Identifying children with visual disorders - Part 1

Please read this Good Practice Point in conjunction with Part 2 - Supporting families when poor vision is confirmed.

Vision matters: the importance of early detection of childhood vision problems

During early childhood, there are several key points in the development of vision[1]:

- The first few months of life are critical for the development of vision. During this time, infants develop their ability to focus on objects - including their parents' faces.
- The first few years of life are also important for visual development. During this time, children continue to refine important visual skills. These skills are necessary for everyday tasks such as navigation, hand-eye coordination and tracking moving objects.
- Delayed identification and treatment of visual disorders during early childhood can lead to permanent visual loss[2]. It is important to monitor children's vision and seek prompt medical attention if there are any concerns.
- Visual problems during early childhood are relatively common, with an estimated 1 in 20 children having a vision disorder that requires treatment[3].
- Visual impairment with both eyes open is uncommon in childhood[4]. It often co-exists with other disorders and impairments, such as developmental delays, intellectual disability, and hearing loss[4]. It is important to take a holistic approach to a child's health and development, addressing all potential concerns.
- This guide was developed to assist health visitors to appreciate their vital role in identifying infants and children who may have a visual disorder.
- Other useful information can be found in Health for All Children[1].

Overview of visual development

The visual functions, which include acuity (ability to discriminate shapes in space, the most important aspect of vision), depth and colour perception, and the field of vision, develop rapidly over the first years of life. The necessary brain and eye development is dependent on stimulation from the outside world - without this, children will never learn to see. Here are some key milestones of visual development:

- **Birth to 3 months:** At birth, infants have very poor acuity (equivalent to levels seen in 'legally blind' adults). However, infants with normal levels of vision are able to keep their eyes steady, and central, and are able to perceive and respond to shape and form, such their carer's face, or high contrast black and white images. This is the most critical period for visual development - if treatable causes of poor vision are not dealt with in this time, children may never develop good vision - this failure to develop good vision is called 'amblyopia'[5].

  During this period, infants will:

  - Have the initial neonatal and infant eye checks as part of the neonatal and infant physical examination (NIPE) programme[6]

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- **4 to 12 months:** Infants start to develop the ability to perceive more detail, and can judge depth and distances between objects. Their motor systems are also improving, and they develop hand-eye coordination and begin to reach for objects and track moving objects more accurately.

  By two to three years of age, visual functions are nearly at their final levels, although their global development may mean they are still unable to recognise or process complex imagery.

  During this period, children will:

  - Have scheduled routine reviews, giving carers opportunities to raise concerns about their vision or eyes[1].

- **By five to seven years of age**, visual functions reach adult levels. The first eight years of life represent the time when interventions to treat visual disorders can have the maximum benefit, as after this age the visual system loses much of its ability to improve with visual stimulation.

  During this period, children will:

  - Have a childhood vision screening check in school at age 4-5 years.

Although these routine healthy child reviews provide an opportunity for carers to seek advice and help, parents should also be encouraged to raise concerns at any point.

Be vigilant for sight loss – "THINK VISION"

Vision is the sense through which we build our world, and through which we build our understanding of how we interact with others.

As vision is key to all aspects of learning, impaired vision may present as delayed global developmental milestones. Where there is a failure to reach these milestones, it is always worth considering whether poor vision is to blame.

Prevalence of visual disorders

Eye disorders such as strabismus (squint, where the eyes are not straight) and amblyopia (failure to develop good vision) are common, affecting almost 5% of children[7]. Usually, only vision in one eye is affected ('lazy eye').

Children may also be affected by refractive error (a focusing problem in need of glasses correction).

Poor acuity affecting both eyes is uncommon, affecting 1 in 1,000 children[4]. However, the number of bilaterally visually impaired children is much higher in certain populations: children born preterm, children from minority ethnic backgrounds and from families living in deprivation[4].

Some children have poor vision due to brain rather than eye conditions - this is known as cerebral vision impairment. This can be associated with poor acuity. It is also possible for children to have good acuity but have difficulty in interpreting what they are seeing – this is also a form of CVI ('perceptual disorders'). CVI is more common in children born prematurely, or with additional conditions such as cerebral palsy, but can occur in children with no diagnosis.

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Signs and symptoms of reduced vision

Here are some indicators of possible poor vision in young children[1]:

- No apparent response to visual cues, like smiling in response to a smiling parent
- Protesting or resisting having one of the eyes covered, which may be a sign that the vision in the other eye is poor
- Eyes which do not seem to work together and look in different directions (strabismus/ squint)
- Eyes which move around a lot without a clear purpose (a condition called roving eye movements) may indicate poor vision
- Eyes which shake or move involuntarily (nystagmus)

Babies, infants and children at greater risk of undetected poor vision

Children who are known to be at greater risk of having poor vison often have other disabilities or impairments. This may make it harder to be sure what level of vision is present. For example, poor motor skills may be an obstacle to the child responding to visual tests. Poor cognitive development may also prevent the use of routine tests, and a child whose global development is delayed may have several reasons why the visual milestones are not reached in a timely manner.

These children include those with neurodevelopmental disorders, and those born preterm and very preterm[4].

Children living in deprived areas in the UK are also much more likely to have visual impairments[4].

Good practice points for health visitors

- THINK vision at every health check point – Making Every Contact Count.
- Advise families to use the red book to track visual development ('Can your baby see?') and vision-related development ('Your child's developmental firsts').
- The red reflex test, done as part of the NHS Newborn and Infant Physical Examination (NIPE) programme, can be challenging, but is necessary to detect eye problems which needs treatment during the first few months of life (particularly cataract) to avoid irreversibly poor vision. Make assessments on whether the newborn infant screening, within 72 hours of birth, and at 6-8 weeks of age, has taken place, and the outcome. Provide parents with support and encouragement to attend for these examinations and for follow-up investigations if appropriate.
- For children under 3 years, health visitors can make enquiries to find optometrists in their area who are skilled at seeing babies and younger children, so they can direct them to local eye exams if needed.
- If concerned about a child's vision, liaise with the community paediatric team, the community optometrist team (if available), and hospital-based secondary care professionals, in order to ensure timely referral and intervention.

Further resources

Health for All Children https://bit.ly/3UdKhQG

NHS Eye tests for children https://bit.ly/3SepJVL

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