1 FREE CET POINT

OT CET content supports Optometry Giving Sight

ACADEMY FOR EYECARE EXCELLENCE. CIBAVISION

Having trouble signing in to take an exam?
View CET FAQ Go to www.optometry.co.uk

Approved for: Optometrists ✔ Dispensing Opticians ✔

Dispensing spectacles for children

YOUNG CHILDREN'S VISION PART 6 C-18953 O/D

Dr Eirian Hughes, BSc (Hons), PhD, FBDO

Paediatric dispensing is not an official term, but it is considered to relate to children aged 0-16 years of age. Statutory regulations do not permit the dispensing of spectacle prescriptions by unqualified individuals to children under the age of 16 years according to the Opticians Act (1989) and as a result, dispensing can only be carried out by, or under the supervision of, a registered practitioner, ie, a dispensing optician or optometrist. This article discusses the important considerations for dispensing spectacles for children.

Although most spectacles dispensed to children are of low monetary value, children return for eye examinations frequently and a good relationship between the practitioner and the child can be established at an early age. Providing the parents feel that their children are being well looked after, it is likely the whole family will become loyal patients. Paediatric dispensing is, therefore, a good practice builder, as well as being very rewarding. There are various factors that make paediatric dispensing different from adult dispensing. These include the 'duality of the patient', where the dispenser is effectively dealing with two patients – the child and the parent.[1] The dispenser needs to be able to deal with two personalities, each with their own ideals and conflicting requirements. Communication difficulties and an understanding of the psychology involved in dealing with both adult and child present challenges to be overcome. The dispenser also needs skills in handling the parents' reaction to their child being prescribed spectacles. Some parents feel helpless, frustrated, or even like failures, so the dispenser must be prepared for dealing with this and needs to be capable of empathising. The child may not be happy at the prospect of wearing spectacles, which also leads to a more challenging dispense process. There is increased emphasis on getting it 'right first time', as children cannot complain if errors are made. Measurement errors get proportionately more serious than equivalent errors in an adult, as the child's size exaggerates the mistake. Fitting errors in a child can result in discomfort or, in severe cases, facial disfigurement.[2] Children's spectacles are not always prescribed just to correct the refractive error. Children may also require spectacles to correct binocular vision anomalies, such as strabismus, amblyopia or convergence problems, among others. However, compared to adult dispensing, prescription analysis requires additional considerations. These include the patient's mental age, stage of visual development, common ocular problems encountered, visual acuities attained, and any extra information gleaned from the child/parents.[3]

Paediatric frames

When selecting children's frames, many criteria must be met. These are:

- The frame must fit correctly anatomically
- The practitioner needs to ensure that the pupils and lenses are correctly centred
- The frame should be comfortable and durable
- The frame must not hamper the natural development of the nose
- The frame must be aesthetically acceptable

Figure 1
This baby girl wears spectacles to correct her strabismus with a comfort bridge to spread the weight. The frame is of a good size, as the sides do not touch her temples to impinge growth and all weight is supported at the nose and the two ear points

Children are not "scaled-down versions of adults". Their facial features are quite different from a mature adult and, in fact, are still developing, so they require special frames designed for them, not small adult ones. To dispense a child properly, there is a need to understand these differences. Children who have facial features that are atypical may require either a specially adapted frame, or even a hand-made frame. The key features that are important for a child's spectacle frame, compared with adult frames, are that they need to have a:

- Larger frontal angle
- Larger splay angle
- Lower crest height
- Smaller frontal width
- Smaller angle of side
- Shorter length to bend
- Shorter length of drop
- Smaller boxed lens size
- Differing shape of lens aperture
- Shorter back vertex distance

- Pantoscopic angle of zero[4]

When selecting a frame, the boxed centre distance and the patient's pupillary distance (PD) should be practically equal. Myopes should be dispensed with as small a lens blank size as possible, in order to reduce lens edge thickness and weight. Plastic frames should be considered to help hide any edge thickness, and those with wide sides are particularly recommended for high myopes to help hide the edge thickness too, as well as making the frame more durable. All hypermetropes should be dispensed with as small a lens blank size as possible, in order to help reduce the centre thickness and weight of the lenses. Plastic frames, eg, cellulose acetate, can be suitable for children, providing the bridge of the frame is the same shape and width of the patient's bridge. Regular, fixed pad or keyhole bridges are all useful only if the fit is correct. Metal frames, such as plated metal and stainless steel, are valuable to the dispenser, as they can be adjusted to fit many facial dimensions. Titanium frames are extremely useful should the child be allergic to nickel and a hypoallergenic material is needed. Metal frames will have adjustable pads on arms, adjustable comfort bridges (Figure 1) or strap bridges. It is vital that the bridge of the frame, in whatever form, fits properly so that the entire weight of the spectacles is not carried by the crest. This can not only be painful, but also it can cause a permanent ridge to be formed as it will cause adipose tissue to breakdown as the child is still developing. The weight of the spectacles can be evenly distributed over a large area using larger nose pads. This area can be increased by using a strap bridge. For babies, toddlers, and patients who have Down's syndrome and, therefore, are likely to have low crest heights, a strap bridge is a good option to obtain an ideal fit. Silicone-based rubber frames are useful for some babies and children who require indestructible frames. The material is such that it is light and pliable and any frames made from this will not have metal hinges, thereby reducing the chances of facial injury.

Figure 2
A well-fitting curl side

Frame sides

Curl sides can be fitted to metal frames of young children if needs be. However, they can make the patient more reluctant to wear spectacles and so, as soon as the child is happy to wear spectacles, they should be dispensed a frame with drop-end sides, which also look more grown-up. If dispensing a frame with curl sides, the dispenser will need to take length to tangent and total length of side measurements. The curl must stop just short of the ear lobe. A well-fitting curl should sit along the back of the ear, as shown in Figure 2. The curl of the sides should always be covered in silicone to help durability and comfort. For frames with drop-end sides, it is essential that the side is adjusted so that the bend sits at the ear point and the drop should rest along the side of the head. The temple of the frame should not touch the side of the head until reaching the ear-point (Figure 3). If the bend sits too far behind the ear, the spectacles will fall down the child's nose. Ensure there is no excessive drop behind the ear – pay special attention to this if dispensing a frame with a plastic side, as these cannot be cut down. Be particularly aware of this if the child has Down's syndrome, as they will innately have a shorter length to bend compared with other children. Frames with straight or drop-end metal sides should be dispensed to those children with hearing aids. Sports bands are available to keep drop-end sided frames in place and are especially useful should the child need spectacles while playing any sports. Also try to ensure that the frame, where suitable, has sprung hinges for durability. Children today are very brand-conscious and are more likely to wear spectacles decorated with patterns or cartoon characters. If the child wears the spectacles as opposed to refusing to wear them, then the improvement to vision will become marked. Equally, if the child has a spectacles case to feel proud of, they are more likely to produce the spectacles at school and wear them.

Paediatric lenses

Impact resistance and durability are essential characteristics for lenses when dispensing for children. This is because children can be quite "heavy-handed" with their spectacles. There is also a risk of damage/loss while playing. It is important that lenses are relatively thin and light, as decreased weight makes

Figure 3
A well-adjusted drop-end side

wearing spectacles more comfortable. Also, both the child and the parents will be happier with the cosmetic outcome. Protection against ultraviolet (UV) radiation is required, as this is dangerous to developing eyes and skin. Children do not have the intrinsic protection against UV which adults have, and so their spectacle lenses should ideally give full UV protection to at least 380nm. Lens options for children are summarised in Table 1.[5] As children's spectacles need replacing quite frequently in many cases, lens extras such as multi-antireflection (MAR) coatings are usually unnecessary apart from a hard coat to increase scratch resistance. Glass lenses are too dangerous to be dispensed to children, as they are likely to shatter and so should not be considered.

Measurements

Perhaps the most important measurement to take is the PD to ensure correct centration of the lenses relative to the pupil centres. Methods of taking the PD measurement include:

- For those who can fixate accurately and for prescriptions below ±3.00D, take binocular PD using a PD ruler or pupilometer
- For those who can fixate accurately and for prescriptions above ±3.00D or for reasons of facial asymmetry, take monocular PD using a PD ruler or pupilometer
- For patients who struggle with fixation, use a pen torch to locate the corneal reflexes of distance-fixated eyes, measuring the distance between the nasal and temporal corneal-scleral margins, or the distance between the nasal and temporal pupil edges
- Measuring the distance between the nasal canthus of one eye to the temporal canthus of the other eye, or the temporal edge of the limbus of one eye to the nasal edge of the limbus of the other eye
- If a child has a strabismus, each eye must be occluded in turn, and the measurement taken monocularly

If dispensing for prescriptions above ±3.00D and/or selecting high index lenses, the vertical centration of the pupil in the frame should also be measured. Providing the spectacles are for distance use only, the heights should be lowered by 0.5mm for every 1° of pantoscopic angle of tilt. Back vertex distance (BVD) is required by BS 2738 for all prescription over ±5.00D. Bifocals are prescribed to children with convergence excess esotropia, congenital cataract, juvenile stress myopia and Down's syndrome. To ensure that these children use the near segment (usually D28) the heights are set on the pupil centre. Binocular PD is required unless the prescription is high, when monocular PD should be taken. Inset of the segment should also be specified.

Lens material	CR39	Polycarbonate	Trivex	High index plastic
Impact resistance	Good impact resistance	High impact resistance	High impact resistance	Very strong and shatter resistant
Surface durability	Inherent scratch resistance	Very soft	Good resistance to scratching and cracking	High index plastics allow for thinner lenses
UV protection	To 355nm	To 385nm	To 380nm	To 380 – 396nm
Refractive index	1.498	1.586	1.532	1.600 – 1.740
Abbe number	58	30	45	32 – 41
Specific gravity	1.32	1.22	1.11	1.3 - 1.47

Table 1
Characteristics of lens materials for children's spectacles

Figure 4
A brightly coloured children's play area, which can be used to keep the child's attention

Tips for dispensing children

When dispensing children, the following tips may be useful:

- To aid fixation for PD measurements, use a pen torch or brightly coloured pen
- Keep the child occupied with a mirror or a toy
- Carry out the dispense in the play area to make the child feel more comfortable (Figure 4)
- Involve the child in the task. Give a PD rule to the child to play with and let them take your PD if they want to
- Do not be afraid of supporting the patient's head vertically while you take your measurements
- With hyperactive children, ask the parent if they can keep them preoccupied while you take your measurements
- It is often a good idea to ask a parent to stand behind you while you take measurements so that the child will look at you while you take the PD measurement
- Use familiar words when speaking to the child
- Use short sentences and think about the order of words in sentences when dealing with toddlers

- It is best to speak directly to the child while including the parent
- Ensure you are at eye level when you speak to the child; kneel or sit on the floor if need be
- Keep the conversation light and have fun with the child, as it is important that they feel welcome in practice and are happy to return
- Give young children a sticker as a reward when they leave[6]

You will need to address the concerns of the parent and child at the same time. It is important the parents remain fully informed about all aspects of their child's dispense. Explain the likelihood for frequent adjustments as the child grows and the fit of the frame should be checked at regular intervals. Explain how to take care of the spectacles; the child should take their spectacles on and off with both hands and put their spectacles down without scratching the lenses. Reassure parents that it will take time for the child to adapt to their new spectacles. Advise them to choose an activity the child enjoys and one for which the glasses will help, eg reading, and hopefully the child will learn to associate wearing spectacles with enjoyment. Inform the parent that by increasing the length of activity time, the child will eventually realise their vision is improving when wearing their spectacles. Tell parents who wear spectacles themselves that if they wear them in front of their child, it will encourage the child to put on their spectacles too. You could give the parents an old unused frame for the child to put on their favourite doll/soft toy too. Also, ensure the parent is aware that you are available if they have any further queries.

NHS entitlement

Make sure the parent is fully aware of their child's NHS entitlements. All children under 16 years of age who have had an NHS eye examination are entitled to a contribution towards their spectacles from the NHS if there is a change in prescription or through fair wear and tear. Children are likely to break/lose their spectacles and so are entitled to repair and replacement vouchers too. Second pairs are issued under special circumstances after being applied for to the Local Health Board by the child's optometrist or dispensing optician. Generally, second pairs will just be issued to patients aged less than 16 years who are not under the care of the local Hospital Eye Service (HES). HES patients can be issued duplicate vouchers at the hospital's discretion.

Conclusion

It is essential that children are dispensed with correctly fitting spectacles by treating them as individuals and not like mini-adults. It is also vital that accurate measurements are taken, for which a number of hints and tips provided.

About the author

Eirian Hughes is a dispensing optician in charge of teaching dispensing to final year BSc optometry students at the School of Optometry and Vision Sciences, Cardiff University. She is a module tutor for paediatric optometry and eye care for people with learning disabilities for the MSc in clinical optometry. Her BSc and PhD are in medical biochemistry.

References

See www.optometry.co.uk/clinical. Click on the article title and then on 'references' to download.

Module questions Course code: C-18953 O/D

PLEASE NOTE There is only one correct answer. All CET is now FREE. Enter online. Please complete online by midnight on July 13, 2012 – You will be unable to submit exams after this date. Answers to the module will be published on www.optometry.co.uk/cet/exam-archive. CET points for these exams will be uploaded to Vantage on July 23 , 2012. Find out when CET points will be uploaded to Vantage at www.optometry.co.uk/cet/vantage-dates

1. Considering frame measurements, which of the following statements is FALSE?
a) Children have a higher crest height than adults
b) Children have a larger frontal angle than adults
c) Adults have a longer length to bend than children
d) Adults have a smaller splay angle than children

2. Length to tangent and total length of side are two measurements required when dispensing which type of side?
a) Straight side
b) Drop-end side
c) Curl side
d) Loop end side

3. When choosing a child's frame, what should the PD be practically equal to?
a) The lens size
b) The boxed centre distance
c) The frontal width
d) Three times the distance between lenses

4. In a child's frame, what is the ideal pantoscopic angle?
a) 10°
b) 15°
c) 5°
d) 0°

5. For which of the following conditions are bifocals NOT prescribed for children?
a) Convergence excess
b) Juvenile stress myopia
c) Down's syndrome
d) Dyslexia

6. Which lens material that can be dispensed for children will result in the greatest amount of colour fringing?
a) CR39
b) Polycarbonate
c) Crown glass
d) Trivex