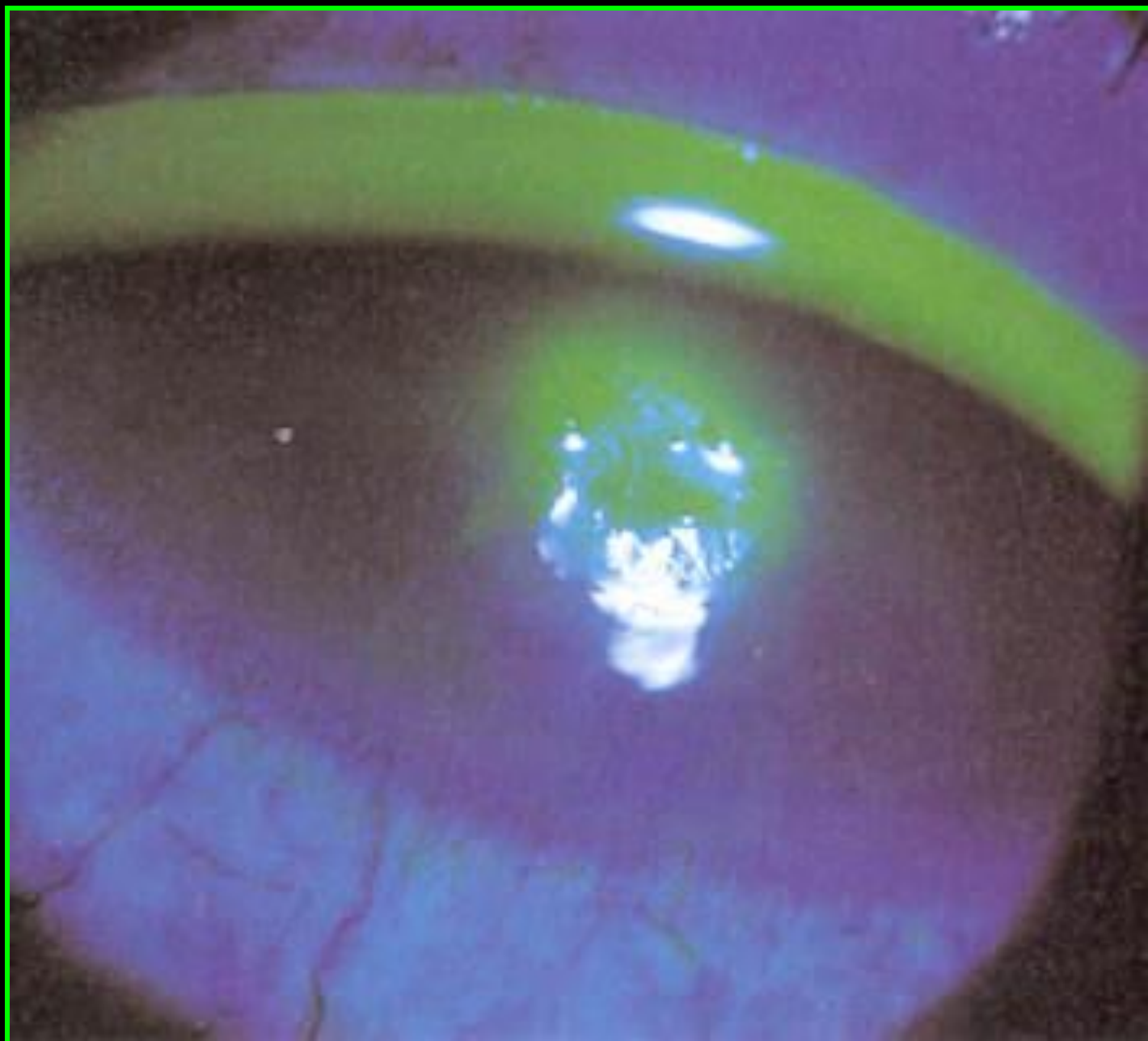
- Stains epithelial defects
- Assessing tear film / dry eye
- Detecting leaks post surgery/trauma
- Checking intraocular pressure



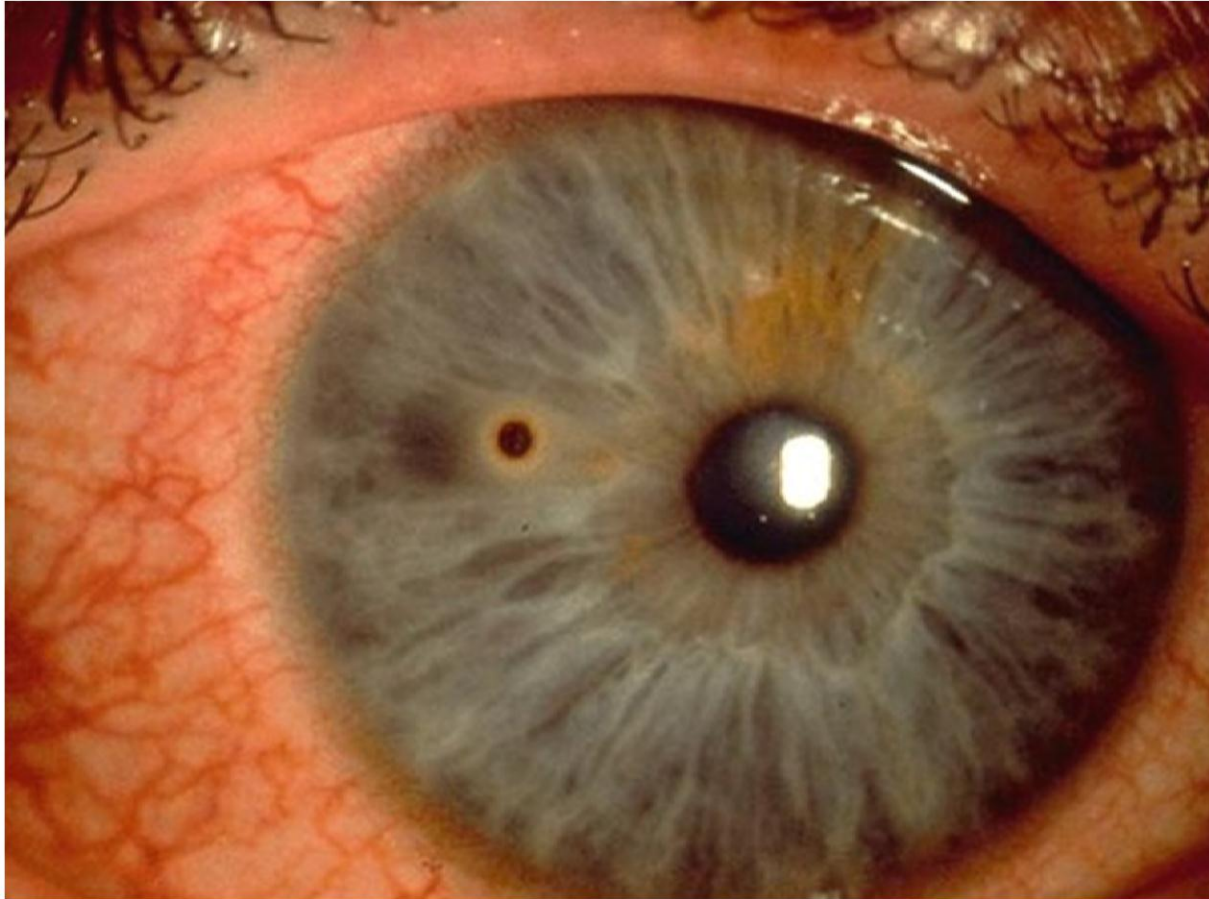
Instill
fluorescein
drops into the
eye



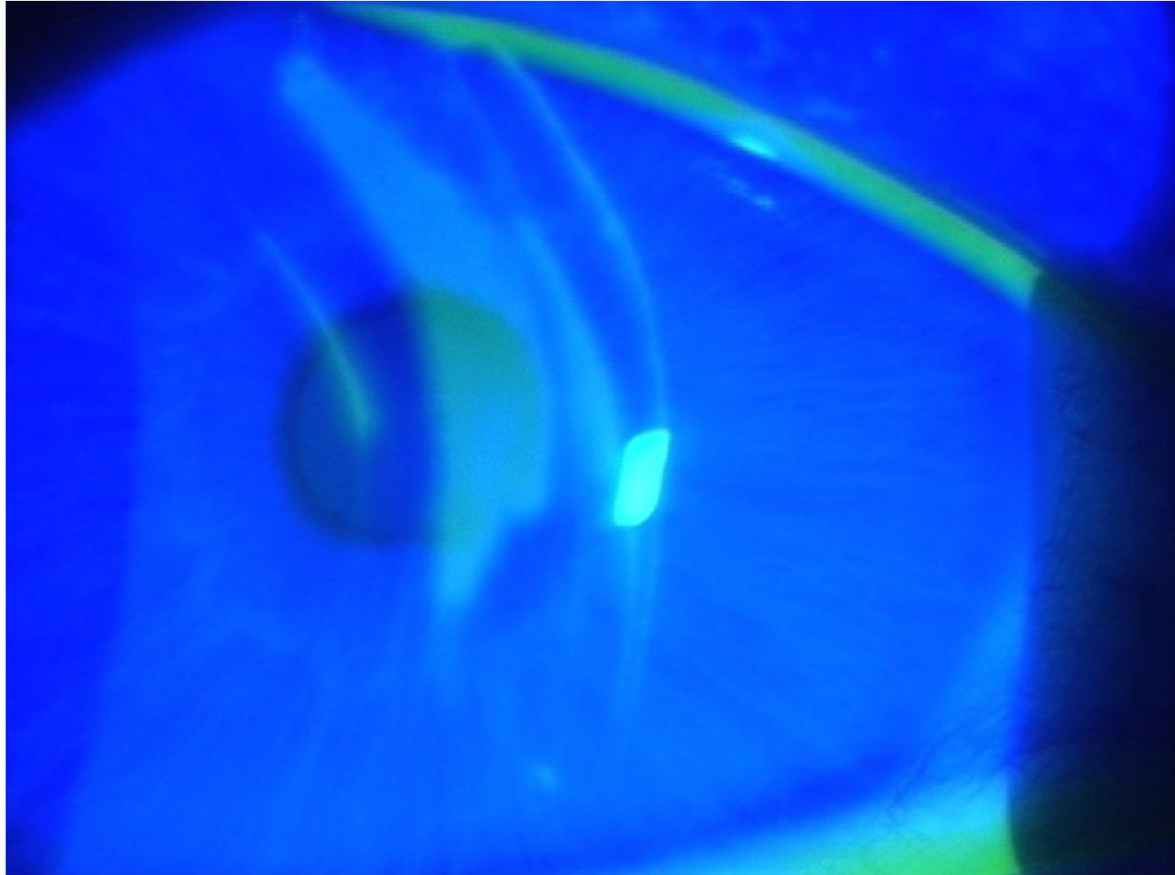




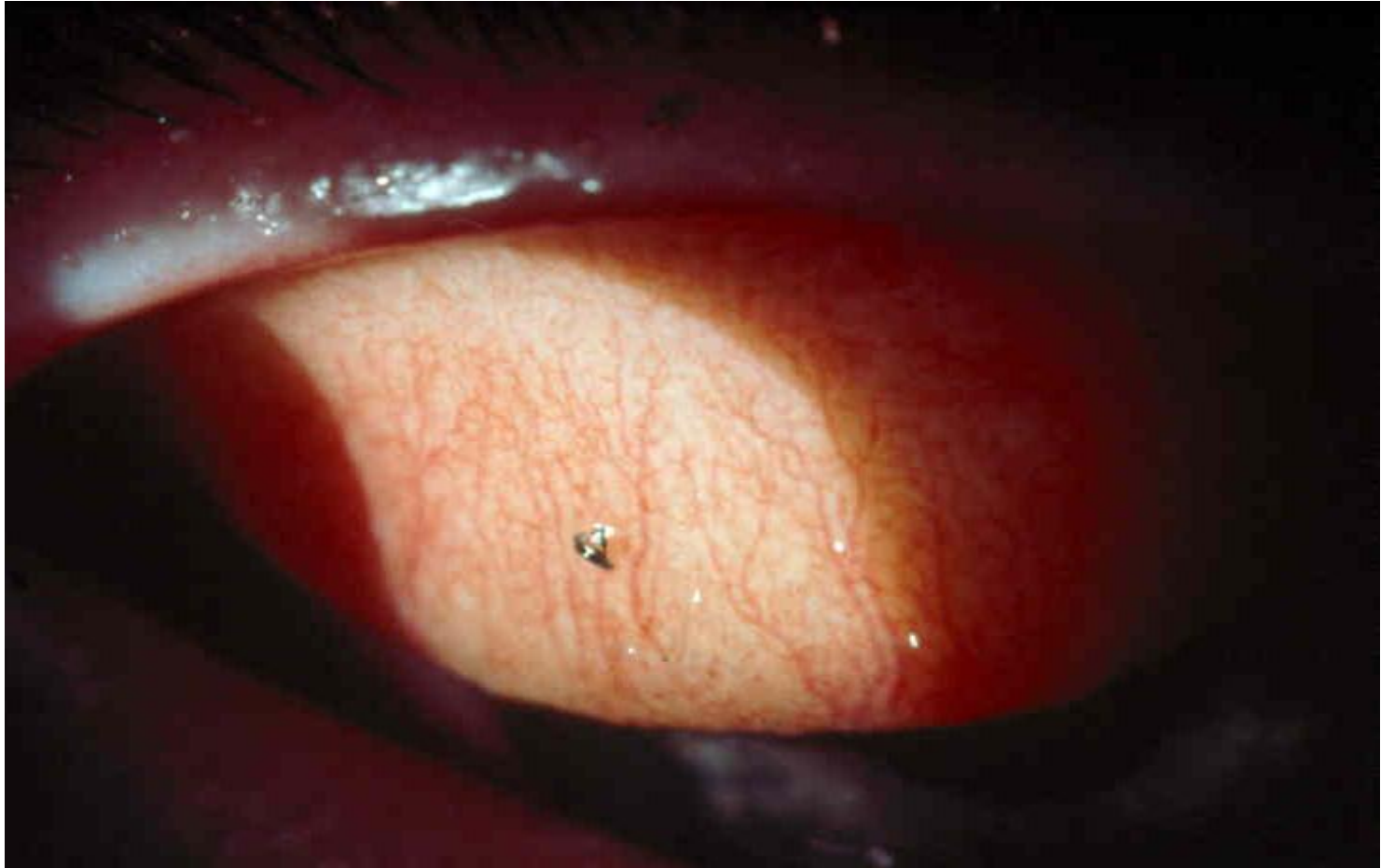
CORNEAL FOREIGN BODY



FOREIGN BODY



SUB TARSAL FOREIGN BODY



Illustrative case : Happy labourer

- **History**
- 26 year old carpenter
- Hammering masonry nail
- Felt something bounce of eye (2pm)
- Foreign body sensation and red eye
- Black “spot” in temporal field
- Attends at 8pm for review

Clinical Signs

OD: UAVA 6/6

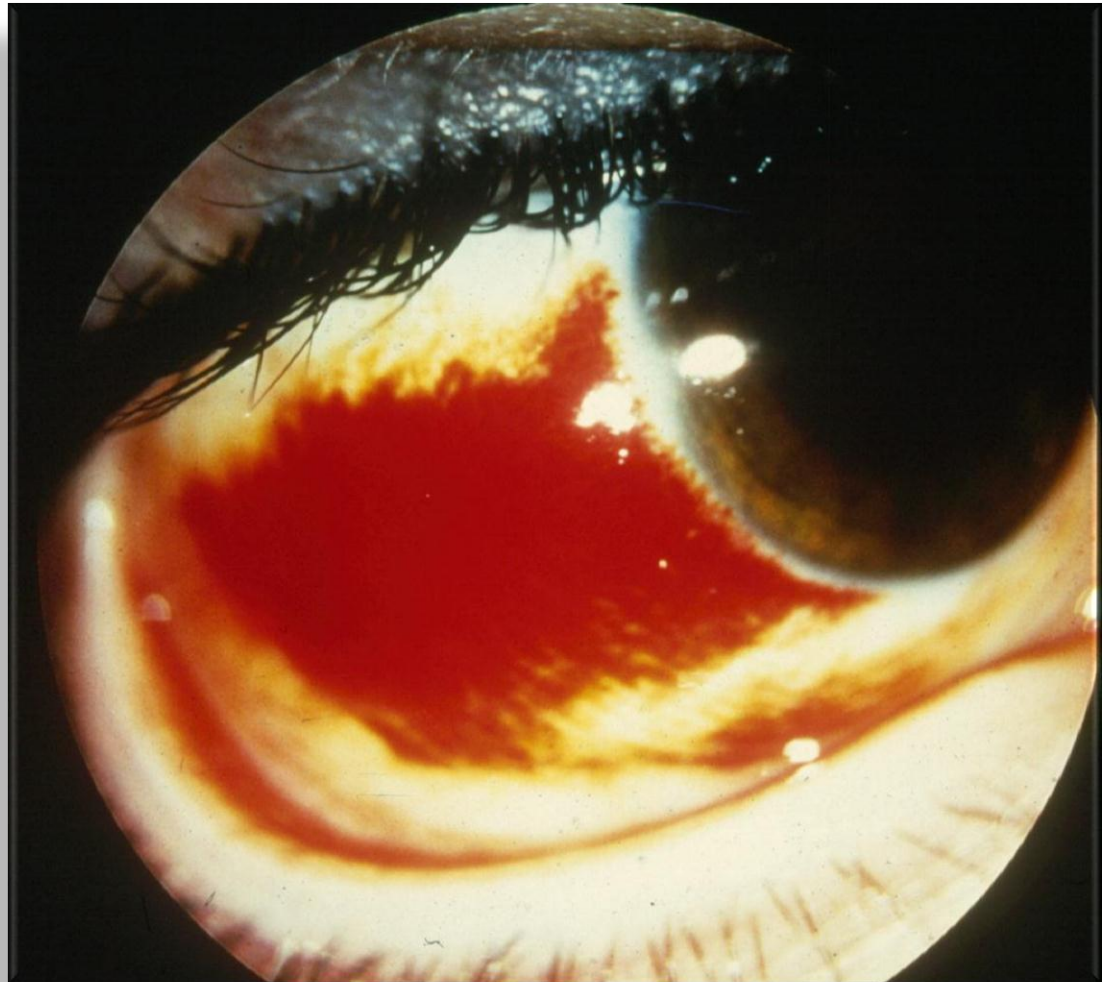
OS: UAVA 6/5

Right eye red

No RAPD

Differential

Diagnoses?



Happy labourer: Differential Diagnosis

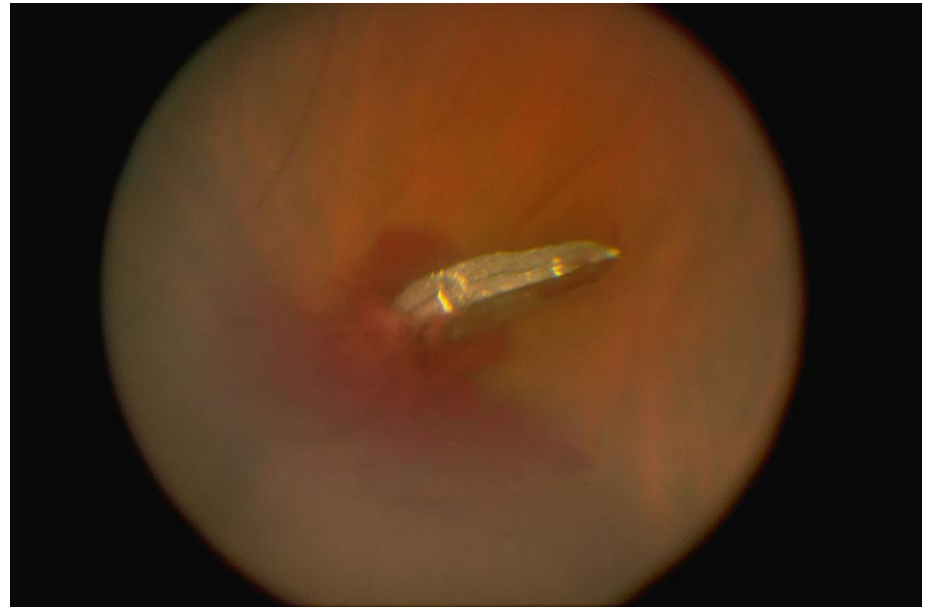
1. Corneal foreign body
2. Penetrating eye injury
3. Subconjunctival haemorrhage
4. Traumatic macular haemorrhage

Differential Diagnosis

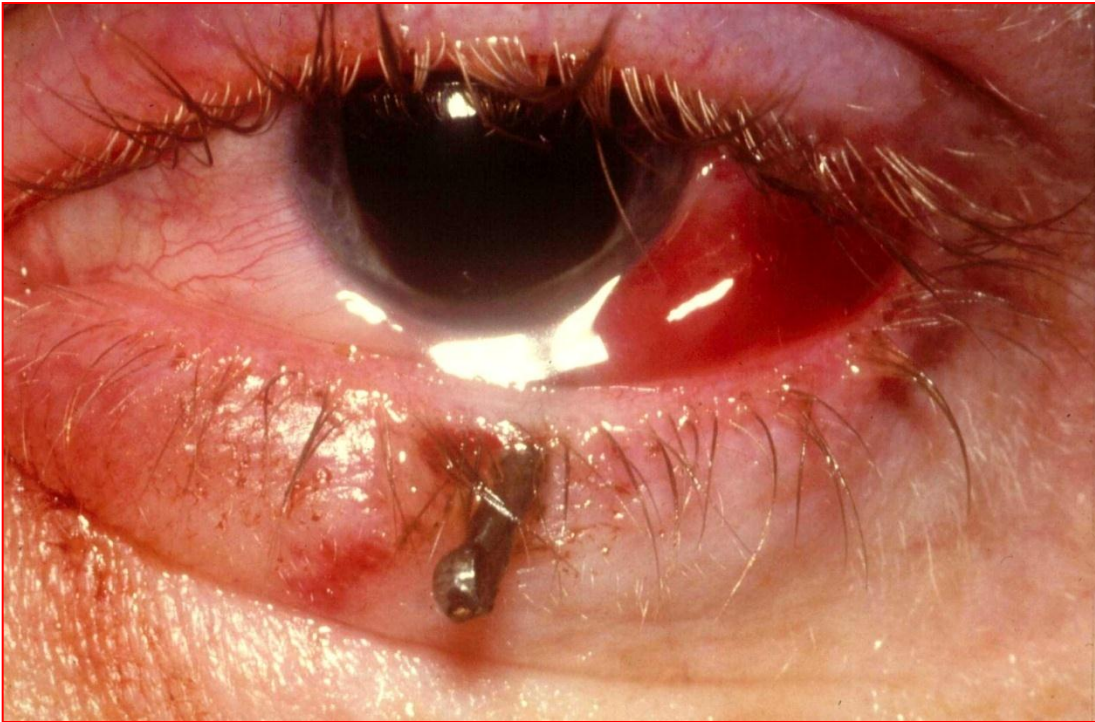
1. Corneal foreign body
2. **Penetrating eye injury**
3. Subconjunctival haemorrhage
4. Traumatic macular haemorrhage

Always suspect penetrating injury!!!

- Hammer & nail
- Hammer and chisel
- Power tools
- **Management**
 - Urgent referral

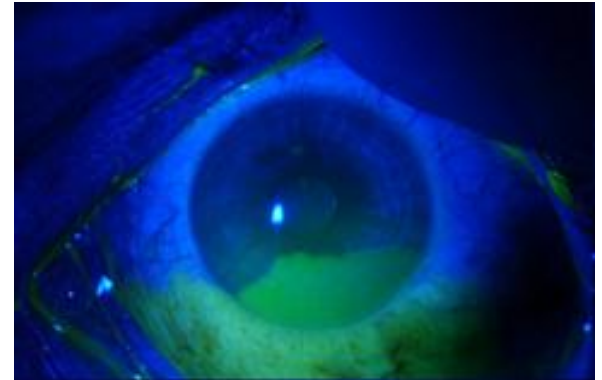
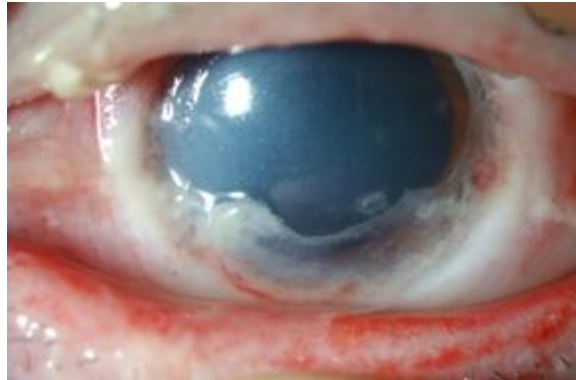
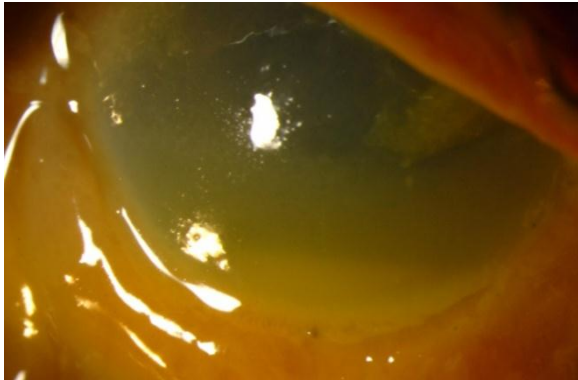
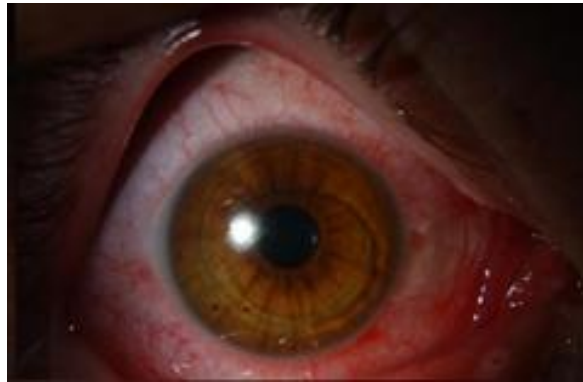
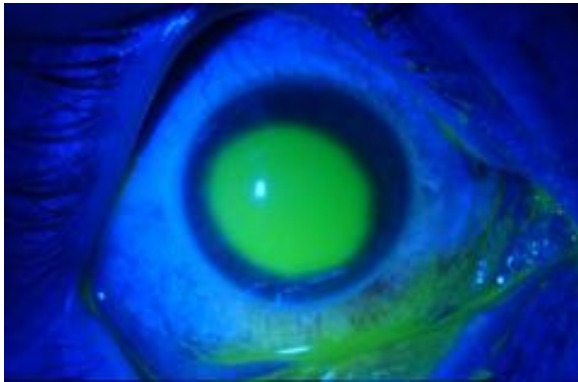


More obvious foreign bodies



CHEMICAL BURNS

- SIGHT THREATENING
- Acid vs Alkali



IMMEDIATE AND COPIOUS IRRIGATION

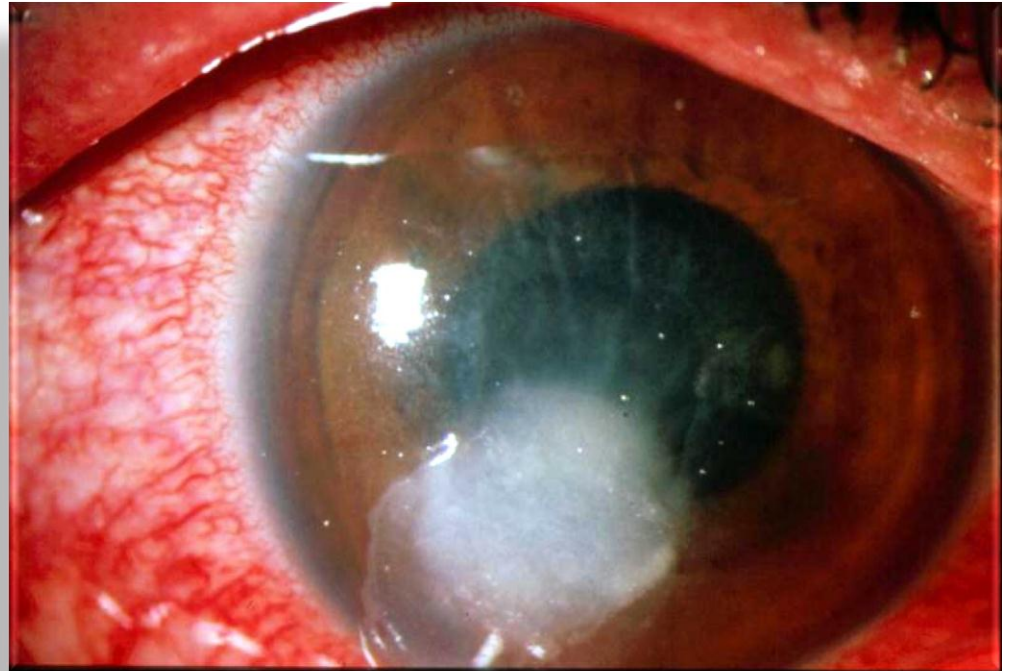


Rare trauma: male nurse red eye

- **History**
- 24 year old charge nurse in urology
- Overnight shift - struck in left eye by catheter wielding patient at 2am
- Attends same day at 6pm with red eye
- Watery discharge
- Vision slightly “fuzzy”

Catheter injury: signs

- VAR – 6/6
- VAL – 6/12
- Right eye white
- Left moderately red
- Minor discharge



Acute Red Eye – differential

1. Conjunctivitis
2. Corneal abrasion
3. Keratitis
4. Uveitis
5. Acute angle closure crisis
6. Scleritis / episcleritis
7. Subconjunctival haemorrhage
8. Ocular Trauma
9. Herpes zoster ophthalmicus

Acute Red Eye – differential

1. Conjunctivitis
2. Corneal abrasion
3. **Keratitis**
4. Uveitis
5. Acute angle closure crisis
6. Scleritis / episcleritis
7. Subconjunctival haemorrhage
8. Ocular Trauma
9. Herpes zoster ophthalmicus

Question 1 : It became worse after my bowel operation - diagnosis

- 23 year old female
- Sectorial redness 4/52
- Gritty
- 6/5
- Crohns disease



Q 14: Episcleritis clinical features

Which of the following statements is most true of episcleritis:

1. Usually self-limiting
2. Typically requires topical steroids
3. Frequently progresses to scleritis
4. Usually associated with systemic disease

Q 14: Episcleritis clinical features

Which of the following statements is most true of episcleritis:

1. **Usually self-limiting**
2. Typically requires topical steroids
3. Frequently progresses to scleritis
4. Usually associated with systemic disease

Case 9: Signs

- 70 year old female
- VAR 6/12
- VAL 6/36
- Red eye
- Poorly cooperative
- Appears dehydrated



Case 9. Differential Diagnosis

1. Microbial keratitis
2. Acute closed angle glaucoma
3. Acute anterior uveitis/iritis
4. Adenoviral keratoconjunctivitis

Case 9. Differential Diagnosis

1. Microbial keratitis
2. **Acute closed angle glaucoma**
3. Acute anterior uveitis/iritis
4. Adenoviral keratoconjunctivitis

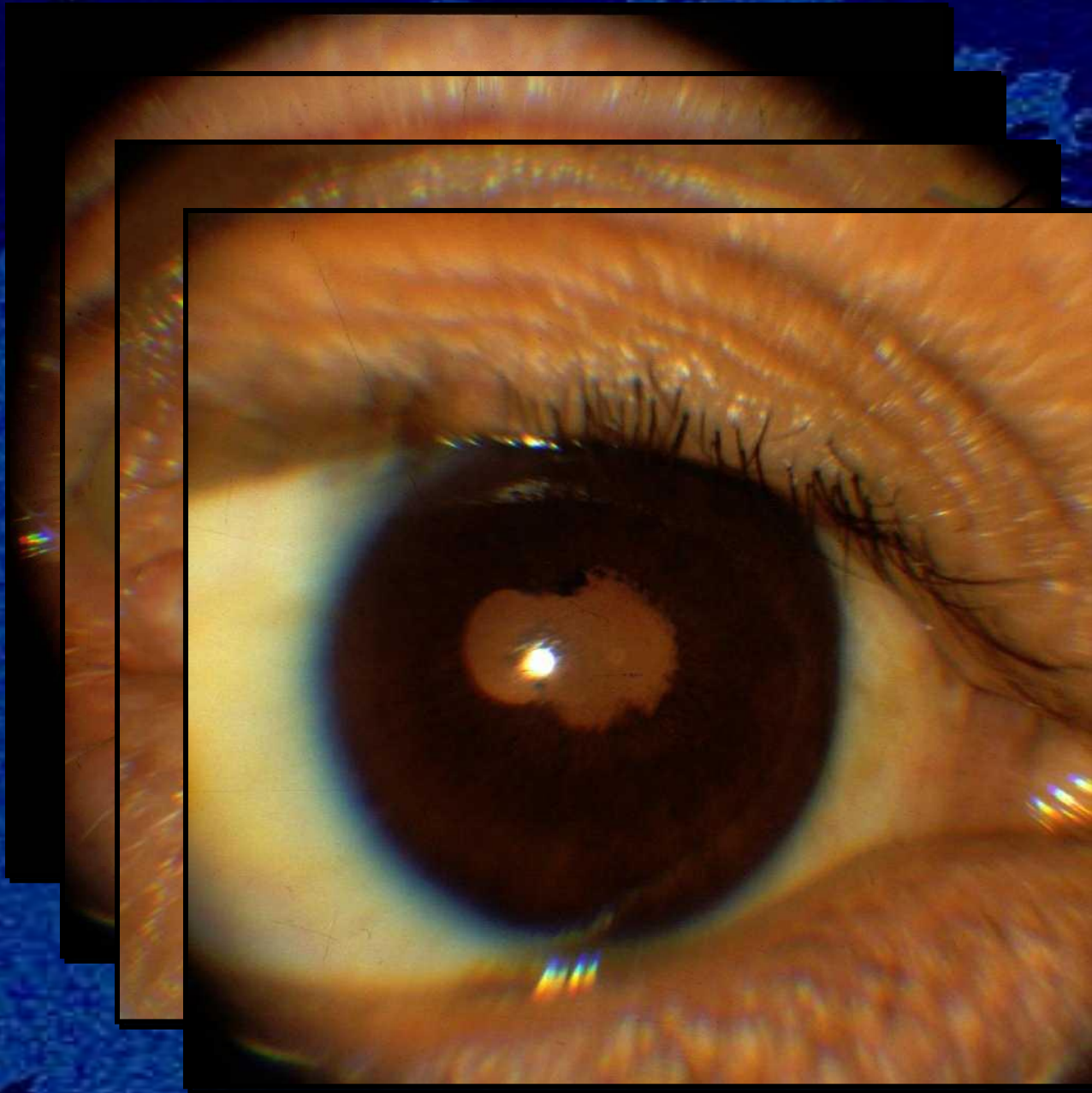
The Red reflex

Looking for
reflected
light from
the retina
as in a 'red
eye' seen
after a
camera
flash





Dial in plus lenses until a clear red reflex is seen



Opacities
such as
cataract will
cause
obscuration of
the red reflex

Illustrative Case 1



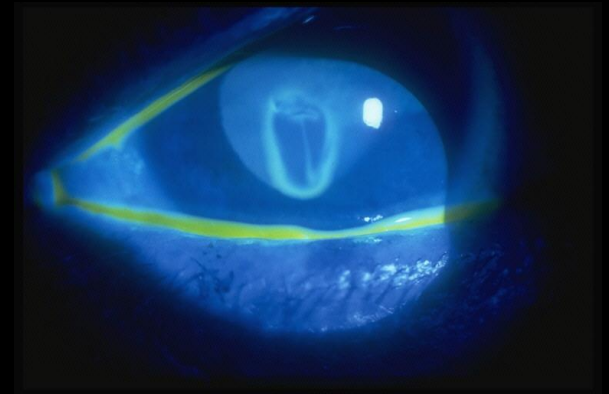
History

Examination

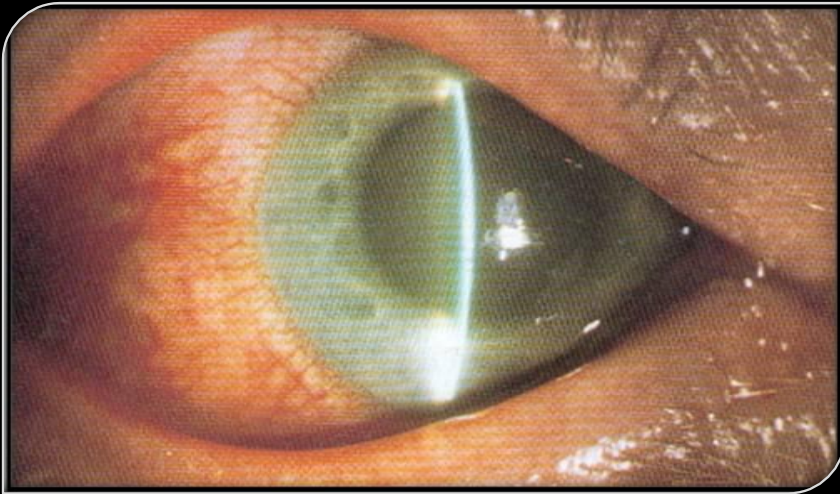
- Visual acuity
- Inspection (Anatomical approach)
 - Lid (laceration)
 - Conjunctiva (laceration)
 - Cornea (partial Vs full thickness)
 - Pupil (3Ss, direct + consensual reflex, RAPD)
 - Anterior chamber

Management

- NBM
- Tetanus PRN
- Place shield
- Ciprofloxacin Oral
- Refer



Illustrative Case 2



History

Examination

- Visual acuity
- Inspection (Anatomical approach)
 - Lid
 - Conjunctiva
 - Cornea (Fluorescein + Blue illumination)
 - Pupil (3Ss, direct + consensual reflex, RAPD)
 - Anterior chamber
 - Palpation

Management

- Refer

Acute angle closure glaucoma Vs Acute anterior uveitis

A good history helps in diagnosis:

Sudden onset of pain, redness and decrease in vision

Nausea, vomiting, headache

O/E: Fixed dilated pupil

Illustrative Case 4



History

Examination

- Visual acuity
- Inspection (Anatomical approach)
 - Lid (Entry site)
 - Conjunctiva (chemosis)
 - Cornea (Fluorescein + Blue illumination)
 - Pupil (3Ss, direct + consensual reflex, RAPD)
 - Anterior chamber
 - Ocular motility

Pre- Vs Post-septal cellulitis

Clues to suggest Orbital Cellulitis

Any recent URTI

General observation (Sick Vs well)

Chemosis

Abnormal ocular movement

Proptosis

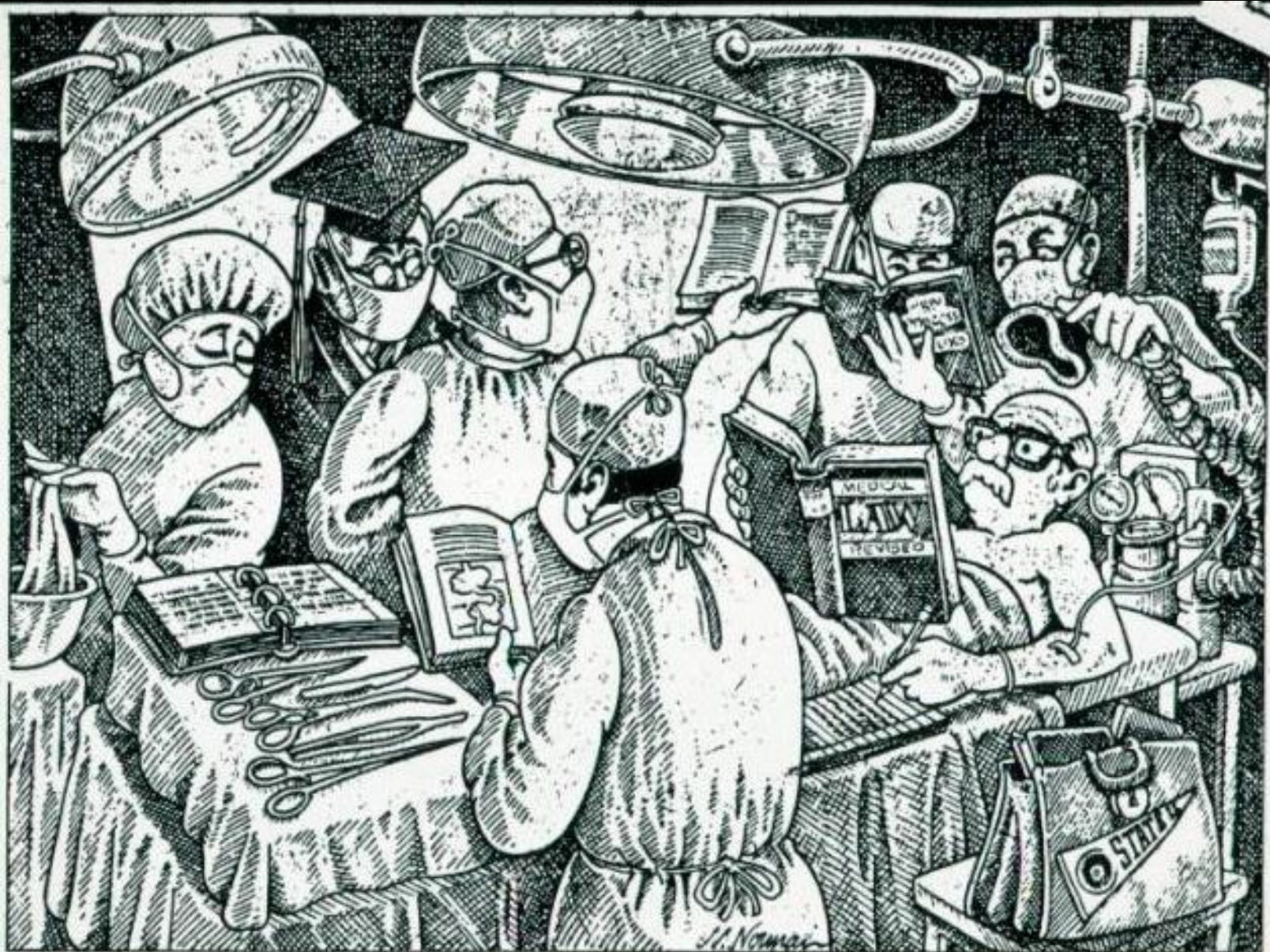
Management

Refer to paediatric service for admission

IV antibiotics

CT head + orbits with contrasts

Ophthalmology input



States Requiring Continuing Education for Professionals



nz national eye centre



**THE UNIVERSITY
OF AUCKLAND**

**FACULTY OF MEDICAL
AND HEALTH SCIENCES**

THANK YOU



nz national eye centre



**THE UNIVERSITY
OF AUCKLAND**

**FACULTY OF MEDICAL
AND HEALTH SCIENCES**