



EYE DISORDERS IN PRIMARY CARE

JESHNI AMBLUM-ALMER



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WHAT IS THE EYES MAIN FUNCTION?

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VISION

History Taking

Presenting
Complaint

History of
presenting
complaint

Past medical
history

Past ocular
history

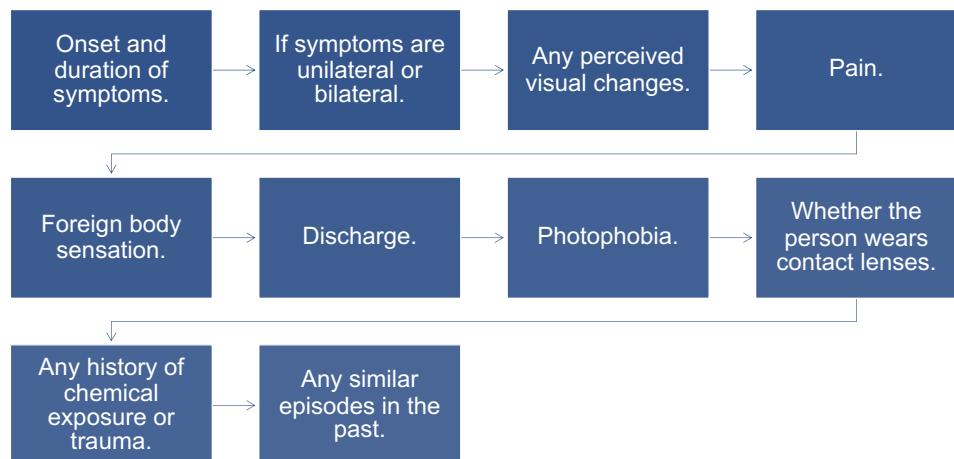
Family
ocular
history

Medications

Allergies

Social
including
work

History



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History

- Past medical history including:
 - History of atopy, allergy and similar episodes.
 - Immunocompromise for example HIV, chemotherapy or immunosuppressant therapy.
 - Systemic conditions which can present with clinical features of conjunctivitis such as rheumatoid arthritis, Sjögren syndrome, systemic lupus erythematosus, and reactive arthritis.
 - Ophthalmic surgery. Past Ocular History
 - Past medical history of hypertension or any medical conditions associated with the causes of red eye, for example, connective tissue disorders.
 - Medication (for example use of eye drops). If subconjunctival haemorrhage is suspected determine if the person is taking an anti-coagulant.

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Social History : Smoking, Alcohol, hobbies, job, exercise, sexual health

Family History : Any family history of glaucoma at a young age

Systems Overview: Consider conditions

Cardiac – changes in blood flow can result in small retinal haemorrhages and glaucomatous neuropathy.

GCA – early symptoms are thirst.

Respiratory – Oxidative stress- unstable oxygen supply in sleep apnoea. Macular oedema in hypoxia.

Diabetes: diabetic retinopathy – leakage onto the retina can result in vision loss

Hypertension – damage to vessels around the eye

Dermatology : Shingles, Lyme disease causes uveitis, rosacea can cause dry eyes

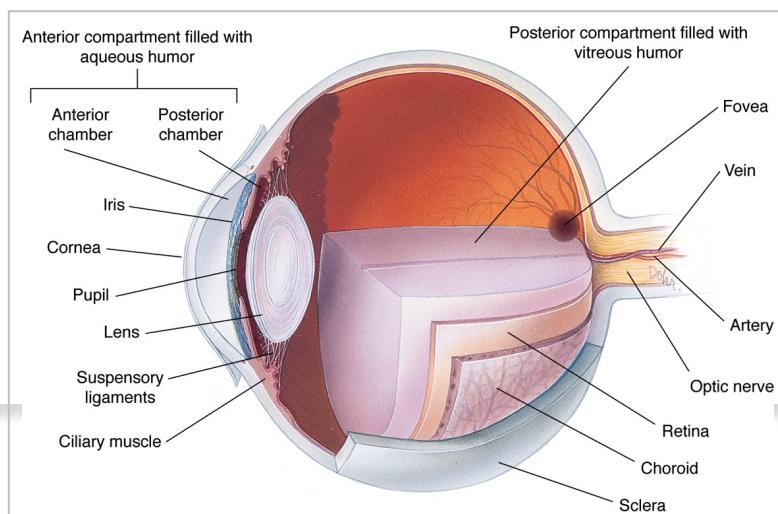
Gastrointestinal : Liver disease can cause eye dryness and fat collections around the eyelid. Vitamin A deficiency.

Haematological : Sickle cell disease – abnormal shaped red blood cells can result in damage to blood vessels in the eye.

Autoimmune : Red eyes, dry itchy eyes. Consider arthritis, SLE,

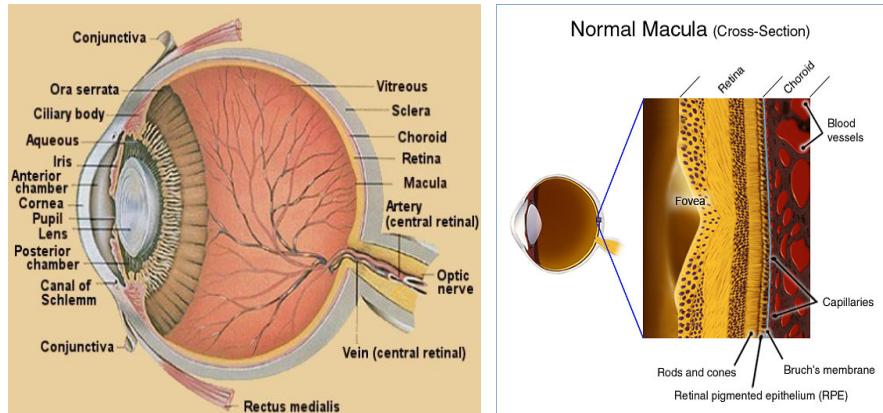
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Anatomy and Physiology of the Eye

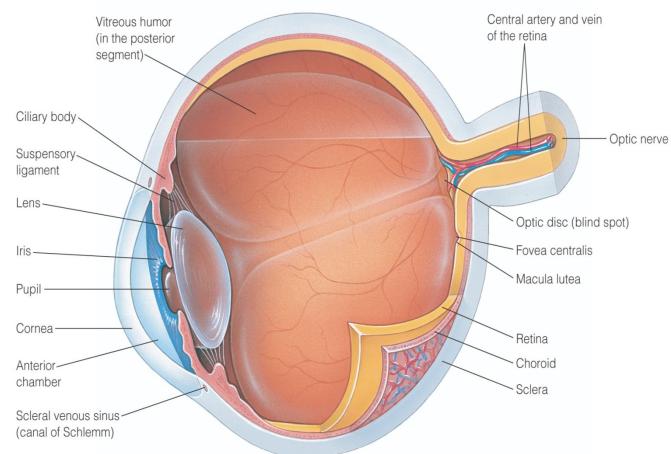


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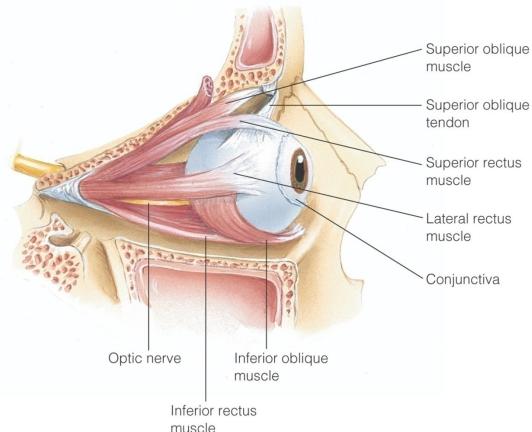
ANATOMY OF THE HUMAN EYE



INTERIOR OF THE EYE



EXTRAOCULAR MUSCLES

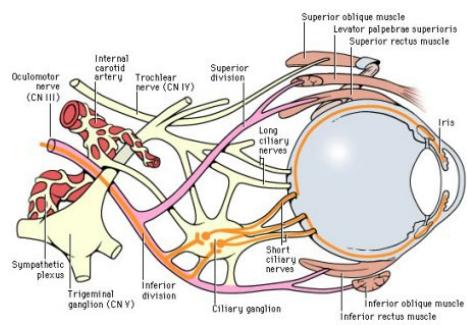


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Nerve Supply to the Eye

- Optic Nerve
- → CN II
- Oculomotor Nerve
 - → CN III
- Trochlear Nerve
 - → CN IV
- Abducent Nerve
 - → CN VI

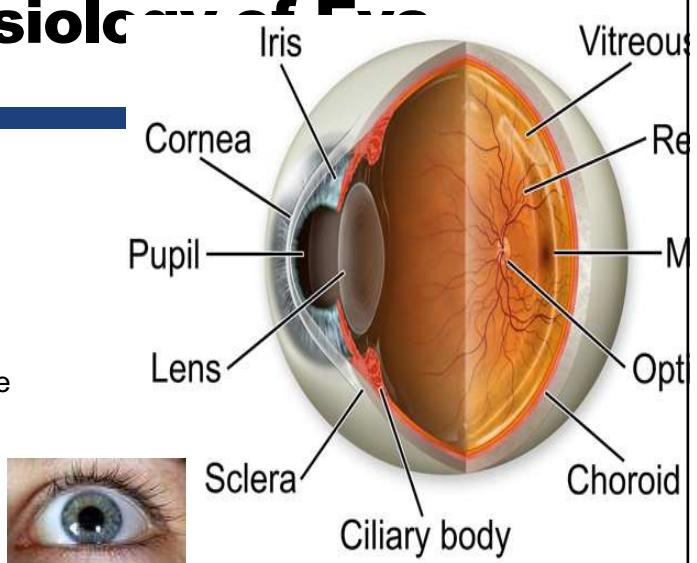


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Anatomy & physiology of Eye

Anatomy & physiology

- Human eye
- Diameter 23 mm
- Consist 3 layers-
- Outermost coat : The clear, transparent cornea and the white, opaque sclera.
- Middle layer : The iris anteriorly, the choroid posteriorly, and the ciliary body at the intermediate part.
- Inner layer : Retina (extension of CNS).



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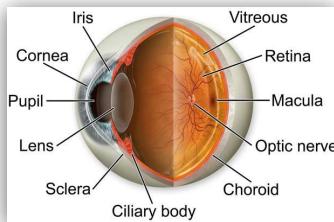
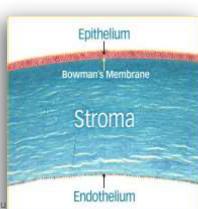
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The Cornea:

- The cornea is transparent and allows light to enter the eye. It is a powerful refracting surface, providing much of the eye's focusing power.
- Epithelium-stroma-endothelium (fat-water-fat structure).
- Penetration of the drug depends on oil-water partition coefficient. The sclera: The protective outer layer of the eye, referred to as the "white of the eye" and it maintains the shape of the eye.

The choroids

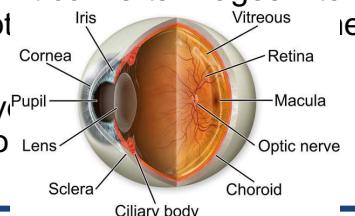
is the second layer of the eye and lies between the sclera and the retina. It contains the **blood vessels** that provide **nourishment to the outer layers** of the retina.



The iris is the part of the eye that gives it color. It consists of muscular tissue that responds to surrounding light, making the pupil opening in the center of the iris, larger or smaller depending on the brightness of the light.

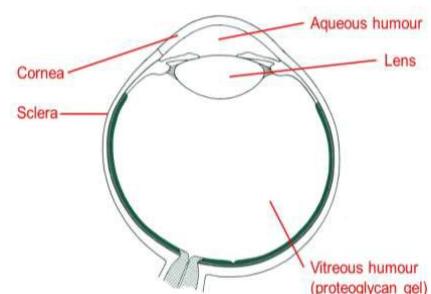
- The **lens** is a transparent, biconvex structure, encased in a thin transparent covering. The function of the lens is to refract and focus incoming light onto the retina.
- The **retina** is the innermost layer in the eye. It converts images into electrical impulses that are sent along the optic nerve where the images are interpreted.
- The **macula** is located in the back of the eye. This area produces the sharpest vision.

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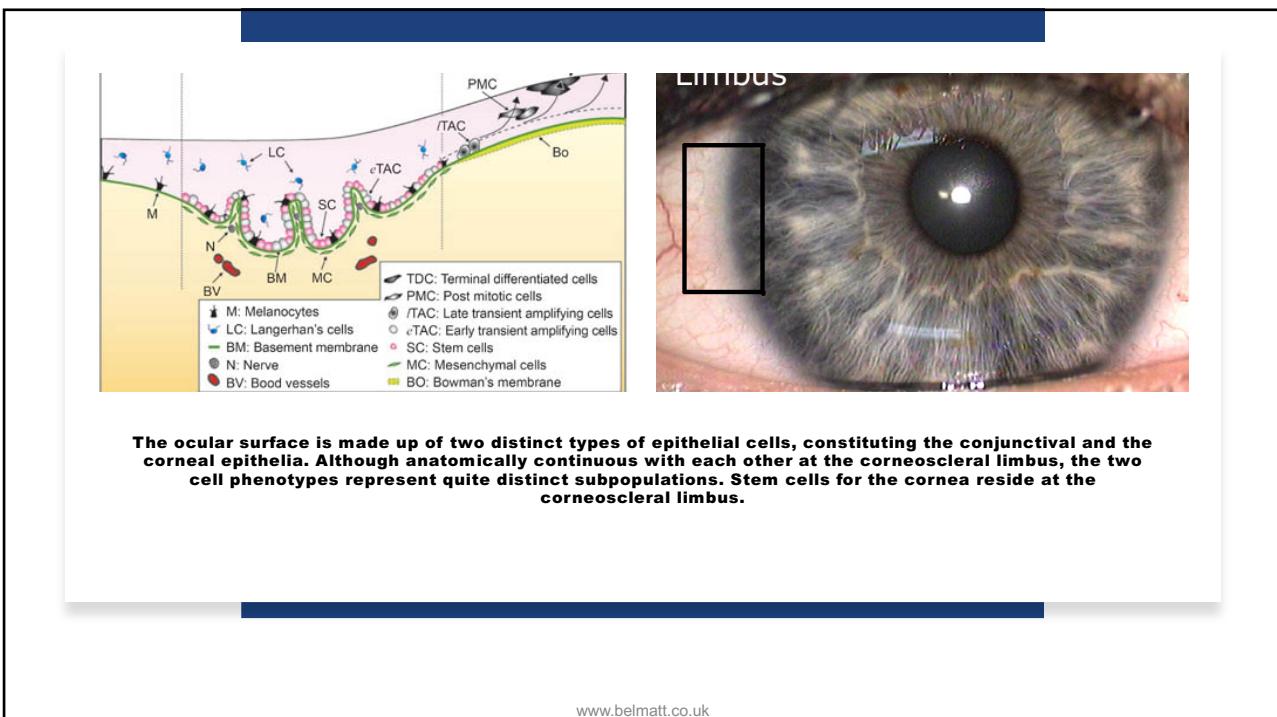
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- The inside of the eyeball is divided by the lens into two fluid-filled sections.
- The largest section at the back of the eye is filled with a colourless gelatinous mass called the vitreous humour.
- The smaller section in the front contains a clear, water-like material called **aqueous humor**.
- The **conjunctiva** is a mucous membrane that begins at the edge of the cornea and lines the inside surface of the eyelids and sclera, which serves to lubricate the eye.
- **Lacrimal glands**
- Secrete tears & wash foreign bodies.
- Moistens the cornea & prevent drying out



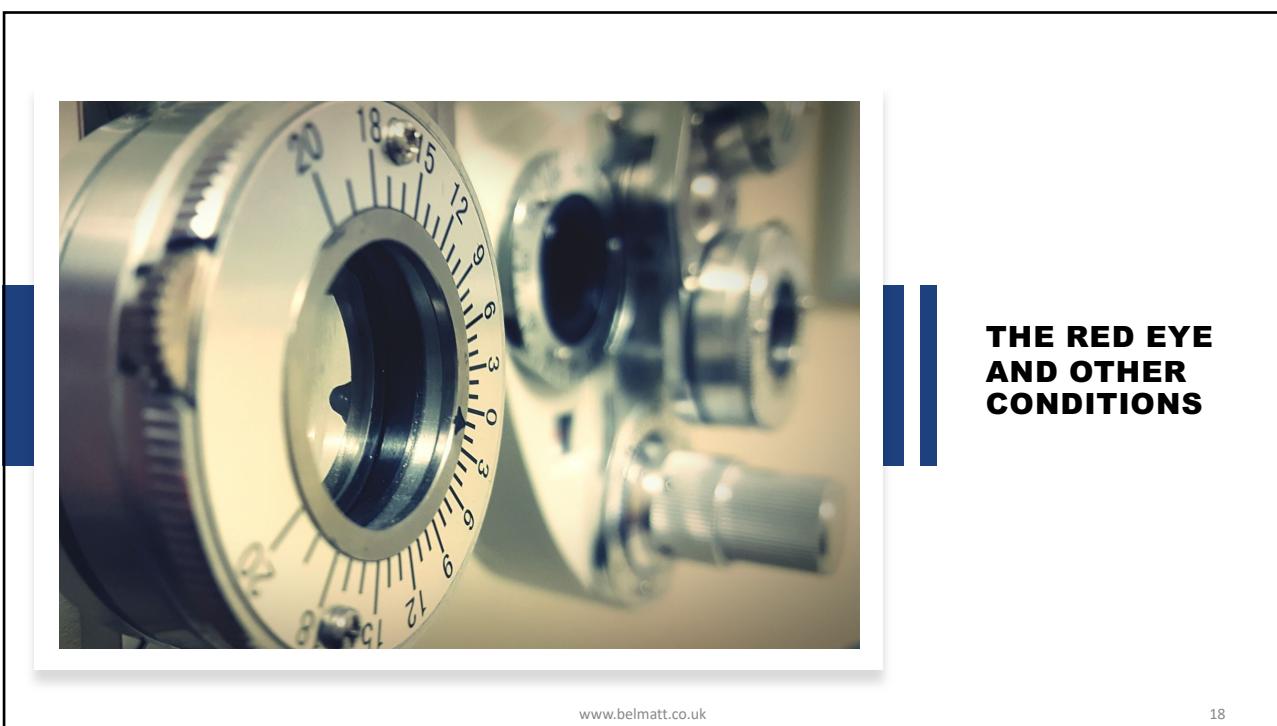
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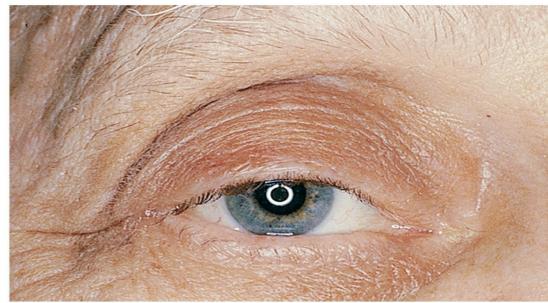
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What is this?

Think about which conditions would predispose you to this.



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Blepharitis

Blepharitis is an inflammatory eyelid condition caused by chronic staphylococcal infection and malfunction of the meibomian (lipid) glands.

It can cause secondary conjunctivitis and dry eye, and occasionally small corneal ulcers.

Treatment

Give patient blepharitis information leaflet

Eyelid hygiene – explain to patient how to perform this

If severe blepharitis, prescribe chloramphenicol ointment 1% twice daily for one week, to be applied to eye lid margins after cleaning

Ensure patient is informed that blepharitis is a chronic condition and that they need to clean their lids twice a day once current inflammation has settled

Review as appropriate

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STYLE



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STYLE

style (hordeolum) is an acute infection of one or more of the glands at the edge of the eyelid or under it.

Causative organism - staphylococcal infection.
Abscess forms and tends to rupture, releasing a small amount of pus. Lasts 2 to 4 days.

S&S :A redness, tenderness, and pain at the edge of the eyelid. Then a small, round, tender, swollen area forms.
Becomes watery and sensitive to bright light. Feels like FB
Rarely, a stye forms in one of the deeper glands

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Stye Treatment

Apply hot compresses for 10 minutes several times a day followed by a gentle eyelid massage. The warmth helps the stye come to a head, rupture, and drain.

Internal stye may need I&D

Give patient stye information leaflet

Epilate the lash from the affected follicle with a pair of fine tweezers and prescribe chloramphenicol ointment three or four times daily for one week

A warm compress

It is very rare to require surgical drainage

If there is definite spreading cellulitis in the lid, it requires oral antibiotics (eg coamoxiclav)

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Stye

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Chalazion

Chalazion is a firm round lump in the upper or lower eyelid caused by a chronic meibomian gland.

Unless acutely infected, it is harmless inflammation/blockage of the meibomian gland.

Unless acutely infected, it is harmless

Nearly all resolve if given enough time

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Chalazion

Eye examination

Examine lids and conjunctiva with a white light
Often red around chalazion, but watch out for spreading lid cellulitis

Treatment

Give patient chalazion information leaflet

Show patient how to apply a warm compress (see page 9)

If acutely inflamed, prescribe chloramphenicol ointment three times daily for one to two weeks

Chalazia will often disappear without further treatment within a few months

If conservative therapy fails, chalazia can be treated by surgical incision (incision and curettage under local anaesthetic)

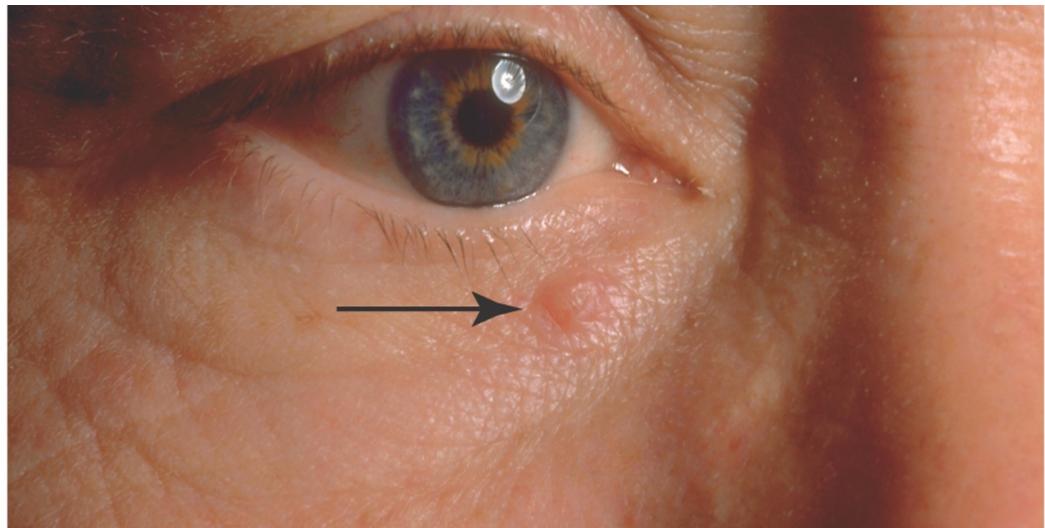
Refer if recurrent in same location or loss of lashes

Complications: Astigmatism due to pressure on cornea.

If recurrent consider sebaceous cell carcinoma

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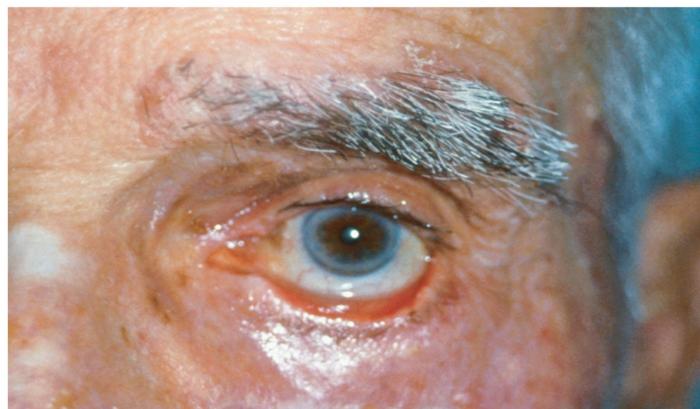
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EYELID DISORDERS

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ECTROPIAN

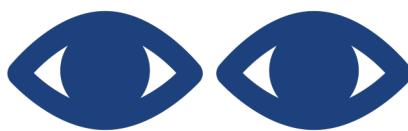


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Dry Eyes



Observe lids, conjunctiva and cornea with white light
Instil 1 drop of proxymethacaine 0.5% with fluorescein 0.25%
Observe for corneal staining preferably using a blue light
consider Schirmer tear test (wetting of tear test strip in five minutes, <5–7mm abnormal)

Treatment

Tear substitutes: mild to moderate cases of dry eye syndrome can usually be successfully treated using over-the-counter artificial tear drops; if a patient has severe symptoms and needs to use eye drops more than six times a day, or if they wear contact lenses, advise them to use preservative-free eye drops
Eye ointment can also be used to help lubricate eyes, but it can often cause blurred vision, so it is probably best used only at night
More severe cases may require specialist medication or lacrimal punctal plugs

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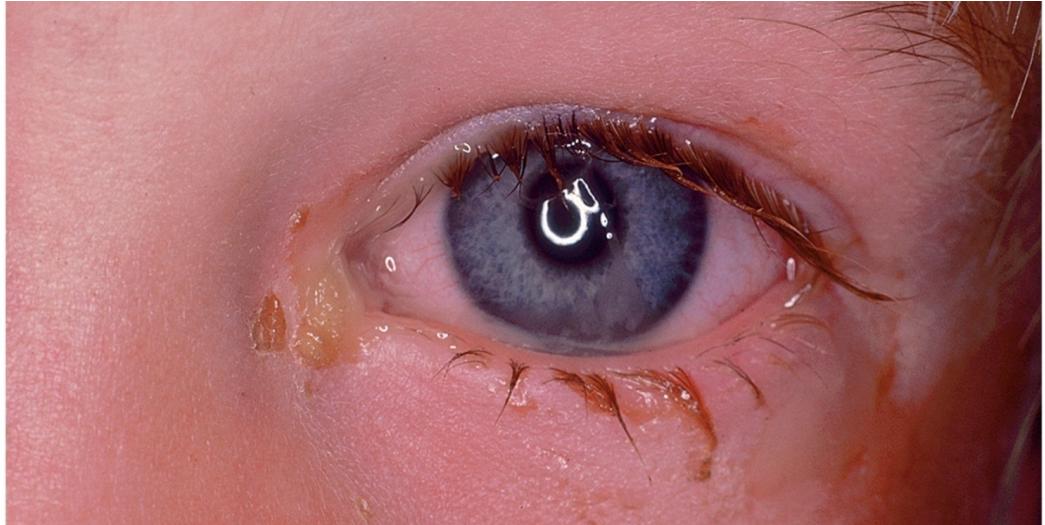
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ENTROPIAN III

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Bacterial Conjunctivitis

Advise the person that most cases of bacterial conjunctivitis are self-limiting and resolve within 5–7 days without treatment.

Treat with topical antibiotics if severe or circumstances require rapid resolution. A delayed treatment strategy may be appropriate — advise the person to initiate topical antibiotics if symptoms have not resolved within 3 days. Options for topical antibiotics include:

Chloramphenicol 0.5% drops — apply 1 drop 2 hourly for 2 days then 4 times daily for 5 days.

Chloramphenicol 1% ointment — apply four times daily for 2 days, then twice daily for 5 days.

Fusidic acid 1% eye drops — can be used second line. Apply twice daily for 7 days.

	Bacterial	Viral	Allergic	Chlamydial
Pain	FB sensation	Sore & uncomfortable	Intense irritating itching	FB sensation & irritation
Discharge	Mucopurulent	Watery, straw coloured	Clear, watery, stringy	Mucopurulent
Eyelids	Crusted, mild swelling	Swelling when severe	Moderate swelling, red	Crusted, mild swelling
Conj	Red NB inside lids	Follicles, diffuse redness, chemosis	Papillae, diffuse redness, chemosis	Red, follicles
Cornea	Clear	Small sub epithelial opacities	Clear	Clear but may get superficial punctate keratitis
Systemic	Nil	Possible upper respiratory infection	Possible hay fever, nasal symptoms, asthma, eczema	Genito-urinary symptoms may be present. Sexually active



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Viral Conjunctivitis

- Viral conjunctivitis is the most common infectious conjunctivitis —the majority of cases are caused by adenoviruses.
- The most common bacterial causes of conjunctivitis are *Streptococcus pneumoniae*, *Staphylococcus aureus* and *Haemophilus influenzae*.
- Hyperacute conjunctivitis is a rapidly developing severe conjunctivitis typically caused by infection with *Neisseria gonorrhoeae*.
- Ophthalmia neonatorum (ON) is occurring with conjunctivitis in the first four weeks of life —it can be infectious or non-infectious.
- Acute conjunctivitis is usually self-limiting and rarely causes loss of vision.
 - Viral conjunctivitis usually resolves within 7 days. Epidemic keratoconjunctivitis (caused by adenoviruses) can lead to visual loss and light sensitivity.
 - Bacterial conjunctivitis typically resolves within 5 to 10 days. Contact lens wearers and immunocompromised people have the greatest risk of complications such as keratitis.

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TREATMENT

Advise the person that there is no recommended exclusion period from school, nursery or childminders for isolated cases but that many nursery and primary schools may nevertheless have an exclusion policy.

Give written patient information and explain [red flags](#) for urgent review.

Arrange follow up to confirm diagnosis and ensure that symptoms have resolved

If the person re-attends with ongoing symptoms of conjunctivitis, consider sending swabs for viral PCR (for adenovirus and *Herpes simplex*) and bacterial culture and empirical topical antibiotics (if not already prescribed)

Consider referral to ophthalmology if symptoms persist for more than 7 to 10 days after initiating treatment.

Arrange follow up to confirm diagnosis and ensure that symptoms have resolved

If the person re-attends with ongoing symptoms of conjunctivitis, consider sending swabs for viral PCR (for adenovirus and *Herpes simplex*) and bacterial culture and empirical topical antibiotics (if not already prescribed). Consider referral to ophthalmology if symptoms persist for more than 7 to 10 days after initiating treatment.

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Conjunctivitis associated with contact lens wear

If topical fluorescein does not identify any corneal staining and the person does not require [referral to ophthalmology](#):

Advise them to immediately stop contact lens use.

Advise regular bathing/cleaning of the eyelids with cotton wool soaked in sterile saline or boiled and cooled water to remove any discharge.

Advise that contact lenses should be kept out until all symptoms of the infection have gone.

Treat and arrange follow up as described above.

Have a low threshold for [referral to ophthalmology](#) if there is any suspicion of corneal involvement as this is a potentially sight-threatening condition.

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Allergic Conjunctivitis

Preparations that have dual antihistamine and mast cell stabilizing properties include:

- Azelastine — licenced for use in seasonal allergic conjunctivitis in adults and children over 4 years, apply twice daily, increased if necessary to 4 doses daily; licenced for use in perennial conjunctivitis in adults and children over 12 years, apply twice daily, increased if necessary to 4 doses daily; maximum duration of treatment 6 weeks.
- Epinastine — licenced for use in seasonal allergic conjunctivitis in adults and children over 12 years, apply twice daily; maximum duration of treatment 8 weeks.
- Ketotifen — licenced for use in seasonal allergic conjunctivitis in adults and children over 3 years, apply twice daily.
- Olopatadine — licenced for use in seasonal allergic conjunctivitis in adults and children over 3 years, apply twice daily; maximum duration of treatment 4 months.
- [\[BNF 73, 2017\]](#)



Neonatal Conjunctivitis



This is diagnosed in any infant who presents with conjunctivitis with discharge in the first 28 days of life.



It is important to differentiate this from discharge due to poor drainage of the lacrimal duct.



In this case, there is not conjunctival inflammation



Serious causes of neonatal conjunctivitis include gonorrhoea and chlamydia.



Corneal ulceration may occur in gonorrhoeal conjunctivitis. Neonatal chlamydial infection can be associated with a systemic infection, such as pneumonia.



Therefore infants should be referred to paediatrics for same day assessment of their conjunctivitis.



Red Eye



Subconjunctival haemorrhage. This is due to a bleed into the subconjunctival space. There may or may not be a history of a contributory factor, such as straining with coughing or constipation. It may be associated with hypertension. On examination, there is an area of localised, well-demarcated haemorrhage in one eye, in the absence of pain, no reduction of visual acuity, normal pupil reactions, and no corneal staining.



Subtarsal or conjunctival foreign body



Episcleritis. This presents with redness and pain in one or both eyes. On examination, there is segmental redness, with normal vision, pupil reactions, and no corneal staining.

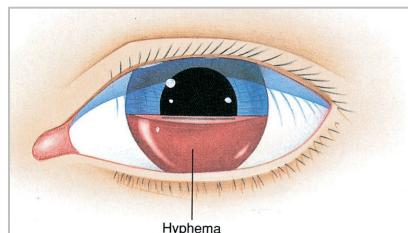
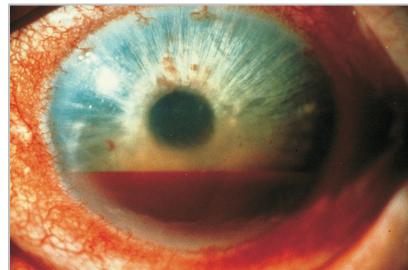


Child maltreatment. Although rare, suspect this if a child has retinal haemorrhages, or injury to the eye in the absence of major confirmed accidental trauma, or a known medical explanation, including birth-related causes



HypHEMA

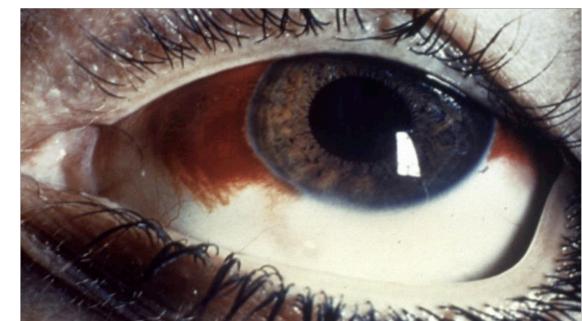
- Bleeding into the anterior chamber of the eye
 - Obscures vision
 - Blood clotting is a concern.
 - Can cause a rise in intraocular pressure



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SUBCONJUNCTIVAL HAEMORRHAGE



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Subconjunctival Haemorrhage

Ask/review use of any non-steroid anti-inflammatory drugs or anticoagulants
Check for any history of coughing, straining, trauma or vomiting
Check blood pressure
Observe lids and conjunctiva with white light

Treatment

Give patient subconjunctival haemorrhage information leaflet
If no history of trauma, no treatment is required; reassure patient that the haemorrhage will resolve over the course of a week or two
If trauma is the cause, consider referral to an ophthalmologist to ensure no underlying scleral damage or other injury
If subconjunctival haemorrhages are recurrent, further investigations may be required to exclude any clotting disorders; however in most cases no underlying serious cause will be found

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Keratitis

- Inflammation of cornea
- Infective or non-infective
- Contact lens use, surgery
- Painful
- Reduced visual acuity
- Discharge
- Photophobia common
- May lead to corneal ulcer – ophthalmologic emergency!!



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Inflammation

Anterior uveitis. This is inflammation of the anterior segment of the eye. It may be associated with other inflammatory disorders, such as ankylosing spondylitis, but the cause of the inflammation is usually not known. Clinical features include pain, which may be worse when the person is contracting the ciliary muscles, photophobia, watering of the eye, ciliary injection and constricted or distorted pupil. Vision may be normal or reduced.

Scleritis. This is inflammation of the sclera (the white outer wall of the eye), and is characterized by severe pain. It can be associated with connective tissue disorders such as rheumatoid arthritis and systemic lupus erythematosus. On examination, there may be reduced visual acuity and abnormal pupil reactions, depending on the site of the inflammation.

Scleritis can lead to perforation of the globe.



Uveitis

should be managed by an ophthalmologist; secondary care treatment will depend on the underlying cause of the uveitis.

Primary healthcare professionals may be asked to monitor:

- The person for adverse effects of long-term oral corticosteroids (continuous or repeated courses).
- The use of disease-modifying antirheumatic drugs (DMARDs) or immunosuppressants, depending on locally-agreed shared care guidelines
- That people receiving repeat prescriptions of topical corticosteroids are under the care of an ophthalmologist (to monitor for corticosteroid-induced glaucoma).

Do not initiate treatment for uveitis in primary care, unless asked to do so by an ophthalmologist.

Non infectious and Infectious Uveitis

Non-infectious uveitis

Corticosteroids are used to reduce inflammation and prevent adhesions in the eye. They may be given topically, orally, intravenously, intramuscularly, or by periocular or intraocular injection or implant. Corticosteroids are tapered slowly (over weeks) because withdrawing them too quickly may lead to rebound inflammation. A cycloplegic-mydiatic drug (for example cyclopentolate 1% or atropine 1%) may also be given to paralyse the ciliary body. This relieves pain and prevents adhesions between the iris and lens. People with severe or chronic uveitis may also be given systemic immunosuppressive drugs, tumour necrosis factor (TNF) inhibitors, laser phototherapy, cryotherapy, or have the vitreous removed surgically (vitrectomy).

Infectious uveitis

Infectious uveitis (bacterial, viral, fungal, or parasitic) is treated with an appropriate antimicrobial drug as well as corticosteroids and cycloplegics

Iritis

- Inflammation of the iris
 - Acute causes include:
 - Trauma
 - Irritants
 - Chronic causes include:
 - Autoimmune diseases
 - Arthritis
 - Irritable bowel disease
 - Crohn disease



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When should I refer red eyes?

- The referral triggers:
 - red eye accompanied by pain, photophobia or blurred vision
 - beware the unilateral red eye: should be viewed with greater suspicion than bilateral red eyes
 - if the red eye is a recurrence of a known recent condition
 - if the patient's symptoms worsen over next 24 hours
- If in doubt, always refer to optometrist or medical practitioner
- Always suggest the patient they should self-review make an immediate appointment with their optometrist or doctor if the condition worsens or fails to improve within the next 24 hours

COMMON EYE DISORDERS



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Common eye conditions - prevalence

80 per cent of vision impairment and blindness in the population over the age of 40 is caused by five conditions (listed alphabetically):

- Age-related Macular Degeneration (AMD) – 10 per cent
- Cataract - 15 per cent
- Diabetic retinopathy - 2 per cent
- Glaucoma - 5 per cent
- Under-corrected or uncorrected refractive error - 59 per cent

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What is age-related macular degeneration (AMD)?



- A chronic degenerative condition that affects the central vision.
- progression of the condition is likely
- ten per cent of people with macular degeneration have the “wet form” which may respond to treatment
- the majority of people have the “dry form”
- two out of three people will be affected by AMD in their lifetime.

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Prevalence and risk factors of AMD

- Ageing is the greatest risk factor with prevalence trebling with each decade over 40 years
- AMD is present in 13 per cent of people between the ages of 70-75 and is the leading cause of vision impairment in Australia
- Smoking increases the risk of developing AMD
- Family history is also a risk factor - genes have been identified and linked with AMD

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Age Related Macular Degeneration

Age-related Macular Degeneration (AMD)

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AGE RELATED MACULAR DEGENERATION

WET AMD – Abnormal blood vessels behind the retina start to grow under the macula, leading to blood and fluid leakage which causes scarring and rapid central vision loss. Straight lines appear wavy.

DRY AMD – The macula thins over time as part of the aging process with gradual blurring of vision. Gradual loss of central vision and presence of drusen which are tiny yellow or white deposits on the retina.

Functional implications of AMD

Difficulty distinguishing people's faces

Difficulty with close work

Perceiving straight lines as distorted or curved

Unable to differentiate between the footpath and road

Difficulty identifying the edge of steps if there is no colour contrast

Unable to determine traffic light changes

Difficulty reading, with blurred words and letters running together



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Treatment of AMD

Treatment options are improving with new technology

The wet form can be treated with intravitreal injections that aim to prevent further vision loss

Lost vision cannot be recovered - early detection to identify those who can receive treatment is the key



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U of Iowa, 2005

AGE RELATED MACULAR DEGENERATION



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Papilloedema

- Swelling or inflammation of the optic nerve
- Patients experience:
 - Headaches
 - Nausea
 - Temporary vision loss or narrowing vision fields
 - A “graying” in the field of vision

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- Can be caused by:
 - Abscess
 - Tumor
 - Inner ear infection
 - Lung infection
 - Dental infection

Papilloedema

Other causes:
Meningitis
Fever
Hypertensive crisis
Chronic high blood pressure
Guillain-Barré syndrome

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RETINAL DETACHMENT

Retina detaches from underlying structures

Detachment usually painless

Painless, flashing lights, floaters or a curtain drawn over a visual field

Risk Factors: Older patient after cataract surgery, near sightedness 25-50.

Treatment with surgery: Urgent

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Retinal Detachment

Ocular emergency

Hole, tear, or exudation into subretinal space

Usually occurs in older adults (40-70yrs)

Paintball injuries!

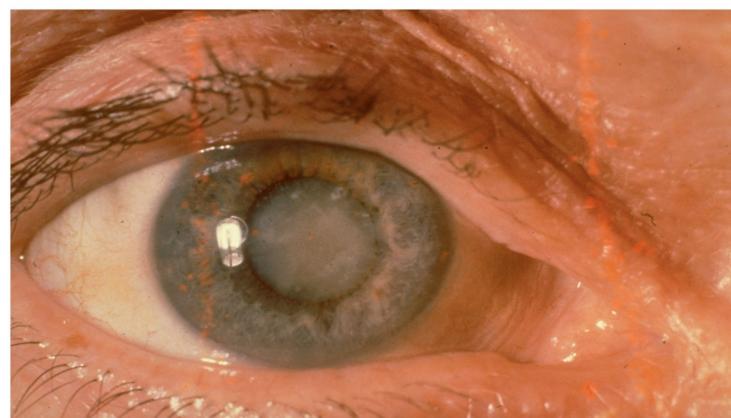
Flashing light, floaters, shadow, vision loss

Avoid pressure on globe, use eye shield

Transfer – may require emergency surgery

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CATARACTS

Painless cloudy lens that causes blurry vision.
Can be caused from age, diabetes, trauma, some medications and excessive UV light exposure

Treatment is curative with lens surgery



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What is a cataract?

- A cataract is the clouding of the lens inside the eye. With a cataract, light is scattered as it enters the eye, causing blurred vision



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Prevalence and risk factors of cataract

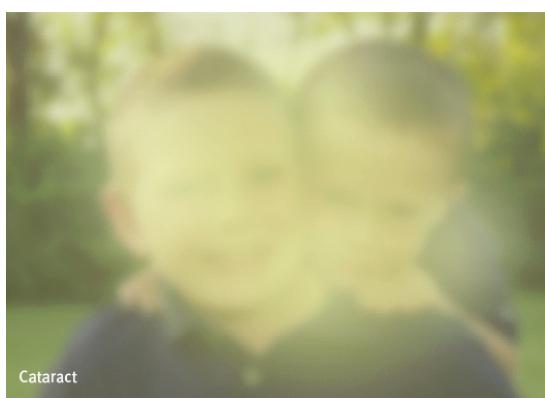
- 31 per cent of the population over the age of 55 has a cataract
- Long term use of corticosteroids can increase risk of cataracts
- Exposure to UV light can also increase the risk
- Ageing, smoking and having diabetes can increase the risk of developing cataract.



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Cataract



Cataract

- Blurred vision
- Reduced contrast
- Having difficulty judging depth
- Seeing a halo or double vision around lights at night
- Seeing images as if through a veil/smoke
- Being particularly sensitive to glare and light
- Having dulled colour vision.

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Treatment of cataract

Updating glasses can help with early cataract

Surgery: 180,000 cataract operations are done in
usually in and out of hospital on same day

no general anaesthetic is required (in most cases)

the cloudy lens inside the eye is removed, except for the back capsule
an intraocular lens implant (IOL), a new lens is inserted into the eye

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GLAUCOMA

Group of eye disease that develop due to elevated intra-ocular pressure (IOP)

Increased pressure affects the optic nerve and may cause vision loss

Open angle is painless

Angle closure occurs suddenly and is associated with pain and redness in the eye.

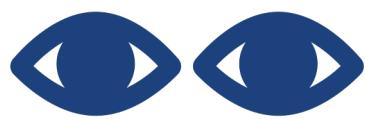
Treatment with eye drops, surgery or laser.

People with a family history of glaucoma, older patients and African Americans at higher risk



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What is glaucoma?

- It is a disease that affects the optic nerve at the back of the eye
- Relieving pressure on the nerve reduces progression of the disease
- Early detection and treatment can slow the vision loss

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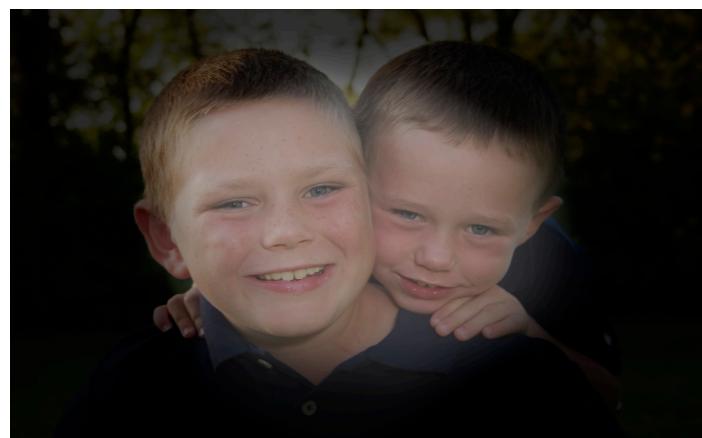
Prevalence of glaucoma

- People over the age of 40 are more likely to develop glaucoma than young people.
- Glaucoma has a genetic link and can occur in families. People with a first degree blood relative with glaucoma are eight times more likely to develop the disease than the general population and should regularly visit their eye health professional

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Glaucoma



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Functional implications of glaucoma

- No functional implications in early stages, silent disease
- Difficulty adjusting to lighting changes (e.g. between indoors and outdoors)
- Occasional blurred vision
- Seeing a halo around lights (angle closure)
- Increased sensitivity to glare and light
- Difficulty identifying the edge of steps or road
- Tripping over or bumping into objects

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Treatment of glaucoma

- Treatments are available but early detection is the key
- Lost vision can not be recovered. Treatment aims to prevent further vision loss
- Treatment may involve medication (eye drops), laser and/or other surgery as well as regular monitoring
- Early glaucoma is often asymptomatic. Regular eye tests are most important
- Long term compliance a major concern, 1/3 or more patients indicate poor adherence to drop therapy

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Glaucoma Treatment

Topical beta-blocker eye drops available for the treatment of glaucoma are:

Betaxolol 0.5% solution, 0.25% suspension, and 0.25% modified-release unit dose eye drop suspension (preservative-free). Usual dose is one drop twice daily.

Carteolol 1% and 2% drops. Usual dose is one drop twice daily.

Levobunolol 0.5% drops and 0.5% unit dose eye drops (preservative-free). Usual dose is one drop once or twice daily.

Timolol 0.25% and 0.5% drops and 0.25% and 0.5% unit dose eye drops (preservative-free). Usual dose is one drop twice daily.

Preservative-free preparations (without benzalkonium chloride) of betaxolol, levobunolol and timolol eye drops are available. These are more expensive than the standard preparations but may be prescribed by an ophthalmologist to a person with an allergy to benzalkonium chloride.

Combination preparations containing timolol include:

With prostaglandin analogues:

Bimatoprost — Ganfort®

Latanoprost — Xalacom®

Travoprost — DuoTrav®

With sympathomimetics:

Brimonidine — Combigan®

With carbonic anhydrase inhibitors:

Brinzolamide — Azarga®

Dorzolamide — Cosopt® (also available as preservative-free formulation)

Topical beta-blocker eye drops are not licensed for children under 18 years of age.

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Topical Prostaglandin Analogues

Topical prostaglandin analogues available for the treatment of glaucoma are:

Latanoprost 50 micrograms/mL drops.

Travoprost 40 micrograms/mL drops.

Tafluprost 15 micrograms/mL drops.

Bimatoprost is classed as a prostamide as it has a slightly different chemical structure to prostaglandin analogues, but is often included in their group. Topical preparations are 100 micrograms/mL and 300 micrograms/mL drops.

The dose for each preparation is usually one drop once daily, preferably in the evening.

Preservative-free preparations (without benzalkonium chloride) of latanoprost, travoprost, tafluprost and bimatoprost eye drops are available. These are more expensive than the standard eye drops but may be prescribed by an ophthalmologist to a person with an allergy to benzalkonium chloride.

Combination preparations containing timolol 0.5% are also available. These include:

Bimatoprost and timolol — Ganfort®.

Latanoprost and timolol — Xalacom®.

Travoprost and timolol — DuoTrav®.

Topical prostaglandin analogues and prostamides are not licensed for children under 18 years of age.

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What is diabetic retinopathy?

This condition is a complication of diabetes
It affects the small blood vessels of the retina
Blood vessels begin to leak and bleed inside the eye



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Prevalence and risk factors of diabetic retinopathy

- It is estimated that three per cent of the population aged over 55 years have diabetic retinopathy
- 22 per cent of people with known Type 2 diabetes have some form of retinopathy related to their diabetes
- Within 15 years of being diagnosed with diabetes, three out of four diabetics will have diabetic retinopathy
- People who have had diabetes for many years, have diabetic kidney disease or have Type 1 diabetes have a greater risk of developing diabetic retinopathy
- Diabetic retinopathy is the primary vision threatening condition for Aboriginal and Torres Strait Islander people

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Diabetic Eye Disease

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Diabetic retinopathy

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Functional implications of diabetic retinopathy

- Difficulty with fine details (e.g. when reading or watching television)
- Fluctuations in vision from hour to hour or day to day
- Blurred, hazy or double vision
- Difficulty seeing at night or in low light
- Being particularly sensitive to glare and light
- Having difficulty focusing

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Treatment and prevention of diabetic retinopathy

- Early detection and timely treatment is essential
- 98 per cent of severe vision loss can be prevented with early detection and timely laser treatment
- Good control of:
 - blood sugar levels
 - blood pressure
 - cholesterolcan help reduce the severity of eye disease

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Prevalence and risk factors of refractive error

- All age groups can be affected by refractive error
- People over the age of 40 should have regular eye tests to eliminate refractive error as a cause of any vision impairment
- Family history of refractive error is a risk factor

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Refractive error

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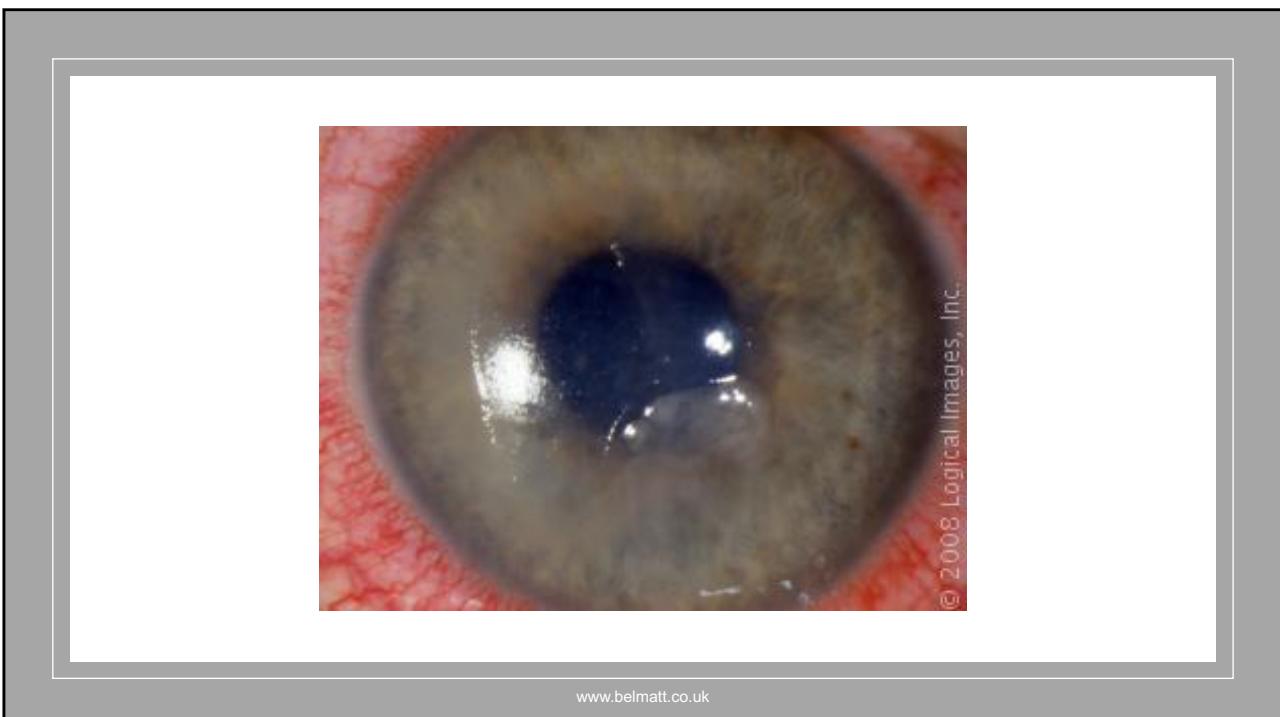
Emergency advice for chemical burns or splashes

- Irrigate affected eye(s) with water for at least 15 minutes, then attend emergency department of hospital
- Don't apply drops, ointments, or other treatment
- Patient to remove contact lenses where possible



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Fluorescein

The image shows two types of fluorescein product packaging. On the left, there are two boxes of 'Minims' fluorescein sodium eye drops, each containing 30 single-use dispensable units. On the right, there is a box of 'Fluorets' fluorescein sodium sterile ophthalmic strips, which contain 25 single-use dispensable strips. Both products are manufactured by Belmatt.

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SCIENCEphotOLIBRARY



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Corneal Abrasion

Observe conjunctiva and cornea with white light

Instil 1 drop of fluorescein 0.25%.

Observe for corneal staining preferably using a blue light Evert upper eye

Moisten a cotton bud with a few drops of sodium chloride 0.9%

Gently remove the foreign body with the cotton bud, sweeping it away from the corneal surface

Re-examine the eye to ensure the foreign body has been fully removed

Treatment

Give chloramphenicol ointment four times daily for five days

Consider padding and oral analgesia as for corneal abrasion

Offer advice, eg on the wearing of safety glasses, to prevent another injury



© 2011 Elsevier Ltd. Kanski: Clinical Ophthalmology: A Systematic Approach 7e.



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- Periorbital cellulitis
 - Presents as a painful, red, swollen eyelid
 - Risk factors:
 - Insect bites
 - Upper respiratory disorders
 - Trauma

Cellulitis of the Orbit

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Cellulitis of the Orbit

- Assessment and management
 - Treatment includes antibiotics.
 - Prehospital management includes:
 - Ruling out life threats
 - Obtaining a thorough history
 - Transporting to the appropriate care

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Systemic Disease & the Eye

- Herpes zoster / shingles = dendritic ulcer
- TB= uveitis
- Sarcoidosis = bilateral uveitis
- Syphilis= keratitis / uveitis and chorioretinitis
- Toxoplasmosis = choroiditis / chorioretinitis
- Toxocara = chronic endophthalmitis
- Rheumatoid arthritis = episcleritis / scleritis, uveitis, dry eyes
- Stills disease = juvenile arthritis – uveitis
- Ankylosing spondilitis - uveitis
- Ulcerative colitis and Crohns disease - uveitis

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- Reduced visual acuity.
- Deep pain within the eye.
- Unilateral red eye.
- Contact lens use.
- Photophobia. This can be a symptom of acute uveitis, corneal ulcer, contact lens-related red eye or corneal foreign body. Systemic causes of photophobia, such as meningitis should also be considered. All high-velocity injuries (for example injuries occurring while hammering or chiseling), or injuries involving glass.
- Chemical eye injury.
- Ciliary injection. This pattern of redness may be seen in corneal ulcer, contact lens related red eye, corneal foreign body and anterior uveitis.
- Fluorescein staining. This can indicate corneal ulcer or abrasion.

Indications of a serious, and potentially sight-threatening, cause of the person's red eye include:

Refer

- Unequal or misshapen pupils, or abnormal pupillary reactions. Abnormal pupil reactions are seen in acute glaucoma and anterior uveitis.
- Pain on pupillary constriction. This can be elicited on testing the direct light reaction, consensual light reaction or finger-to-nose convergence test.
- Conjunctivitis in an infant in the first 28 days of life.



Refer



- Herpes infection
 - Systemic *Herpes simplex* infection is a life-threatening condition.
 - Ocular infection with *Herpes simplex* or *Herpes zoster* requires urgent specialist assessment and treatment with oral antivirals[[American Academy of Ophthalmology, 2013; Azari, 2013b; Alfonso, 2015](#)].
- Conjunctivitis associated with contact lens use
 - If topical fluorescein reveals corneal staining (epithelial defect) — urgent referral is required as this can be a sight-threatening condition [RCGP,2013; Drew,2015](#).
 - Bacterial keratitis can occur in contact lens wearers [[Azari, 2013b](#)].

Refer urgently to ophthalmology

- The Royal College of General Practitioners recommends having a low threshold for urgent referral to ophthalmology in people presenting with red flags for a serious cause of red eye [RCGP,2013](#).
- Ophthalmia neonatorum
- All cases of neonatal sticky eye with redness must be urgently referred to ophthalmology to prevent serious systemic and local complications

Systemic Drugs &the Eye

- Steroids - cataract, glaucoma
- Amiodarone - optic neuropathy/neuritis
- Chlorpromazine - discolouration of conjunctiva, sclera – possible slate blue
- Tetracyclines – conjunctival deposits
• (dark brown / black granules)
- Beta-blockers – reduce tear production



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Finally

- Take a good history
- Look out for red flags
- Refer if unsure
- Ensure follow up
- Health education
- Stay updated with current practice
- Practice , practice, practice!!!



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