

ision
children

Childrens Eye Health

A report on
screening for

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screening for children*

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Foreword

Good vision is essential during the first few years of life to ensure that children have the opportunity to achieve their full visual, educational and social potential. Obstacles to vision such as squints and refractive errors (long and short-sightedness) during the early years of life can lead to amblyopia ("lazy" eye) which unless detected and treated leads to irreversible visual impairment in the affected eye.

Poor vision can also have a significant impact on a child's educational and social development. If a child cannot see the board clearly or cannot see the words in a book comfortably, they are unlikely to keep pace with their peers.

The UK was one of the first countries to recognise the importance of good vision during these formative years and a system of vision screening was introduced over 100 years ago. However, recent changes in the frequency and organisation of vision screening have widened the gaps in this safety net and there is growing evidence that children with poor vision are "slipping through".

The UK is blessed with well-trained optometrists on almost every high street and eye examinations are free of charge to children under the age of 16. However, children's eye care is still given a surprisingly low priority by many parents and some children are never taken for an eye examination.

Therefore, I fully support this campaign to help raise awareness. However, until we can be certain that the majority of children are under the care of an optometrist, there is a strong case for reinforcing the weakened vision screening net by testing children at key stages of their development.

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Executive Summary

- Vision screening is important to safeguard the eye health of children. Problems not detected during the crucial period of eye development between birth and the age of 7 can lead to lifelong visual impairments.
- Undetected eye problems can seriously damage a child's development not only in terms of eye health but also intellectually and socially. Life chances can be damaged with far-reaching consequences for the person.
- The recommendations in Health for all children Fourth edition by Hall and Elliman (published in 2003) led to the introduction of an orthoptist-led vision screening programme for children aged 4 to 5. All other screening except at six weeks was abolished.
- There are a limited number of orthoptists in the country. There are 663,000 four year olds in the UK but only 1,283 orthoptists registered with the Health Professions Council. In addition to providing visual screening orthoptists also provide hospital orthoptic services as well as support services in ophthalmology clinics.
- There has been no systematic analysis of what is available and how many children are actually being screened.
- Many children have undetected sight problems. Research from Aston University shows that approximately 1 in 10 Year 8 children (12-13 year olds) and 1 in 20 Year 2 children (6-7 year olds) have uncorrected refractive errors and require glasses but do not have them.
- NHS sight tests by optometrists for under 16s are free and would be of great benefit to children many of whom are not being screened by the orthoptist-led programme. Yet take-up is low – in the year ending 31 March 2007 only 22 per cent of under 16 year olds in England and Wales had a free NHS sight test.
- Many children are missing out on vital eye care, putting them at risk of undetected eye problems which if left untreated could affect them for the rest of their life. This report recommends:
 - A nationwide review of the availability and effectiveness of vision screening for children.
 - The raising of awareness of the availability and benefits of free NHS sight tests for under-16s to encourage more parents to take their children to be tested.
 - All children should visit an optometrist for a free NHS sight test before entering school.

Chapter 1 – The importance of good eye health for all children

The most significant eye problems during childhood include:

- Amblyopia (lazy eye), which is a reduction in vision arising from a defect present in infancy or early childhood that prevents the eye from receiving adequate visual stimulation.
- Strabismus (squint), which is the incorrect alignment of the two eyes arising from injury or disease affecting the eye muscles, or the nerve supplying the muscles, or a physical obstruction to eye movement. Strabismus is the commonest cause of amblyopia.
- Defective binocular vision, which is the inability to use the two eyes together in the correct way and which leads to impairment of depth perception. This is a consequence of squint and amblyopia.
- Hypermetropia (longsightedness).
- Myopia (shortsightedness) in older children.

There is little doubt of the importance of eye testing for children. Young children are unable to self refer and if problems are not caught at an early stage they can lead to serious sight problems if left undetected and untreated. For example a squint or astigmatism may lead to permanent visual loss.

A child's eyesight goes through a crucial period of development from birth to age 7. The earlier amblyopia treatment is instigated the greater the improvement in terms of acuity.¹ The UK National Screening Committee says that "there is evidence that early intervention has a beneficial effect" and that "ideally strabismic amblyopia should be treated before the age of 3 years but some improvement can

be obtained later than this".²

Undetected and untreated eye problems in early childhood can have far reaching consequences. From a young age and in particular once entering school children go through a vital learning period. Poor eye sight or eye problems can slowdown a child's progress in school intellectually and socially. Inability to read, see the black/white board, engage with other pupils and play sport can have a disastrous effect on a child. It is not unknown for young children to be placed in special needs classes simply because of undetected eye problems.

The Royal College of Ophthalmologists states:

"A child's health encompasses their physical, emotional and social development and visual loss in childhood can significantly impair progress in any of these dimensions."³

A person's entire life including health, employment prospects and wellbeing can be affected by problems not dealt with at an early age. There is widespread expert agreement on this issue.

The British and Irish Orthoptic Society notes: "Quality of vision is an important factor in leading a full and useful life at all ages. It is crucial to infant development, to a child's education, to employment prospects, to the pursuit of leisure activities and to the enjoyment of retirement. An ocular disability, perhaps initially slight, can become a major visual handicap if not promptly identified and treated."⁴

The Government has agreed with this analysis.

In the document the Government sends to all first-time mothers – Birth to five – it states:

“It is important that any vision problems are identified as soon as possible, particularly if your child has any other disability (cerebral palsy or Down’s syndrome) as visual impairment can cause serious educational and social difficulties.”⁵

While a child may face psychological and sociological disadvantages while going through treatment – for example the treatment of amblyopia may involve an eye patch – the benefits of treatment far outweigh the negatives. The UK National Screening Committee notes: “The treatment of amblyopia, with patching, may not be free of harm and children who wear glasses may be teased, but overall the benefits outweigh this, where there is significant impairment.”⁶

¹ Kyriaci Soteri, A standardised approach to vision screening of children aged 4-5 years old at school entry, City University London, November 2006; Stewart, C. E., Moseley, M. J., Stephens, D.A., & Fielder, A. R., “Treatment dose-response in amblyopia therapy: the Monitored Occlusion Treatment of Amblyopia Study (MOTAS)”, Invest Ophthalmol. Vis.Sci, vol 45, no.9, pp. 3048-3054, 2004; Williams, C., Northstone, K., Harrad, R. A., Sparrow, J. M., & Harvey, I., “Amblyopia treatment outcomes after preschool screening v school entry screening: observational data from a prospective cohort study”, British Journal of Ophthalmology., vol. 87, no. 8, pp 988-993, 2003

² National Screening Committee, Child Health Sub-Group Report on Vision screening, May 2005

³ Royal College of Ophthalmologists, Ophthalmic services for children, 2005

⁴ <http://www.britishorthopticsociety.co.uk>

⁵ Department of Health, Birth to five, May 2007

⁶ National Screening Committee, Child Health Sub-Group Report on Vision screening, May 2005

Chapter 2 – Recent changes to the system

There is considerable debate over the level of vision screening children need, when it should be carried out and by whom. This report will not make a judgement on these issues but instead describe the current situation. From those findings it will then draw some conclusions and recommendations.

Until recently the vision screening system for children involved a neo-natal inspection by a doctor or midwife present at birth which involved looking for obvious problems. At six to eight weeks as part of the physical examination set out in Birth to five the eyes would be checked. At such an early stage the more obvious problems are checked for such as congenital cataracts, squint or retinopathy of prematurity in those at risk.

Pre-school screening was then carried out by a health visitor (at age 3½) and during the school years school nurses would carry out visual screening at regular intervals. Variations in regularity and who carried out the tests occurred across the country depending on area and the school. Tests tended to occur at ages 5, 7 and sometimes 11. School age screening was aimed at detecting reduced vision due to amblyopia not detected as part of the pre-school programme, new onset of refractive errors, binocular vision problems and colour vision defects.⁸

The fourth edition of *Health for all children* edited by David M. B. Hall and David Elliman (2003) would make policy recommendations on children's eye care that once approved by the UK National Screening Committee were introduced by the Labour Government.

While agreeing that the test at six weeks

should remain in place, Hall and Elliman argued for testing to be carried out at school between the ages of 4-5, describing this as the "gold standard":

"Universal vision screening of all pre-school children is carried out in many areas by doctors or health visitors, but it has a significantly lower yield and less satisfactory sensitivity and specificity than a programme involving orthoptists. Testing before the age of 4 years appears to produce too many unreliable results for a satisfactory screening programme. Waiting until all children are in school at age 5 years may result in a less satisfactory outcome for the treatment of amblyopia. Therefore, on the evidence available, the Working Party believes that the gold standard would be an examination of all children between 4 and 5 years age. This programme would remove the need for a further test at formal school entry at age 5 years. However, universal coverage may still be a problem in the pre-school years and it is as yet uncertain whether orthoptists will be in a position to deliver such a programme."⁹

Health for all children argued that testing in schools is more effective – despite the fact that earlier intervention is more effective – because it allows more children to be tested and is more economical:

"The detection of vision defects in school is easier and therefore cheaper than in pre-school years because school children are a 'captive population' and high coverage can be achieved easily."¹⁰

Hall and Elliman also argued that the benefits for continued eye testing during the school

years is not known:

“New cases of myopia and other vision defects continue to present throughout the school years, raising the question of whether and further universal screening is needed after school entry The role of vision screening after school entry remains controversial – the disability caused by uncorrected refractive error, the need for further screens, the number of occasions, and the optimal ages have not been established.”¹¹

Therefore they argued that if an effective orthoptist-led pre-school screening programme is put in place all further screening should end:

“Screening of vision at school entry and during primary school years should cease in areas where a satisfactory pre-school (4-5 years old) orthoptist screening programme has been established.”¹²

All screening programmes in the UK are assessed by the National Screening Committee. The Committee’s policy position on “vision defects” states:

“The NSC agreed with the recommendation in Health for All Children 4th Edition that screening for vision defects in 7 yr old children be discontinued. Screening for visual impairment between 4 and 5 years of age should be offered.”¹³

The Committee followed the same arguments as Hall and Elliman when it comes to the previous pre-school test at 3½ years noting the poor take up:

“Screening is relatively low cost and substantially reduces other eye clinic costs by ensuring more appropriate referrals and keeping many cases away from eye OPD altogether. However, if there were to be a pre-school screen in 3 – 3½ year olds coverage would be <70% and another universal test in school would be needed. This would be much less cost –effective. This is one of the reasons for recommending abandoning the preschool test once a high quality 4-5 year old screening programme is in place.”¹⁴

Following the recommendations of Hall and Elliman, the Government’s *National Service Framework for Children, Younger People and Maternity Services*, published in 2004, planned for a “national orthoptist-led programme for pre-school vision screening to be introduced”¹⁵ for children aged 4-5.

⁷ Department of Health, Birth to five, May 2007

⁸ Kyriaci Soteri, A standardised approach to vision screening of children aged 4-5 years old at school entry, City University London, November 2006

⁹ Health for all children, Fourth edition, Edited by David M. B. Hall and David Elliman, 2003, page 238

¹⁰ Health for all children, Fourth edition, Edited by David M. B. Hall and David Elliman, 2003, page 239

¹¹ Health for all children, Fourth edition, Edited by David M. B. Hall and David Elliman, 2003, page 239

¹² Health for all children, Fourth edition, Edited by David M. B. Hall and David Elliman, 2003, page 243

¹³ UK National Screening Committee’s Policy Positions, National Screening Committee, July, 2007

¹⁴ National Screening Committee, Child Health Sub-Group Report on Vision screening, May 2005

¹⁵ Department for Education and Skills and Department of Health, National Service Framework for Children, Young People and Maternity Services, Core Standards, October 2004, page 30

Chapter 3 – Are children being screened?

When responding to questions regarding the sight testing of children Ministers have referred to the orthoptist-led programme for 4–5 year olds as recommended by Hall and Elliman and the National Screening Committee.

For example in April 2007, Ivan Lewis responded in a written answer to a question on the improvement of ophthalmic services for children by saying:

“The National Service Framework (NSF) for Children, Young People and Maternity Services set out a 10-year programme to improve children's services. The NSF highlighted a need for an orthoptist-led programme for pre-school vision screening. Local agencies have the flexibility to plan and prioritise how the NSF standards should be met.”¹⁶

There are serious concerns that the orthoptist-led service referred to by the Minister is failing to screen all children. The small number of orthoptists points to this conclusion. As of October 2006 there were 1,283 orthoptists registered with the Health Professions Council. Historically the number of orthoptists has remained around the level of 1,200–1,300. According to latest estimates from the Office for National Statistics the number of 4 year olds in the UK is 663,000.¹⁷

Of the 1,283 orthoptists registered with the Health Professions Council in the UK, it is unlikely that all are practising or in full-time employment. Even if they were every orthoptist needs to see roughly 517 children each in a year to ensure that all children are tested in an orthoptist-led screening programme.¹⁸ In addition to providing visual

screening orthoptists also provide hospital orthoptic services as well as support services in ophthalmology clinics.

Hall and Elliman themselves raised concerns about the possibility of an orthoptist-led programme managing to actually screen all children:

“However, universal coverage may still be a problem in the pre-school years and it is as yet uncertain whether orthoptists will be in a position deliver such a programme.”¹⁹

The House of Commons Health Committee has expressed concern at the current situation noting that “full screening of school age pupils does not now take place everywhere in the country”. It recommended that “sight tests for all children be reintroduced”.²⁰

There is currently no systematic analysis of the orthoptist-led vision screening service for children in terms of levels of provision or effectiveness.

Free NHS sight tests

All children under 16 are entitled to a free NHS sight test by an optometrist. However take up of this service is low. In December 2002 research undertaken by Taylor Nelson Sofres for Guide Dogs showed that 34 per cent of parents with five to 16-year-olds had not had their child's eyes tested in the previous five years.

The latest statistics show that in the year ending 31 March 2007 only 2,261,995 children aged 0–15 received a free sight test in England and Wales²¹ out of a total of 10,235,200 under 16 children in England and

Wales,²² Therefore in the year ending 31 March 2007 only 22 per cent of under 16 year olds in England and Wales had the free NHS sight test they were entitled to.

Inequality

There is also concern that the current system is inequitable. Parents from lower-socio economic backgrounds are less likely to be aware of the free eye tests available at optometrists. They are also more likely to be put off taking their children for an eye test because of the perceived cost of spectacles. However all children are entitled to a NHS voucher which will pay for a pair of glasses.

Hall and Elliman note that “there is evidence that those adults who are socially disadvantaged are less likely to have their eyes tested and more likely to have undiagnosed treatable eye diseases, including refractive errors. If this is also true for children, a further universal vision test may be needed to offer more equitable care.”²³

The state of children’s eye health

There has not been a significant amount of research carried out into the state of children’s eye health. However, research from Aston University has shown that a large proportion of children are still being left with untreated and undiagnosed sight problems – approximately 1 in 10 Year 8 children (12-13 year olds) and 1 in 20 Year 2 children (6-7 year olds) have uncorrected refractive errors and require glasses but do not have them.²⁴

This research raises serious concerns about the effectiveness of screening at ages 4-5.

¹⁶ Hansard, 17 April 2007, Col. 589 Written Answer

¹⁷ Office for National Statistics, Mid-2006 Population Estimates: United Kingdom; estimated resident population by single year of age and sex, August 2007

¹⁸ In the first year of the introduction of an orthoptist-led screening programme this figure would be much higher (roughly 1,035) as all 5 year olds would also have to be screened. In subsequent years it would only be necessary to screen 4 year olds.

¹⁹ Health for all children, Fourth edition, Edited by David M. B. Hall and David Elliman, 2003, page 238

²⁰ House of Commons Health Committee, NHS Charges, Third Report of Session 2005-06, July 2006, page 20

²¹ The Information Centre for Health and Social Care, General Ophthalmic Services: Activity statistics for England and Wales, 2007

²² Office for National Statistics, Mid-2006 Population Estimates: England and Wales; estimated resident population by single year of age and sex, August 2007

²³ Health for all children, Fourth edition, Edited by David M. B. Hall and David Elliman, 2003, page 239

²⁴ This research is ongoing. Logan NS, Rudnicka A, Shah P, Gilmartin B and Owen CG. The Epidemiology of Refractive Error in UK Children: The Aston Eye Study Methodology. Invest Ophthalmol Vis Sci 2007; 48, ARVO E-Abstract 4847.

Chapter 4 – Recommendations

The evidence on the availability of the orthoptist-led screening programme for children is scant. One of the National Screening Committee’s criteria for a screening programme is that “there should be a plan for managing and monitoring the screening programme and agreed set of quality assurance standards”. The Committee notes that “in most places this is poor” and that “national standards are being considered”.²⁵

We suggest the Government carries out a nationwide analysis of the provision of sight testing for children: what orthoptists, optometrists and school nurses are currently providing across the country and how effective this service actually is.

Once the findings of this review have been carried out the way ahead can be planned. We maintain that the services currently being provided vary hugely across the country with many children not being tested.

If this is the case then we suggest the Government considers making it a requirement for parents to take their child for a free NHS sight test by an optometrist before entering school. Schools could require evidence of a sight test for its pupils. We would further recommend that parents are then obliged to take their child to be tested by an optometrist at regular intervals between during school years up to the age of 11.

Optometrists are well qualified and would be able to provide a convenient and quality service with quick access to all children. If needed further tests or secondary treatment can be carried out by ophthalmologists. The National Screening Committee notes that “testing is not easy and results are poor except if done by a trained person – for practical purposes this means an orthoptist or optometrist”.²⁶

Number of orthoptists and optometrists, 2000-2006

	Orthoptists	Optometrists
2006	1,283	9,102
2005	1,277	8,692
2004	1,234	8,328
2003	1,328	8,140
2002	1,304	7,850
2001	1,303	7,781
2000	1,287	7,490

NB: For orthoptists statistics refer to the UK. For optometrists statistics refer to England and Wales.
Sources: Health Professions Council, The Information Centre for Health Social Care, General Ophthalmic Services: Workforce Statistics for England and Wales, 2007

In the meantime, while the analysis of what is available is being carried out the Government should raise awareness of the availability of free NHS sight tests for under 16s and encourage parents to take their child for a sight test with an optometrist particularly if an orthoptist-led visual screening programme is not available in their area.

- The raising of awareness of the availability and benefits of free NHS sight tests for under-16s to encourage more parents to take their children to be tested.
- All children should visit an optometrist for a free NHS sight test before entering school.

Hall and Elliman argue that:

“Parents should be aware that their child is entitled to free NHS eye examinations up to the age of 16 (19 if in full-time education) by community optometrists, who are trained and equipped to provide the support they need.”²⁷

²⁵ National Screening Committee, Child Health Sub-Group Report on Vision screening, May 2005

²⁶ National Screening Committee, Child Health Sub-Group Report on Vision screening, May 2005

²⁷ Health for all children, Fourth edition, Edited by David M. B. Hall and David Elliman, 2003, page 241

The Government and Primary Care Trusts should also highlight the dangers of not detecting any problems and leaving them untreated. As noted earlier in this report undetected diseases as well as simple refractive errors can cause serious difficulty in later life as well as a slowdown in a child’s progress at school and learning and hence their life prospects. Parents and teachers should also be informed of the signs they should look out for when it comes to children’s eye health.

Many children are missing out on vital eye care, putting them at risk of undetected eye problems which if left untreated could affect them for the rest of their life.

In summary, this report recommends:

- A nationwide review of the availability and effectiveness of vision screening for children.

