

Glaucoma in Children



Glaucoma is Greek in origin and describes a “blue-grey” or a “blue-green” colour. How does a word describing colours come to be used in naming of an eye condition?

Well, one of the prominent features of glaucoma is a **build up of pressure in the eye**. As the pressure increases, the clear window at the front of the eye, the cornea, starts to **have trouble in keeping itself transparent**.

The inner surface of the cornea then **“fractures”** and **fluid** starts to **accumulate** in its substance. So that **when light reflects** off this damaged surface, the onlooker starts to **see a bluish-green or bluish-grey** colour instead of being able to look straight into the eye.



What causes this pressure in the first place?

A clear fluid called **aqueous humour** provides oxygen and nutrients to the tissues of the anterior portion of the eye and is produced by a delicate fabric of cells called the **ciliary epithelium** near the front of the eye. The fluid **exits the eye via the trabecular meshwork** which **drains into a series of channels**.

It is like the flow of water into and out of a bathtub

A **metaphor** for the flow of **aqueous(fluid)** through the inside of the eyeball can be described by the flow of water into and out of a **bathtub**. The following parts of the eye can be best personified by the following parts of a bathtub:

Ciliary epithelium = **the Taps**
Front of the eye = **the Bathtub**
Trabecular meshwork = **the Plug Hole**



When you decide to fill a bathtub full of water for bath-time, you put in the plug and turn on the taps. Then you wait for the water to rise to the preferred level. Once there, you turn off the taps, right?

But... What if something distracts you and you forget to turn off the taps? Or maybe your child may have turned on the taps to their maximum and went out to play with the dogs or in the garden.

This is the best way to describe what happens in the case of glaucoma. In glaucoma, either someone turns the taps on **“full blast”** and the plughole can't drain enough water away **fast enough**, or the taps are on, but someone puts the plug in and forgets to turn off the **water in time**.

Both scenarios result in the bathroom being **flooded**.

In the eyeball, either **the ciliary epithelium** starts to make **too much aqueous fluid** or the **trabecular meshwork** becomes **blocked**. This translates into the **pressure** in the eyeball **increasing to dangerous levels**.

VERY IMPORTANT!!!!

Children may present with no symptoms at all! This is why routine eye examinations by a specialist is so important.

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Glaucoma in Children



Who is the culprit (who left the taps open)?

Diseases that may block or “plug” the trabecular meshwork include **genetic malformations** of the meshwork itself and **inflammation**

What effect does this increase in pressure have on the eye?

The **optic nerve** is situated at the **back of the eye**. This nerve is the **highway that transmits** all the information from the outside world to the brain **for interpretation**. In order to **function optimally** the nerve has tiny **blood vessels** that bring it **nourishment** as well as having its **own internal circulation (flow)**. If the pressure in the eyeball **increases above the level** at which the eye can function normally, it starts to **squash the blood vessels** “feeding” the optic nerve as well as the flow within the nerve. If **left unchecked**, the **nerve starts to die** and thus **vision starts to deteriorate**. This vision loss will progress and **become permanent** if **not treated**.



Is Glaucoma common in children?

Fortunately, **glaucoma in children is rare** with an incidence of 2.29 per 100,000 and can develop in only one or both eyes. The child can be born with the **condition (congenital)** or develop it **later in childhood (juvenile)**.

Due to the **serious prognosis** of the disease if left untreated, it is helpful to have an idea what signs a child might present with so that they can be accessed by an expert promptly.

What to look out for

Babies born with **congenital glaucoma** can present with the following:

- unusually large eyes
- excessive tearing
- cloudy eyes (some parents notice a blue hue to the clear part of the eye)
- light sensitivity
- poor vision and jerky eye movements (nystagmus)

Older children who have **juvenile glaucoma** often **don't present** with any **noticeable symptoms**, which is one of the reasons why routine childhood **screening** by a specialist is **essential**.



VERY IMPORTANT!!!!

If glaucoma is left untreated, permanent vision loss occurs.

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Once glaucoma has been diagnosed, is there any treatment available to preserve the child's vision?

The treatment for glaucoma in **children is surgery**. Medications are **sometimes** used to augment surgery, but they are not recommended to be used as a "first line" treatment long term.

This is different to the manner in which glaucoma is usually treated **in adults**. With adults, medication is the primary mode of treatment.

There are a number of different types of **glaucoma drainage procedures available**. All of the techniques try to enhance the drainage of fluid from the eye.



Prognosis

It is extremely difficult to give a definite prediction of how good a child's eyesight will be after treatment, especially when the child is very young.

Many children with glaucoma who have been treated do have excellent vision into adult life and many of them have effectively normal vision, but there are also those that have very poor vision and even permanent blindness.

However, the most important thing is **control of the intraocular pressure** and then further treatment if necessary, with **glasses and patches** to ensure that the vision **develops normally**.

As the child grows older the specialist will have a better idea of how good their long-term vision will be. Following successful treatment, the child will need to **return to the clinic at regular intervals for check ups**.

Glaucoma in children is a condition that needs to be monitored for life!

Did you know?

Did you know that the normal pressure in the eye is 12 - 20 mmHg? This means that even a small change to the pressure can have an effect. To give you a comparison, the pressure in a new tennis ball is roughly 1520 mmHg.



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