Wrightington, Wigan and Leigh Teaching Hospitals
NHS Foundation Trust

# Visual Development in Children

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# Visual Development in Children

## Parent & Carer Information

## Orthoptic Services

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## Introduction

This leaflet aims to give you an understanding of how vision develops in children and how wearing glasses can help this.

## The visual system

Vision comes from within the brain. The eye acts as a camera to transmit the information. People can have difficulty seeing because either there is a problem with how the eye or the brain processes the images or both.

## Visual development

The majority of visual development happens within the brain in the first 7 to 8 years of life. To allow vision to develop normally images must be seen clearly and in focus at the back of the eye (the retina). This then transmits a clear and focussed image to the brain where the visual cells are stimulated and develop.

If there is an uncorrected need for glasses the image on the retina is out of focus, therefore the image going to the brain is out of focus and the visual cells do not develop to their full potential.  If there is a squint (a turn in the eye), the brain ignores this eye and the visual cells do not develop.

## When there is a need for glasses

In a normally focussing eye the light rays enter the eye and bend. As the light rays meet and focus they focus on the retina.

## Longsight (Hypermetropia/Hyperopia)

A child who is longsighted will have affected near vision and often distance vision as well. The image seen on the retina is a blurred image because the focal length of the eye is

too short and the light rays have not been fully focussed. The lens used to correct this allows the light to be bent to focus the image onto the retina. The higher the number of lens the more the light needs bending. This does not mean the eyes are worse or bad it just means the focal length is shorter.

## Shortsight (Myopia)

A child who is short-sighted will mainly have affected distance vision. Their near vision may not be significantly affected. The image seen on the retina is a blurred image because the focal length of the eye is too long. The light rays will have focussed in front of the retina. The lens used to correct this bends the light outwards more so that it can focus on the retina. The higher the lens number is, the longer the focal length of the eye is. This does not mean the eyes are bad or worse it is just a measure of how much the light needs bending.

## Astigmatism

This is where the focal length of the eye is not the same in all directions. Light may need focussing by one power in one direction and a different power in the opposite direction. Some people refer to this as a rugby ball shaped eye. This is not anything to be concerned about; it is just a different type of focussing error.

As a child grows, so do their eyes. Depending how their eyes grow depends on what number lens is needed. Some children need a lesser strength of lens as they get older, some need a stronger lens. This just indicates the focal length of the eye. The most important thing is that the image is focussed on the retina as this gives a clear image to the brain.

**These are some frequently asked question by parents:**

## When should my child wear their glasses?

When a child is prescribed glasses, Orthoptists recommend full time wear regardless of the strength of the lens. This is because it is important for the brain to have constant stimulation of a clear image to allow the visual cells to develop. If the glasses are not worn full time there is a chance the vision will not develop fully. In some cases the brain also gets confused and tries to make the eyes over focus which can then cause blurred vision with the

glasses on. This may also cause eye strain, headaches and in some cases cause an eye to turn inwards.

## If they always wear the glasses are they not going to just get stronger and stronger?

Parents are often concerned that wearing glasses all the time means the lens will get stronger and stronger. This is not the case. The lens value may increase or decrease depending on the growth of the eye. If a lens gets stronger it is down to the growth of the eye and not because glasses have been worn.

## How do you know the lens is the right strength?

When your child has a glasses test at the eye department, we use drops to stop him/her over focussing. The optician shines a special light into the eye and uses lenses to measure the focal length. Depending on this focal length depends on the lens needed. Some parents are concerned that the test in inaccurate if the child has not performed very well with the pictures or letter tests. By doing the test with the drops, we do not need to rely on the child's responses for an accurate result. We use the pictures and letter tests to help us monitor any change in vision.

## When will my child have their glasses changed?

In the majority of cases we will check the focal measurement of the eye once a year and change the glasses accordingly. Your child will be reviewed regularly through the year by an Orthoptist; if we feel this test needs to be done sooner we can arrange this.

## Will my child always need glasses?

This is not always possible to say straight away. In some cases it is clear that glasses will be needed long-term and if this is the case your Orthoptist will advise you of this. However, in most cases we have to watch and wait. The long-term outcome depends on Mother Nature and we are not able to predict this.

## If vision stops developing at the age of 7 to 8 why will my child still need glasses?

Visual development within the brain stops or slows by around this age so it is important to correct any problems by this age. Once visual development in the brain has stopped it is difficult to improve vision further. However, even though the visual cells may have stopped developing there may still be a focal error within the eye, so lenses may still be needed to ensure the image is in focus on the retina so that the brain sees to its full potential.

## How long before we can expect the vision to be normal?

We allow for approximately 18 weeks of full time wear (adaptation period) (1) of glasses for the vision to improve. We will usually review your child approximately 3 months after the glasses have been issued and then 3 months later.

## Will my child need a patch?

Patching is prescribed when there is a difference in the level of vision between two eyes. If after the 18 week adaptation period one eye is still reduced compared to the other, the Orthoptist will discuss this with you. Patching does not change the need for the lens. It simply allows the brain to use the weaker eye so the visual cells can be stimulated to develop.

**If you have any questions about the above information, please ask the Orthoptist at your next appointment where we will be happy to answer your questions.**



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