CENTRE FOR
Eye Research
Australia

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Keeping young eyes healthy

What you can do to protect your child's vision for the future

Hope in sight®

This guide contains general information relating to eye health and is intended for informational purposes only. This information is not intended to be used as medical advice and does not guarantee any outcomes. Please do not use this information for diagnosing or self-treating any health or medical-related condition as this information is not a substitute for professional medical advice, diagnosis or treatment. If you think you may have a medical condition or emergency, please immediately consult a medical or health professional for assistance.

Your child's eyes

Vision is crucial to your child's development. It helps them learn, play, socialise and explore their world.

In Australia, about one in five children have an undetected eye problem.

Parents and carers can help their child develop the best vision possible in each eye by recognising and acting on signs of eye problems early.

This guide gives you a snapshot of some of the conditions that can affect young eyes, ways to protect your child's eyes and the milestones and signs to look out for.

It also looks at some of CERA's research which aims to protect children and young people's eye health and prevent vision loss in the future.

Early milestones

Babies are not born with sharp vision.

It develops in the months and years after birth as they grow and learn skills such as how to focus and move their eyes together at the same time. The major milestones of vision and eye development are:

Birth	Baby reacts to bright light, is attracted to faces and is occasionally or briefly cross-eyed.
1 month	Looks at faces, starts to follow moving objects and returns your smile.
2 months	Recognises your face and follows moving objects easily.
4 months	Focusses on toys, starts to reach and grasp toys and has straight eyes at all times. The eyes are able to move freely in all directions.
12 months	Picks up small objects with thumb and forefinger.
Up to 8 years old	**Continues to develop sharp vision.**

If you're concerned a milestone has not been reached, consult a doctor or your maternal and child health nurse. Some eye problems that appear when a child's eyes and vision are still developing can cause long-term vision loss.

Your baby's eyes

Our babies grow and change so quickly, it can be difficult to know what's normal and what's not.

Babies can look cross-eyed for brief periods as they learn to use both eyes together. This is normal. But by four months of age, the eyes should be straight at all times.

Sometimes, the wide bridge of your baby's nose can make an eye look like it is turning inwards. This can be more obvious when your baby looks sideways.

But as their face grows, the wide bridge of the nose will reduce and they will appear to grow out of their crossed eyes.

An eye turn (or strabismus/squint), whether wandering inwards or outwards, can significantly affect vision development in a baby or young child.

Early diagnosis and treatment can help vision develop normally. Sometimes, wearing glasses can improve the strabismus; at other times, an eye operation might be needed.

Occasionally, strabismus could be a sign of a more serious eye or health problem.

Occasionally, strabismus could be a sign of a more serious eye or health problem.

If you see an eye turn, even if it's not noticeable all the time, have your baby examined promptly by a doctor.

Image supplied with parent permission.

White pupils

Parents spend many hours looking at their baby's eyes and taking photos. What you notice can be very important.

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The pupil is the small, round hole in the iris (the coloured part of the eye).

Rather than appearing black, sometimes a baby's pupil can appear white (known as leukocoria).

Leukocoria might only be obvious in photos or you might see it with your naked eye.

In photos, it can simply be caused by the angle at which the photo is taken, but sometimes it can be a sign of a serious eye problem.

Rarely, a white pupil could be a sign of retinoblastoma, an eye cancer that occurs in children.

Leukocoria can also be caused by various conditions, including cataract, infection and retinal detachment, which can seriously affect vision and will need to be urgently assessed by a doctor.

It's important to diagnose and treat these conditions as early as possible to help save your child's vision.

For more information visit
cera.org.au/glint-or-squint

Common eye problems

As your child grows from baby to toddler years, here are some other conditions to keep an eye out for.

Conjunctivitis is an eye infection that will occur in most children. It appears as a crusty discharge on the eyelashes at night and a pink or red eye. It is seldom serious and can get better on its own but because it is contagious, it should be diagnosed.

The two top causes of conjunctivitis are a virus or bacteria, with treatment depending on the cause. Some children will develop allergic conjunctivitis, which requires treatment.

A red, discharging eye can occasionally be a sign of a more serious problem. If your child has a red eye and is sensitive to bright light, seek urgent advice from a doctor.

Blocked tear duct makes the eye water constantly and can cause a sticky discharge. It is very common in newborns and usually fixes itself by the age of one. Watering eyes can occasionally be a sign of a more serious problem. If your child is sensitive to bright light and also has a watering eye, see a doctor straight away.

Ptosis is a condition where the upper eyelid droops over the eye. It can occur in one or both eyes. The drooping eyelid can change the shape of the cornea, causing a vision problem, or block vision altogether.

In most cases, vision loss can be successfully treated with glasses and/or eye patching. If the appearance of the ptosis does not improve over time, an operation will be needed.

When vision is blurred

Long and short-sightedness are very common eye disorders which make it hard to see clearly.

Blurred vision is very common in children.

If your child has myopia (short-sightedness), distant objects will be blurred. If they have hyperopia (long-sightedness), close objects will be blurred.

Myopia and hyperopia occur when light passing through the eye does not focus correctly on the retina (the light-sensing layer at the back of the eye).

These two conditions are types of refractive error.

Refractive error generally starts in childhood, when the eyes are still developing.

Long and short-sightedness cause half of all vision problems in Australia.

Anyone can develop it – both genes and the environment can play a role – but your child will have a higher risk of refractive error problems if family members wear glasses or contact lenses or have had laser surgery to correct their refractive error.

Besides blurriness, signs of refractive error can include squinting, headaches, sore eyes and trouble focussing when reading or looking at a computer.

A simple way to treat myopia and hyperopia is with prescription glasses and contact lenses or, in adulthood, with laser surgery.

When myopia or hyperopia occur in only one eye during early childhood, it can affect how vision develops. This is called amblyopia. Without treatment, the poor vision is permanent. Glasses and eye patching can treat the amblyopia.

Promoting good eye health

Seven ways you can help protect your child's eyesight for the future.

1. Cover your pram to protect your baby's fragile eyes from the sun.
2. Ensure your child wears a wide-brimmed hat outdoors to help protect their eyes from the sun's UV rays. Children's eyes are more sensitive than adult eyes, and UV radiation can cause serious harm to your child's eyes and lead to serious problems as they age.
3. Choose sunglasses that meet Australian standards and have 100 per cent UV protection. Avoid novelty styles, which don't offer adequate protection.
4. Many eye problems can run in the family. If you have a family history of any eye problems that occurred in childhood you should have your child checked.
5. Serve your child food that is good for eye health such as eggs, almonds, carrots, berries, citrus fruit, broccoli, corn, leafy greens, beef, salmon and tuna.
6. Attend scheduled health checks with your maternal and child health nurse and consider an eye check with your local optometrist before your child starts school.
7. **Encourage your child to spend less time on screens and more time playing outside to reduce the risk of myopia.**

Older children and teens

If your child has diabetes they need regular eye checks every two years after the age of 12.

People with type 1 and 2 diabetes are at risk of **diabetic retinopathy**. This complication of diabetes damages the tiny blood vessels of the retina, the thin layer of light-sensing cells at the back of the eye.

It is unlikely to affect your child's vision but, if untreated, can lead to blurred or distorted vision and blindness as they age.

There are no symptoms until the condition is well advanced, which means early detection through eye screening by a specialist is vital.

You can register your child for the national diabetes eye screening program KeepSight at keepsight.org.au

Keratoconus is another disease that typically appears from the age of 16 into young adulthood – but it can also affect younger children.

The disease, which affects the cornea – the clear window at the front of the eye – can lead to major vision loss.

Inherited retinal diseases, a range of rare genetic conditions such as retinitis pigmentosa or Stargardt's disease, generally start in childhood or the teens.

Thankfully these conditions are rare but if you have any concerns you should seek help from an eye care professional.

Where to get help

If you are concerned about any aspects of your child's eyes or vision, seek advice from your family doctor, GP, maternal and child health nurse or optometrist (to find a local optometrist, see optometry.org.au).

Even if you're not quite sure there is a problem, have your concern checked out. It's better that your child's eyes are normal and healthy than an eye problem is left undiagnosed. Untreated problems can lead to serious vision loss and even blindness.

Bright future

At CERA, our researchers are working hard to achieve better treatments and faster diagnosis of eye disease to prevent vision loss, with the hope that all children and young people can enjoy a lifetime of healthy vision.

Research Spotlight 1

Educating parents

As a parent, it can be challenging to know if there is something wrong with your child's eyes or vision.

Parents aren't regularly given information about eye problems in their children or the signs to look out for.

But now, thanks to the work of CERA Research Fellow Dr Sandra Staffieri, more parents than ever are being informed about how to recognise a turned eye or white pupil as signs of potentially serious eye problems such as cataract or retinoblastoma, a rare eye cancer.

They are being told if they notice a turned eye (strabismus) or white pupil (leukocoria) to have it checked out by a doctor, optometrist or maternal and child health nurse. This information is now included in the Maternal and Child Health App and the *My Health, Learning and Development Record* book, given to all new parents in Victoria.

Dr Staffieri has a passion for improving early diagnosis of children's eye problems and studied how to reduce delays in retinoblastoma diagnosis for her PhD, supported by the National Health and Medical Research Council. Her research included developing and evaluating an information pamphlet for parents and carers (with input from parents) to diagnose children's eye problems sooner.

"Early detection is crucial for children's eye diseases," says Dr Staffieri, who is also the Retinoblastoma Care Coordinator at Melbourne's Royal Children's Hospital.

"We want more parents to know the signs of eye problems so they can then take their concern to a doctor or maternal and child health nurse to have it investigated. The earlier we diagnose eye problems, the quicker we can start treatment, and the results can be life-changing for the kids."

Download Dr Staffieri's information for parents at cera.org.au/glint-or-squint

Research Spotlight 2

Cutting myopia risk

Spending time outdoors is critical to protecting children's vision.

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You might know that sending your child outside to play can be good for their physical and mental health, but do you know it can also reduce their chances of developing blurry vision?

A study by Professor Mingguang He, a Principal Investigator at CERA, has found spending more time playing outside can protect children from developing myopia as they grow up.

People with myopia have difficulty clearly seeing distant objects, with the causes believed to be both genetic and environmental.

Prof He is the head of CERA's World Health Organisation Collaborating Centre for the Prevention of Blindness. His research investigated how 40 minutes of extra daily outside activity affected the eyesight of Year 1 school children in China over three years. It found the rate of myopia was cut by 23 per cent compared to children who did not take part in any additional outdoor playtime.

Half of the world's population is expected to have myopia by 2050, as more people take up near vision work such as study and spending time on screens.

"The exact link between outdoor play and healthy eyesight is still unclear," Prof He says. "But we think the link is related to the brighter outdoor light stimulating the retina to release dopamine (a chemical transmitter)."

Research Spotlight 3

Combatting keratoconus

Young adulthood is usually an exciting time, with its stimulating whirl of study, work and socialising.

For some people, however, keratoconus can put an unwelcome brake on their independence.

Keratoconus is an eye disease mostly seen in teenagers and young adults that causes the cornea, the clear window at the front of the eye, to thin and gradually bulge outward into a cone shape.

This can cause problems such as blurry vision, double vision and light sensitivity. In severe cases, it can require a corneal transplant or lead to blindness.

CERA Senior Research Fellow Dr Srujana Sahebjada is working to combat the disease.

Common treatments for keratoconus include prescription glasses, hard contact lenses and corneal collagen crosslinking (a surgical procedure to strengthen the cornea).

But artificial intelligence, advanced imaging and genetic technology are now all part of the fight against the disease.

Recently, Dr Sahebjada worked on developing AI algorithms to identify eyes with early stages of the disease and predict how cases will progress. This work aims to halt the condition and reduce the need for corneal transplants.

"We hope that with our research even more young people will get to enjoy what should be the best time of their lives," Dr Sahebjada says.

1 in 84

Australians aged 20 has keratoconus and, globally, more people are being affected.

Dr Sahebjada's research is supported by the Perpetual IMPACT Philanthropy Application Program, National Health and Medical Research Council, Victorian Lions Eye Research Fellowship and Keratoconus Australia.

Research Spotlight 4

Fighting inherited retinal disease

Some eye diseases can be passed down through families.

That's the case with inherited retinal disease (IRD), a range of genetic eye diseases that cause the cells of the retina to malfunction.

These rare diseases, which include macular dystrophy and retinitis pigmentosa, can lead to vision loss and blindness.

They are the most common cause of blindness in working-aged Australians.

Even five years ago, IRD was considered untreatable. But now there is hope on the horizon. Thanks to advances in gene, stem-cell and other technologies, researchers globally are trialling treatments aiming to halt vision loss and help those going blind.

CERA researchers are working with the University of Melbourne to collate information on the estimated 16,500 people with IRD in Australia.

The team aims to create a national database of people with IRD, explains Associate Professor Lauren Ayton.

"We are asking people with diagnosed IRD to come in for a comprehensive eye examination and, where suitable, genetic testing," A/Prof Ayton says. "We then add their vision details and genetic profiles to the database and check if they'd like to be involved in clinical trials. This means that as new and ground-breaking treatments come up, they're all set to take part."

More than 300 genes are known to be linked to IRD. These genetic errors can be passed down from parent to child, but don't necessarily result in disease.

Be part of the future of eye research

Clinical research is essential for discovering the cause of eye diseases and finding new treatments.

By taking part in clinical trials or studies you can make an invaluable contribution to this research. Clinical research advances our knowledge of eye disease so that we can help more people in the future.

To express your interest in future clinical trials and studies at CERA, sign up at cera.org.au

Most of our trials involve adults or older teens. However, there may sometimes be trials for younger children. Parents and carers must provide consent for children and young people under 18 to take part in clinical studies.

Help us by supporting our research

Our work would not be possible without the generosity of our supporters.

Help our world-leading researchers continue to improve the lives of people with eye disease.

By making a donation you are making a difference too. Thank you.

To donate, please visit cera.org.au or call us on 1300 737 757.

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For more information about how you can help find new treatments and cures for eye disease and support CERA's research.

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