

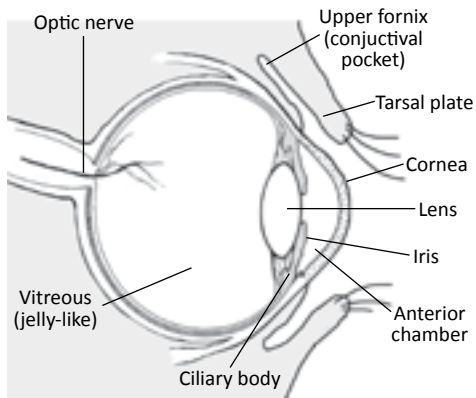
6 Eyes

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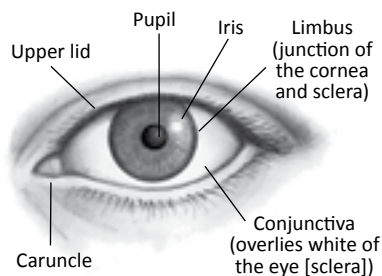
Eye examination



Anatomy of eye



6.1



6.2

Examination

Attention

Single red eye almost always due to

- Foreign body
- Corneal ulcer
- Acute glaucoma
- Trauma
- Iritis

- If chemical burn — finish washing eye (*p144*) before starting examination
- If you find anything abnormal or worrying — **specialist consult**
- To check eye properly you **need to evert eyelid** (*p138*)
- To wash out foreign bodies and/or chemicals, need to double evert eyelid (*p145*)

What you need

- 2.5 magnification head loupe (fits around head, used to see small objects), ophthalmoscope, slit lamp, or ear torch (otoscope)
- Bright torch (penlight)
- Wooden applicator stick or cotton bud (to evert eyelid)

What you do

Ask

- Problems with vision, eg double or blurred eyesight, flashes of light, small moving objects in vision (floaters), fuzzy lights around objects (haloes)
- History of eye trauma, surgery, cataracts, contact lenses etc

Check — both eyes

- Outside of eyelids and eyeball — swollen (oedema), red (erythema), sunken, pussy, teary, cuts and bruises
- **With upper eyelid everted** (*p138*)
 - Look for anything stuck to inside of eyelid or surface of eye (subtarsal and non-penetrating foreign bodies)
 - Check for trachoma follicles or scarring (*p139*)
 - Ask person to blink eyelid back to normal, or gently fold eyelid back down
- **Anterior eye**
 - Check covering surface of eye (conjunctiva) for redness, inflammation, jaundice, foreign bodies
 - Check lower eyelid for any redness or pus (discharge)
 - Check white of eye for redness or bleeding (subconjunctival haemorrhage)
 - If you can't see **back edge** of blood — F 6.3 — **medical or specialist consult**. May be skull fracture if trauma or history unclear
- **Cornea** — F 6.1 (*p136*)
 - From about 30cm, shine a bright light all over cornea, watch for light reflex — narrowing of pupil in response to light. Is cornea clear
 - If defect — light reflex will be broken up and uneven
 - If you suspect cut (abrasion) or defect or not sure — stain with **fluorescein** drops (*p146*)
- **Anterior chamber** — F 6.1 (*p136*)
 - Check for layer of blood (hyphema) or pus (hypopyon) — F 6.4
 - Where blood or pus settles depends on position head has been in. If person has been lying down, sleeping — settles on side of iris — F 6.5
- **Eye movement**
 - Ask person to look up, down, left and right
 - Difficulty looking up may mean cracks or breaks in bone around eye (orbital blow-out fracture)
 - Watch to see if both eyes move in same direction
 - Ask person if they get double vision while doing this
- **Pupils**
 - Check size, shape and reaction to light
 - Check for direct response — pupil with light shining in it quickly shrinks (constricts)
 - Check for involuntary (consensual) response — pupil **without** light shining in it shrinks same amount, at same time



6.3



6.4



6.5

For pupil reaction tests — ask person to look straight ahead into distance, shine bright test light into eye coming in from side and below line of sight.

• **Check for relative afferent pupillary defect**

- Shine light repeatedly from one eye to the other (swinging flashlight test). Count to 3 for each swing between eyes
- Look at pupil response as light moves onto each eye. Should be same for each pupil
- If one pupil gets bigger rather than staying small — relative afferent pupillary defect (RAPD). Optic nerve on this side not working properly
- If RAPD not noted before — needs to be followed-up to find cause

Single eversion of eyelid

Attention

- Use with every chemical injury, possible foreign body, trachoma check
- Very important to tell person what you are going to do, some people very sensitive to having eyelid everted. You will need their help

What you need

- Wooden applicator stick or cotton bud

What you do

- Person can sit or lie down. You sit or stand in front of them
- Ask person to tilt head back and **keep looking down**
- With one hand, take hold of eyelashes and gently pull eyelid forward. This breaks the suction between upper lid and eyeball — F 6.6
- With other hand, hold applicator stick across upper lid **above** lid fold — F 6.7
- Push down slightly on applicator stick and at same time pull upper eyelid out and up and back over stick
- When lid has been everted take applicator stick away and keep lid everted by holding lashes against eyebrow — F 6.8
- Tell person they will be more comfortable if they keep looking down. Ask them to try not to blink



6.6

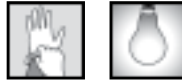


6.7



6.8

Simplified trachoma assessment and grading



Attention

- Each sign is reported separately, but can occur at same time, eg TF and TI

What you need

- 2.5 magnification head loupe (fits around head, used to see small objects)
- Good torch
- Wooden applicator sticks or cotton buds (to evert eyelids)

What you do

- Check for any in-turned eyelashes or corneal opacity (*p140*)
- Evert upper eyelids one at a time (*p138*) to check conjunctiva on stiff part of upper eyelid

Normal conjunctiva (F 6.9)

- Pink, smooth, thin, transparent. Normally has large, deep-lying blood vessels that run up and down (vertically)



6.9

Trachomatous inflammation — Follicular = TF — F 6.10

- Five or more follicles seen on conjunctiva
- Follicles are grey, white or yellow round swellings, paler than surrounding conjunctiva
- Follicles must be at least 0.5mm in diameter to be considered trachomatous inflammation



6.10

Trachomatous inflammation — Intense = TI — F 6.11

- Lot of inflammation and thickening of conjunctiva that obscures more than half the deep-lying blood vessels
- Conjunctiva looks red, rough and thickened
- Usually many follicles partially or totally covered by thickened conjunctiva



6.11

Trachomatous scarring = TS — F 6.12

- Conjunctiva scarred following trachomatous inflammation



6.12

- Scars easily seen as white lines, bands or sheets, glistening and fibrous in appearance
- Scars may completely obscure deep-lying blood vessels

Trichomatous trichiasis = TT — F 6.13

- One eyelash rubbing on eyeball and/or evidence of recent removal of in-turned eyelash

Corneal opacity = CO — F 6.14

- Corneal opacity easily seen covering pupil



6.13



6.14

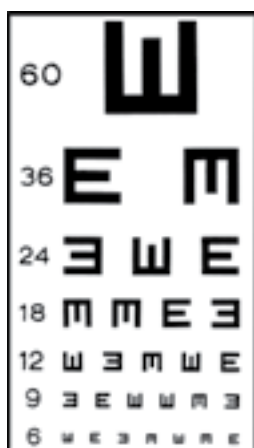
Checking near and distance vision

Attention

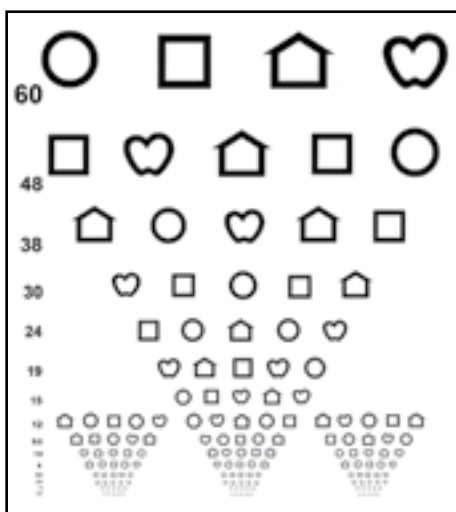
- Aim to find best vision person can manage
- Report any loss of vision to specialist

What you need

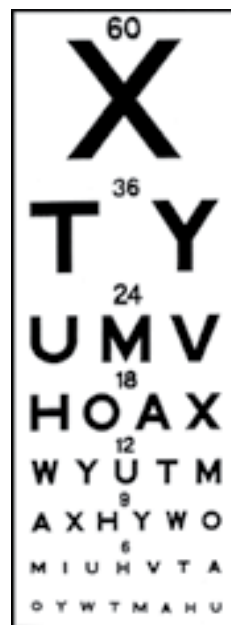
- Near-point chart for reading vision
 - *OR* Use large, medium and small print in this manual
- Chart for distance vision — 6 or 3 metres
 - Illiterate E — F 6.15, Lea — F 6.16, Snellen (letters) — F 6.17
- Pinhole occluder
- Eyepad, optional



6.15



6.16



6.17

What you do

Check NEAR vision first

- If person normally wears glasses for near tasks — do test with glasses on
- Ask person to keep both eyes open
- Have them hold near-point chart (or this manual) at distance they would normally hold things to read or do near tasks — usually 30–40cm
- Record in file notes N point score of smallest sized print they can read correctly, eg Near vision = N8 with glasses. See Table 6.1 (p142)
 - Record if wearing glasses, contact lenses, unaided
- Some charts have N point score, eg N5, N6, N8, *OR* Snellen equivalent such as 6/9

Table 6.1: Near point scores

N point score	Common use
3	Medicine bottle labels
5	Footnotes
6	Telephone directory
8	Newspaper print
10	Typewritten
16	Computer display
65	Newspaper headlines

Check DISTANCE vision (visual acuity) next

Vision recorded as a fraction

- First number (numerator) is always 6 — the testing distance
 - Also applies to 3 metre charts as size of chart and distance away are proportionally the same
- Last number (denominator) is **smallest line** of text or symbols person can read off chart (lines are numbered)

- Put chart being used against wall, measure and mark spot on floor — 6 metres out from 6 metre chart *OR* 3 metres out from 3 metre chart
- If person has problem with one eye — test good eye first
- If person normally wears glasses — do test with their glasses on
- Ask person to cover one eye completely with hand or piece of thick card. Make sure they are not peeping between their fingers
- Ask them to start reading from top line on chart and continue down *OR* ask them to read smallest line they can
 - If using Illiterate E chart, ask person to show, with fingers of their spare hand, which way 'legs' of the 'E' are pointing
- Record in file notes last **complete line** person able to read. If they read all of line '18' but can only read 3 letters of line '12' line — record vision as 6/18+3
 - Record if wearing glasses, contact lenses, unaided
- Do again with other eye

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If vision worse than 6/6 (normal vision) — do test again with pinhole occluder

If you don't have made-up occluder — F 6.18, pierce sheet of paper with 19G needle or use earpiece with an opening of about 1mm.

- Cover one eye — can tape pad over eye
- Ask person to hold occluder over other eye and look at chart through pinhole
- Repeat visual acuity test
- **If person can't see top line of eye chart (6/60)**
 - Ask person to count fingers on your hand, while you gradually move closer to them (from 6 metres to 1 metre)
 - Note greatest distance at which they can count fingers as 'CF at (number of) metres' eg able to CF at 4m (V = CF 4m)
- **If person can't count fingers**
 - Ask person if they can see hand movement, while you gradually move closer to them (from 6 metres to 1 metre)
 - Note greatest distance at which they can see hand movement as 'see HM at (number of) metres', eg able to see HM at 1m (V = HM 1m)
- **If person can't see hand movement**
 - Check if they can see any light at all
 - Note whether 'LP' (light perception) or 'NLP' (no light perception)
- Do this again with other eye
- Record if wearing glasses, contact lenses, unaided



6.18

When using pinhole occluder

- If person has optical or refractive error — vision should get better
- If person has organic ocular condition — vision may not get better

Eye procedures



Putting in eye drops and ointments

Attention

- Make sure tip of bottle/tube kept clean and doesn't touch eyelid, eye or lashes

What you do

- Ask person to lift chin and look up
- Pull down lower lid so **pouch forms**, put drops — F 6.19 or ointment — F 6.20 in pouch
- Write date opened on bottle. Throw away when treatment finished or after manufacturer's recommended time (usually on bottle)



6.19

Washing (irrigating) eye — to remove burning chemical

Attention

- **Do not** try to neutralise alkali or acid burn with chemical antidote. Always use water or **normal saline**
- **Watch for breathing problems** (respiratory distress) from soft tissue swelling in upper airways after chemical burn to eye
- **Do not** give person local anaesthetic eye drops to take away and use. Will not be able to feel further injury or damage



6.20

What you need

- Helper
- **Normal saline** connected to IV giving set *OR* tap water in bottle, cup, syringe etc
- U/A test strip (showing pH) or litmus paper
- Local anaesthetic eye drops, eg **oxybuprocaine**, **amethocaine**
- Sterile cotton bud
- **Fluorescein** stain

What you do

- Start washing (irrigating) affected eye/s **immediately**
- Tell person to blink. Gets chemical out from under eyelid

- **If outside clinic**

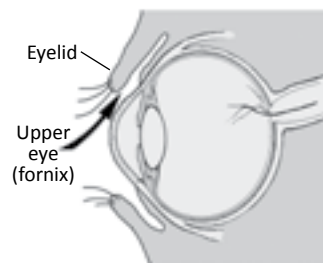
- Hold eyelids apart, use gentle flow of water over eye from inside to outside — F 6.21



6.21

- **If in clinic**

- Give person or helper bottle or cup of water to start irrigating eye. Tell them to keep doing this until you are ready
- Put in anaesthetic drops
- Set up IV giving set with 1L warmed **normal saline**
- Hold eyelids apart, use gentle flow of **normal saline** over eye from inside to outside — F 6.21
- **Do not** poke or touch anaesthetised eye. No blink reflex
- Do single eversion of eyelid (*p138*), then **double eversion** if you can (*below*). Wash under eyelid to reach upper eye (fornix) — F 6.22
- Gently pull down lower lid and wash white of eye
- Use moist cotton bud to remove any specks on eye surface, or matter in corners of eye
- For alkali burns, eg lime, bleach, cement
 - Will keep burning until completely removed
 - **Irrigate for 1 hour**
 - If litmus paper or U/A test strip available — test pH by touching on eyeball (conjunctiva). Re-check after each 1L fluid
 - Stop irrigation when pH normal (about 7.5) in all parts of eye, including under eyelid
 - If pH testing not available — keep irrigating
- Check vision (*p141*)
- Put in **fluorescein** stain (*p146*), look for eye surface (cornea) damage
 - Serious injury may just look like heavy **fluorescein** layer (green stain). May need to put **fluorescein** stain in good eye to compare
- **Specialist review as soon as possible**



6.22

Double eversion of upper eyelid

Used when very top of eyeball needs to be seen or irrigated, eg for chemical burns or objects on eye surface that can't be seen with single eversion.

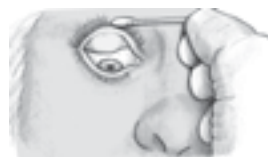
Attention

If emergency, eg chemical burn — keep irrigating until you put in anaesthetic drops. Do procedure as quickly as possible so you can start irrigating again.

- Procedure very painful — **always** use anaesthetic drops. Take about 2 minutes to work properly

What you need

- 2 sterile cotton buds
- Local anaesthetic eye drops, eg **oxybuprocaine**, **amethocaine**



6.23

What you do

- Put in local anaesthetic eye drops and wait 2 minutes (if not an emergency)
- Do single eversion of eyelid (p138) — F 6.23
- Take second cotton bud and lift lower edge of inner eyelid — F 6.24 so you can see very top of eyeball — F 6.25
- Lid will not stay in place on its own. Hold it up with cotton bud as you irrigate or take out foreign body



6.24

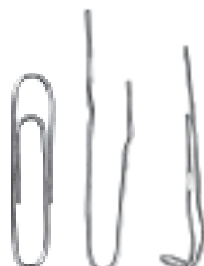


6.25

Making emergency eye lid retractor

Attention

- Safely made from standard sized paper clip
- Gives good view of cornea and eye ball, unless serious swelling
- Surface of eye not sterile, so retractor unlikely to introduce contaminants



6.26

6.27

6.28

What you need

- Standard sized paper clip — F 6.26

What you do

- Fold out ends of paper clip — F 6.27
- Turn up curved end — F 6.28
- Wipe clip with sterile wipe, let dry
- Use clip to hook up eyelid — F 6.29



6.29

Using fluorescein stain

Attention

- Store **fluorescein** drops in refrigerator. Warm to room temperature before use

What you need

- 10–20ml **normal saline** in 20ml syringe

- **Fluorescein sodium 2%** drops
- *OR* **Fluorescein sodium** ophthalmic strips, eg *Fluorets*
- Ophthalmoscope. Blue filter is best, then green
 - *OR* Bright light source, eg pencil torch
- Sterile gauze swabs

What you do

- If pus or watery discharge — wash eye with **normal saline**
- Warn person that **fluorescein** may sting eye
- Put 1–2 drops **fluorescein** in small 'pouch' made in lower lid. **Do not** put straight onto cornea
- *OR* Use **fluorescein** strip. Add drop of **normal saline** or anaesthetic to tip then touch to inner side of lower lid
- Ask person to blink
- Look at cornea with blue or green filter on ophthalmoscope, or bright light
- **If new corneal injury or defect** — will be pooling of bright, lime green colour (staining) in that area

• Penetrating eye injury will show fluid leak washing away **fluorescein** stain (waterfall effect). **Medical consult** straight away

- Old scarred corneal injuries usually don't stain
- Record in file notes. Draw size, shape, position of injury
- Gently wash eye with **normal saline** to remove **fluorescein** stain

Taking object off eye surface using irrigation or cotton bud

Attention

- **Check that object not sticking into eye.** **Do not** do this procedure if you think it is
- If object within 4mm of pupil — needs to be removed in hospital
- **Do not** give person local anaesthetic eye drops to take away and use. Will not be able to feel further injury or damage

What you need

- 2.5 magnification head loupe (fits around head, used to see small objects)
- Bright light
- **Normal saline** in 20ml syringe or IV giving set. Use tap water in an emergency
- Sterile cotton bud, wet with **normal saline** or anaesthetic drops
- Local anaesthetic eye drops, eg **oxybuprocaine**, **amethocaine**
- Antibiotic ointment, if needed
- Eye pad, tape

What you do

- Check vision (*p141*)
- Look for other signs of injury, make sure object isn't sticking into eye
- Lie person down comfortably. Stabilise head, use foam head ring if available
- Use magnification head loupe to magnify area
- Angle bright light at 45° to surface of eye
- Evert upper eyelid (*p138*), look for foreign body/s
- Pull down lower eyelid, hold upper and lower eyelids apart
- Wash eye (*p144*) to remove small objects not sticking to eye (non-adherent)
- Lift off objects sticking to eye surface with moist cotton bud
- If this doesn't work — put in 2 drops of local anaesthetic eye drops, wait a few minutes for them to work
- Do single (*p138*) or double (*p145*) eversion of eyelid. Sweep around under lid with wet cotton bud
- If you remove object
 - Check vision again (*p141*)
 - Put in **fluorescein** stain (*p146*), check for surface (corneal) damage. Will usually be small area
 - Wash out **fluorescein** stain with **normal saline**
 - Put in antibiotic eye ointment, if needed
 - Put on eye pad (*p149*)
 - Ask person to come back next day for check
- If you can't remove object
 - Talk with specialist
 - *OR* If trained — see *Taking object off surface of eye using needle (below)*

Taking object off eye surface using needle

Attention

- **Do this only when other methods have not worked**
- Cornea is tough. You will need firm steady approach to remove foreign body
- Make sure you remove all of foreign body, not just a small piece

What you need

- 2.5 magnification head loupe (fits around head, used to see small objects)
- Local anaesthetic eye drops, eg **oxybuprocaine**, **amethocaine**
- 23G needle on 2ml syringe (to use as handle)
- Antibiotic ointment or drops, eg **chloromycetin**

What you do

- Check vision (*p141*)
- Put in local anaesthetic eye drops, wait 2 minutes
- Put on magnification head loupe
- Put needle firmly onto 2ml syringe
- Ask person to stare into distance, try to keep other eye open. Lessens eye movement
- Hold eyelids apart to stop blinking
- Brace hand holding syringe against side of head
- Put needle flat on cornea with **bevel facing away from eye surface** (cornea) to stop it scratching or sticking in (penetrating)
- Scrape an area slightly larger than object
- Gently lift edge of object with bevel, then lift object up and off eye surface — F 6.30
- Check vision again (*p141*)
- Put in **fluorescein** stain (*p146*), look for surface (corneal) damage. Some is expected
- Wash out **fluorescein** stain with **normal saline**
- Give antibiotic ointment or drops to prevent secondary ulceration. Use whether or not you were able to remove foreign body
- Put on eye pad to protect eye while numb (*below*)
- Ask person to come back next day for check
- **If you can't remove object — specialist consult**



6.30

Putting on eye pad

Eye pad used to

- Keep eyelids from moving over injured area and causing pain and friction
- *AND/OR* To protect eye after anaesthetic drops (eg in dusty environment), to keep light out of pupil dilated with drops

Attention

- **Always** use pad on anaesthetised eye
- **Do not** use pad on eye with bacterial or viral infection, eg ulcer, iritis, conjunctivitis
- Use eye shield to protect eye from compression, or if you suspect perforation
- 'Good' pad is comfortable but firm enough to stop eyelid movement, taped on securely
- Make sure skin around eye clean and dry before using tape

What you need

- 2 clean/sterile gauze eye pads. Can use ordinary gauze swabs folded in half
- *OR* 1 gauze eye pad and 1 plastic eye shield (pressure patch) with elastic strap
- 25mm paper tape

What you do

- Fold 1 gauze eye pad in half
- Ask person to keep both eyes closed. Put folded eye pad over injured eye — F 6.31
- Hold folded pad in place (person can do this)
- Put second pad over top — F 6.32
 - Tape pad from forehead to top of cheek as tightly as possible with enough tape to cover whole pad. Check it's comfortable
- *OR* Cover with plastic shield and tape in place — F 6.33. Make sure it isn't too tight
- Change pad every 24 hours

Note: If you don't have eye shield — make one using polystyrene cup — F 6.34, F 6.35.



6.31



6.32



6.33



6.34



6.35

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