Recommendations for eye care in children and young people who have Down's syndrome: for eye-care professionals

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Children who have Down's syndrome are at increased risk of congenital cataracts [1], and the 'red reflex test' should be carried out shortly after birth, and certainly by the age of 6 weeks. Refer if any suspicion of cataract.

Since refractive errors, nystagmus and squint are appreciably more common in children who have Down's syndrome [2], all children should enter a local pathway for a full eye examination before the age of two years. Referral should be made earlier if any parental or professional concerns arise.

The fundus, in particular the optic disc and arrangement of blood vessels can be quite different in children who have Down's syndrome [3], so a dilated fundus examination is recommended at the first visit, to establish the 'normal' appearance for the child.

Children who have Down's syndrome are highly unlikely to emmetropise [4, 5], and can develop significant refractive errors in the early years (birth to four years). Children should be refracted annually, even if the first examination shows no concerns. About 60% will have a significant refractive error by the age of four years. It is important that parents are made aware of the likelihood of errors developing.

Most children who have Down's syndrome have poor accommodative (focusing) responses [6, 7]. Accommodation should be checked in every child, since many will benefit from spectacle correction of low amounts of hypermetropia (long-sight) which would not be corrected in a typical child.

The poor accommodative response means that cycloplegia is rarely needed for the refraction of children who have Down's syndrome. The retinoscopy reflex is likely to be stable and full plus readily attainable without drops, even with the child fixating the retinoscopy light. Refracting without drops means that the accommodative response can be measured on the same occasion as refraction.

Children who accommodate accurately in infancy are much less likely to develop significant hypermetropia or squint [8]. This is useful knowledge for prognosis and planning frequency of eye examinations.

The majority of children who have Down's syndrome will have poor accommodative response even when wearing spectacles for refractive errors [9]. This should be checked at every visit and bifocals prescribed when accommodation for near targets is insufficient [10]. Children can wear bifocals successfully [11] and can be prescribed from the age at which they can sit up reliably. Very young children learn entirely at near, and use a very close working distance, so need clear vision at every age.

Hypermetropia stabilises around the age of four years, although it can reduce a little at adolescence [12]. Astigmatism can arise and increase in power up to the age of around eight years. The axis of astigmatism tends to change from with the rule to oblique in that time, so that the majority of children with astigmatism at age eight years will have oblique cyls [12]. Myopia is much less common and tends to stabilize at around eight years [12]. This means that annual eye examinations should continue throughout childhood.

Myopia in children who have Down's syndrome usually arises in early infancy and the adolescent myopia onset that we see in typical children does not seem to happen in Down's syndrome [12].The accommodative response is poor and suggests a different or weakened response to the perception of blur. For these reasons, there is evidence that current types of myopia control may not be applicable to children who have Down's syndrome. As yet (2024) there are no studies of myopia control in this group of children.

Because of the poor accommodative response, children with myopia can be worse off for near tasks, with their spectacles. Bifocals should always be considered for such children.

Strabismus (squint) is 10 times more common in children who have Down's syndrome than in typical children [13], but management will be similar. Alternating squint is very common and means that amblyopia is relatively rare in Down's syndrome.

Keratoconus is prevalent (10%) in children who have Down's syndrome from the age of about 11 years [14], so annual examinations should continue with particular emphasis on the health of the cornea. The normal cornea in individuals who have Down's syndrome is steeper and thinner than among typical individuals [15, 16], and some signs of early keratoconus in the general population do not arise in people who have Down's syndrome, so identifying the condition at the earliest stage is challenging, but vital if treatment is to be feasible. Down's syndrome should not be a barrier to cross-linkage or contact lens wear.

Developmental cataracts are more common in people who have Down's syndrome [17] and can arise, and progress, very quickly, at surprisingly young ages. Annual eye examinations should continue throughout life.

Visual acuity and contrast sensitivity are reduced in all people who have Down's syndrome, even when the correct spectacles are worn [18, 19]. Expect 2-3 lines poorer than typical norms on an acuity chart at every age (and more if the child has nystagmus). This means that children struggle to access conventional learning materials at school and teachers must make appropriate adjustments. It is essential that parents and teachers are educated about the poor vision.

Ideally, all children will be referred to the local Visual Impairment (VI) service, but criteria for support can vary across areas. Children who have Down's syndrome and nystagmus must be acknowledged to be visually impaired and supported by the VI team.

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