The Eye Book

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Introduction

Purpose

Communication and education are important parts of healthcare delivery and are essential for patients to make appropriate health decisions regarding choice of therapies and adherence to medical advice.

This book is intended for use by physicians, nurses and healthcare professionals who work in the area of ophthalmology, as a tool to facilitate their discussions with patients, parents, family members, or caregivers.

This book is not a substitute for talking with the patient or family. This book is not meant to be given to the patient or family to be read on their own. It is designed to be used by healthcare professionals as an aid and focus for discussions.

There is no script, no description or discussion that is correct for all patients. Communication must be patient centric – specific to each patient, their clinical situation, personal situation, emotional state, language and educational abilities.
Suggestions for effective patient / family communication

- Prepare before you begin by reviewing all charts and other available documentation.
- Start all discussions by asking the patient/family member to tell you about the medical problem, even if you already have that information. Listen – determine the patient’s/family’s language skills, and their basic understanding of the problem. Pay attention to their emotional state. Ask questions about where they live, how they get to and from the clinic, who is available to accompany or help the patient, if necessary. Use this information to adjust your explanations to an appropriate level.
- Encourage the patient/family to ask questions.
- Think of communication as a slow drip, not a quick push. Do not try to give all information in one piece.
- Avoid using medical terms that non-professionals may not understand.
- Respect each patient’s/family’s beliefs. If a mother says, “I am afraid for my child.” Do not respond, “There is nothing to worry about.” Instead, respect her concern – “Of course you worry about your child. That is why we will ...........” Or, perhaps a patient says “I want to see my traditional healer”, or “Prayer will help me get better.” Do not respond that traditional healers or prayer are nonsense. Respect their beliefs.
- Ask questions as you deliver each piece of information, to be sure that the patient/family has understood. Use a technique called “teach back”. Ask the patient/family – “Tell me, what is the problem and what are you (or we) going to do?”
- Think about your body language – how you sit or stand, how you speak.
The Eye Book is organized as follows

Normal Eye

A series of full-colour illustrations of the external and internal anatomy of the eye, eye muscles, and normal refraction.

External Diseases
- Conjunctivitis
- Ptosis
- Chalazion
- Pterygium
- Corneal Ulcer

Internal Diseases
- Cataract
- Glaucoma
- Diabetic Retinopathy

Refractive Errors
- Myopia
- Hyperopia
- Astigmatism
- Spectacles – how they work

Paediatric – (where information differs from adult)
- Conjunctivitis
- Ptosis
- Cataract
- Glaucoma
- Squint
- Retinoblastoma
- Children and Spectacles
Normal Eye
External Anatomy of the Eye

- Upper eyelid
- Pupil
- Iris
- Sclera
- Lower eyelid
Eye Muscles
Internal Anatomy of the Eye

- Retina
- Lens
- Iris
- Pupil
- Cornea
- Aqueous
- Conjunctiva
- Sclera
- Macula
- Optic nerve
- Vitreous humor
Normal vision
External Diseases
Conjunctivitis

The problem
- Conjunctivitis, also called pink eye, is an inflammation of the conjunctiva, the thin clear tissue that covers the white part of the eye and lines the inside of the eyelid.
- Symptoms can include itchiness and watering of the eye, and sometimes a sticky yellow crust.
- Conjunctivitis can affect one or both eyes.
- It is caused by an infection, allergy, injury or irritation from dust or chemicals.

Why treat conjunctivitis?
- If the conjunctivitis is caused by an infection, the infection can spread.
- If the conjunctivitis is caused by a chemical irritant, if not urgently referred and treated it can lead to permanent damage of the eye.

Treatment
- Many cases of conjunctivitis will go away in a few days, with no treatment.
- The most common treatment is eye drops or ointment, to either treat the infection or reduce inflammation.
- If the conjunctivitis is caused by an allergy, anti-allergic medications may be given.
- It is very important to wash hands, often, throughout the day.
- If you use a towel to dry the eyes, do not share the towel with others, as it will spread the infection.
- If the symptoms do not go away within a few weeks, return to the clinic.
Ptosis

The problem

- Ptosis is a drooping of the upper eyelid caused by a weakness in the muscle that raises the eyelid.
- Most often it occurs in one eye, but it can also occur in both eyes.
- Most often caused by normal aging.
- Can occur in newborns or young children.
- Can be caused by injury to the eye or nerves in the face.
- Can be caused by certain illnesses, like diabetes or stroke.

Why treat Ptosis?

- If the eyelid covers all or part of the pupil, it blocks vision. Should be repaired soon.
- Cosmetic – appearance. No medical danger. Treatment can wait.

Treatment

- There are no medications or traditional treatments to correct ptosis.
- The only treatment is surgery to lift the eyelid.
Ptosis
Chalazion

The problem
• A chalazion is a small bump in the eyelid, caused by a blocked oil gland. It is usually painless.
• Very often, a chalazion will go away on its own in about one month.

Why treat a chalazion?
• If the chalazion does not go away, it can be treated to decrease pain and discomfort.

Treatment
• Do not squeeze it or try to open it!
• Apply warm compress on the eye for 10-15 minutes, 3 to 6 times a day.
• Eye drops or ointment - only if there is an associated infection of the eyelids.
• Surgery to remove it – only in the worst cases, which don’t respond to other treatments.
Chalazion
Pterygium

The problem
• Pterygium is a non-cancerous growth in one or both eyes, caused by exposure to sunlight or irritants, such as dust and wind.

Why treat pterygium?
• Most pterygia are harmless, especially the tiny ones and do not require any treatment
• In some cases, it can cause redness or irritation of the eye.
• If the growth covers a large part of the cornea, it can cause vision problems.
• If the growth covers the pupil, it can block vision.

Treatment
• If the growth is small and not causing other problems, no treatment is necessary.
• There is no medication or traditional medicine that will make a pterygium go away.
• If there is redness or irritation, eye drops can be used.
• If the growth covers a large part of the cornea or the pupil, it must be removed surgically.
• The growth can come back. It is important to come to the clinic if there is any regrowth.
The problem

- A corneal ulcer is an open sore in the outer layer of the cornea, the clear window in front of the eye.
- Corneal ulcers may be caused by infection, such as herpes virus, gonorrhea, or by trauma.

Why treat a corneal ulcer?

- A corneal ulcer can lead to scaring and loss of vision, or loss of the eye.

Treatment

- All ulcers must be referred to a specialist eye care worker, for treatment, as soon as possible.
- Eye drops.
- Very severe ulcers may need surgery.
Corneal Ulcer
Internal Diseases
Cataract

The problem
- The lens of the eye is normally clear, allowing light to pass into the eye.
- A cataract is clouding of the lens – turning the lens from clear to milky white. This blocks the light from passing into the eye.
- Cataracts start small and get larger with time – eventually causing blindness.
- Cataracts can occur in one eye or both eyes.
- Cataracts usually occur in older people, but they can appear at any age, including infants.
- Cataracts can also be caused by injury to the eye.

Why Treat Cataract?
- Over time, the cataract blocks more and more light entering the eye, causing vision loss and eventually blindness.

Treatment
- There are no medications or traditional treatments that will make a cataract go away.
- The only way to treat a cataract is an operation to remove the cataract and replace the natural lens with an artificial lens.
Cataract
Cataract

Normal

Focal point

Light

Cataract

Cataract

Light
Cataract Surgery

The patient is awake.
- The eye is not removed.
- The operation takes 20 minutes.
- After the operation, there is a patch covering the eye.
- The patient stays at least one night in hospital – sometimes several days, depending on their general health and how far they live from the clinic.
- The patch is removed the next day and the patient can immediately see.
- If the patient has cataracts in both eyes, one will be operated and the second a few weeks or months later.
- Some people may need spectacles after the operation.
Before operation

After operation
Glaucoma

The problem

- The eye is filled with a clear liquid.
- This liquid is continuously being made and then drained away, always keeping the same amount of liquid in the eye.
- If the opening that lets the liquid out of the eye is closed, more and more liquid will remain in the eye, increasing the pressure in the eye.
- Increased pressure can damage the eye and cause reduced vision and then blindness.
- This condition is called glaucoma.

Why treat glaucoma?

- If glaucoma is not treated, it may cause loss of side vision or blindness.
- Unlike cataract, damage to the eye and loss of vision are irreversible.

Treatments

- There are no traditional treatments that can cure glaucoma.
- There are eye drops to reduce the pressure in the eye. These drops must be used on a regular basis.
- The pressure inside the eye and side vision must be checked regularly.
- If damage to the eye and side vision loss continues, despite medical treatment, laser treatment or surgery (the most effective of all three) is necessary to prevent blindness.
Glaucoma

1. Blocked drainage canal
2. Fluid building up
3. Increased pressure inside eye
4. Swelling and clouding of cornea
Glaucoma - effect on visual field

Normal vision

Early glaucoma

Advanced glaucoma

Extreme glaucoma
Diabetic Retinopathy

The problem
- The retina, at the back of the eye, has many small blood vessels.
- When blood sugar is too high (diabetes), these small blood vessels can break and leak blood or fluid into the eye and damage the retina. It can also cause the blood vessels to grow and block light from reaching the retina.
- At early stages, there are no symptoms.
- At later stages, there are floating spots and blurred vision.
- Diabetic retinopathy is very common in patients with all types of diabetes.

Why treat diabetic Retinopathy?
- If not treated, diabetic retinopathy can lead to severe vision loss or blindness.

Treatments
- It is essential that treatment begin as quickly as possible to prevent damage to the eye.
- Injection of medicine into the eye to stop the growth of new blood vessels and leaking of fluid.
- Laser treatment, to slow the leakage of fluid.
- Not all eye clinics are prepared to treat this problem and the patient may be referred to another clinic.
- There are no traditional treatments for this condition.
Diabetic Retinopathy

Normal retina

Diabetic retinopathy
Diabetic Retinopathy

Normal vision

Diabetic retinopathy
Refractive Errors
Refractive Errors

A normal eye is shaped like a round ball. When light enters the front of the eye and passes through the lens, it will focus perfectly on the retina, at the back of the eye.

**Myopia – Nearsightedness**
If the eye is longer than normal, the lens will focus the light in front of the retina. This is called myopia or nearsightedness, because you can see things that are near, but things that are far away are blurred.

**Hyperopia – Farsightedness**
If the eye is too short, the lens will focus the light behind the retina. This is called hyperopia or farsightedness, because you can see things that are far away, but things that are near are blurred.

**Astigmatism**
Before light can reach the lens, it must pass through the outer layer of the eye, the cornea. The cornea should be round in shape. If the cornea is not round, but irregular in shape, it will bend the light and cause all images to be blurred.

**Why treat refractive errors?**
Treating refractive errors will improve the patient’s ability to see clearly, to read, work, drive, play sports and enjoy life fully.

**Treatment**
Spectacles – correct the shape of the eye or cornea. Wearing spectacles will not make the eyes worse.
Normal vision
Myopia

Myopic eye
Too long

Focused light misses the focal point and is perceived as blurred.
Hyperopia

Hyperopia eye is shorter in length

Focused light misses the focal point and is focused behind retina.
Astigmatism

Cornea is misshapen

Several focal points
How spectacles work

Myopia (corrected)

Minus lens

Hyperopia (corrected)

Plus lens
Paediatric
Conjunctivitis

The problem

- Conjunctivitis, also called pink eye, is an inflammation of the conjunctiva, the thin clear tissue that covers the white part of the eye and lines the inside of the eyelid.
- **Conjunctivitis of the newborn** is often transmitted at birth by a mother infected with gonorrhea. This is a serious and potentially blinding disease, within days or weeks.
- **Allergic conjunctivitis** can be very persistent and severe and lead mothers to use harmful traditional medicines or unexperienced medical personnel to overuse steroid eye drops, which year later can cause cataract or glaucoma.
- **Conjunctivitis** can also be associated with trachoma, in areas where this disease is found.
- Symptoms can include itchiness and watering of the eye, and sometimes a sticky yellow crust.
- Conjunctivitis can affect one or both eyes.
- It is caused by an infection, allergy, injury or irritation from dust or chemicals.

Why treat conjunctivitis?

- If the conjunctivitis is caused by an infection, the infection can spread.
- If the conjunctivitis is caused by a chemical irritant, if not urgently referred and treated, it can lead to permanent damage of the eye.

Treatments

- Many cases of conjunctivitis will go away in a few days, with no treatment.
- The most common treatment is eye drops or ointment, to either treat the infection or reduce inflammation.
- If the conjunctivitis is caused by an allergy, anti-allergic medications may be given.
- It is very important that the child wash hands, often, throughout the day.
- If the child uses a towel to dry the eyes, they should not share the towel with others, as it will spread the infection.
- Try to discourage the child from rubbing the eye.
- Children with conjunctivitis should not go to school or day care until their eyes are better.
- If the symptoms do not go away within a few weeks, return to the clinic.
Conjunctivitis
Ptosis

The problem
- Ptosis is a drooping of the upper eyelid caused by a weakness in the muscle that raises the eyelid.
- Most often it occurs in one eye, but it can also occur in both eyes.
- Can occur in newborns or young children.

Why treat Ptosis?
- If the eyelid covers all or part of the pupil, it blocks all or part of vision.
- If vision is blocked, the eye will not develop normally, resulting in poor vision. This must be corrected immediately!
- Cosmetic – appearance, especially for children. If the eyelid is not covering the pupil, correction can wait.

Treatment
- There are no medications or traditional treatments to correct ptosis.
- The only treatment is surgery to lift the eyelid.
Ptosis

Drooping Eye (ptosis)
Cataract

The problem
- The lens of the eye is normally clear, allowing light to pass into the eye.
- A cataract is clouding of the lens – turning the lens from clear to milky white. This blocks the light from passing into the eye.
- Cataracts start small and get larger with time – eventually causing blindness.
- Cataracts can occur in one eye or both eyes.
- Infants can be born with cataracts.
- Children can get cataracts from an injury to the eye.

Why treat Cataract?
- Children must have a clear lens to allow light into the eye. If the lens is not clear, the child’s vision will not develop and the child may have poor vision or become blind.
- To prevent permanent poor vision or even blindness, children who are born with cataract must be treated within the first 6 months.

Treatment
- There are no medications or traditional treatments that will make a cataract go away.
- The only way to treat a cataract is an operation to remove the cataract and replace the lens with an artificial lens.
- In infants and children, it is important to have treatment as quickly as possible.
- Children will require spectacles after the operation.

Important Note: Not all white pupils in children are cataract. A white pupil can also be an indication of a cancerous tumor in the eye (retinoblastoma) and must be treated immediately. A white pupil in a child should always be treated as an emergency!
Cataract

White pupil (cataract)
Cataract Surgery

- The child is asleep.
- The eye is not removed.
- The operation takes 20 minutes.
- After the operation, there is a patch covering the eye.
- The child stays one night in hospital, or maybe longer – until the doctor is certain that the child has fully recovered from the general anesthesia and is able to travel home.
- The patch is removed the next day.
- If the child has cataracts in both eyes, one will be operated and the second a few weeks or months later. In some cases, both eyes are operated at the same time.
- The child will need spectacles after the operation.
Cataract

Before operations

After operations
Glaucoma

The problem
- The eye is filled with a clear liquid.
- This liquid is continuously being made and then drained away, always keeping the same amount of liquid in the eye.
- If the opening that allows the liquid to drain is closed, more and more liquid will remain in the eye, increasing the pressure in the eye.
- Increased pressure can damage the eye and cause reduced vision and then blindness.
- This condition is called glaucoma.

Why treat Glaucoma?
- If glaucoma is not treated, it may cause decreased vision and blindness.
- For children, if treatment is delayed, the child may always have poor vision.
- If a child is born with glaucoma, it is important to treat before the eyes get large (“bulls eye”) as shown on the following page.

Treatment
- There are no traditional treatments that can cure glaucoma.
- There are medications to reduce the pressure, but these medications are very expensive and must be taken on a regular basis.
- In young children, an operation is frequently done to make small openings in the eye, allowing the extra fluid to drain.
The eyes look big, with the corneas blurry and gray.
Normal

Site of production

Drainage canal
Glaucoma
Squint

The problem
• Movement of the eyes is controlled by 6 muscles attached to each eye.
• These muscles allow the eyes to move in all directions.
• Both eyes should always move together so that even though we have two eyes, we see one thing at a time.
• If one of the muscles is weak, the eye cannot move properly and the two eyes cannot move together.
• This is called squint or strabismus.
• Squint can occur in one eye or both eyes.
• Squint occurs in children, usually before the age of 3 years.
• Squint can be present all of the time, or just sometimes, especially when the child is tired.
• Squint can also be a symptom of other eye problems and should always be examined by an eye professional.

Why treat Squint?
• If squint is not treated, the weaker eye will not develop good vision and become a “lazy eye”.
• Children with squint often develop poor self-image and may have emotional problems.

Treatment
• There are no medications or traditional treatments that will help squint.
• In very mild cases of squint, patching of the good eye may help to strengthen the muscles in the weak eye.
• Surgery to correct the eye muscles.
Squint
Eye Muscles
Squint

Before operation

One day after operation
Retinoblastoma

The Problem

• Retinoblastoma is a cancerous growth inside the eye.
• Retinoblastoma occurs in young children.
• Retinoblastoma occurs in one or both eyes.

Why Treat Retinoblastoma?

• Retinoblastoma is a cancer. If it is not treated, it will grow and spread and can lead to death.
• If retinoblastoma is treated early, it may be possible to save the child’s eye.
• If retinoblastoma is not treated early, it will be necessary to remove the eye in an effort to save the life of the child.
• It is essential to treat retinoblastoma as quickly as possible because it is a life-threatening disease.

Treatment

• There is no medication or traditional treatment that will cure retinoblastoma.
• The only treatment for retinoblastoma is an operation, either to treat the growth directly and save the eye, or to remove the entire eye to save the child’s life.
• Sometimes, it is possible to destroy growths with special instruments that freeze the growth (cryotherapy) or heat the growth (thermotherapy).
• Radiation or chemo therapy may be used to shrink the growth, or may be necessary after an operation, to prevent further growths from forming in the eye or elsewhere in the body.
• A child who is treated for retinoblastoma must have follow-up tests and periodic checkups.
Retinoblastoma

Cancer of the eye
Retinoblastoma
Retinoblastoma

Early

Late

Too late
Children and Spectacles

There are many reasons that a child may require spectacles.

**Refractive Errors**
- A child who cannot see properly, cannot learn and cannot play.
- Whenever wearing spectacles will help a child to see, they should be prescribed and worn.
- Wearing spectacles will not make a child’s eyes worse.
- Children with farsightedness may outgrow this problem as they get older.
- Children with nearsightedness will most likely continue to need spectacles.

**Squint**
- The wearing of spectacles may be part of the treatment of squint and a lazy eye.

**Glaucoma**
- Children with glaucoma may require spectacles to improve their vision.

**Cataract**
- After cataract surgery, even though a lens was implanted, the child may require spectacles to improve vision.

*If your child is prescribed spectacles, it is very important that the child wears the glasses all the time, especially at school.*
Children and Spectacles