

COMPETENCIES COVERED

Dispensing opticians: Professional Conduct, Optical Appliances, Paediatric Dispensing

Optometrists: Professional Conduct, Optical Appliances



An overview of paediatric dispensing

Part 1: Frames and faces

by Andrew Cripps FBDO (Hons)

The Opticians Act (1989) dictates that spectacles can only be dispensed to patients below the age of 16 by (or under the supervision of) fully-qualified and registered dispensing opticians and optometrists. The reasons for this restricted supply are that children present a special case that requires a different approach to dealing directly with adults, and more specialist knowledge.

Appropriate visual experience is essential for the development of most visual functions and it is critical that this experience occurs during a particular stage of a child's development. This stage of development is often called the 'critical period' because if appropriate stimulation fails to occur, it may be difficult, even impossible, to develop that function later. Due to ongoing development of the retina and visual brain, this period extends until about eight years of age, with different processes having different critical periods within that time.

Unequal visual inputs in childhood caused by conditions such as strabismus or congenital cataracts can cause amblyopia, a condition affecting around four per cent of the population, in which vision through one eye, the so-called 'lazy eye', is poor despite the eye itself being healthy. Patching the

better eye can restore the quality of vision through the lazy eye, but only if it is done during the critical period. The accuracy of the visual assessment and any consequent dispensing will, therefore, have a lasting impact on the child's development.

It is often argued that every dispensing, no matter how straightforward or complex it appears, deserves the same degree of attention and expertise, but doing the best that can be done for children requires extra skills and inevitably, a great deal of patience. It should be remembered that a poorly fitting frame could result in lasting disfigurement and it is unlikely that a child will draw attention to any problems unless the frame becomes painful to wear.

The General Optical Council (GOC) has produced a series of competency criteria for dispensing opticians, and one specifically for the restricted supply to children. The Elements of Competence and Performance Criteria for paediatric dispensing reads as follows:

- 9.1 The ability to communicate effectively with the child and their carer
 - 9.1.1 Directs communication to the child in appropriate language and manner
 - 9.1.2 Discusses with the carer as appropriate the factors influencing dispensing
- 9.2 An understanding of paediatric refractive prescribing and management decisions
 - 9.2.1 Understands the methods of refracting

- children and prescribing decisions
- 9.2.2 Understands the investigation and management of children presenting with anomalies of binocular vision
- 9.3 The ability to advise on and measure for the most appropriate paediatric frames
 - 9.3.1 Takes accurate facial measurements
 - 9.3.2 Understands changes in measurements as the facial features develop
 - 9.3.3 Advises on appropriate frames and availability of special features
- 9.4 The ability to advise and measure for the most appropriate lens choice
 - 9.4.1 Advises on lens choice with emphasis on safety, comfort and cosmesis
 - 9.4.2 Measures for lens positioning
- 9.5 The ability to fit, adjust and repair paediatric optical appliances
 - 9.5.1 Fits the appliance effectively and has the ability to adjust and repair the appliance

CRITERIA FOR FRAME SELECTION

It is worth a reminder of the factors that contribute towards the successful fitting of a child's spectacles. Frames should:

- be cosmetically acceptable
- hold and maintain lenses in the correct position
- be safe and hard wearing
- fit properly in all respects
- be comfortable
- be light in weight

This article has been approved for 1 CET point by the GOC. It is open to all FBDO members, including associate member optometrists. The multiple-choice questions (MCQs) for this month's CET are available on page 26 and online. An answer sheet for posted or faxed entries is available for download on ABDO's Dispensing Optics log-in page. **Online entry:** log in to www.abdo.org.uk, and follow the centre section link to 'CET Online'. Please ensure that your email address and GOC number are up-to-date. The pass mark is 60 per cent. The answers will appear in the November 2015 issue of *Dispensing Optics*. The closing date is 9 October 2015.



C-41049

FACIAL MEASUREMENT	FRAME MEASUREMENT
CREST HEIGHT The distance measured in the assumed spectacle plane between the lower limbus and nasal crest (measured for right and left eyes)	CREST HEIGHT The vertical distance from the horizontal centre line of the front to the mid-point of the lower edge of the bridge
BRIDGE PROJECTION The horizontal distance between the assumed spectacle plane and the extremities of the lashes in their most protruding position	BRIDGE PROJECTION The minimum horizontal distance between the back plane of the front and the centre of the back of the bridge
FRONTAL ANGLE The angle between the median line and the and a line representing the average bearing surface	FRONTAL ANGLE The angle between the vertical and the line of intersection of the pad plane with the back plane of the front
SPLAY ANGLE The angle between the assumed pad bearing surface of the nose and a normal to the spectacle plane	SPLAY ANGLE The angle between the pad plane and a normal to the back plane of the front

Table 1. Comparison of frame and facial measurements

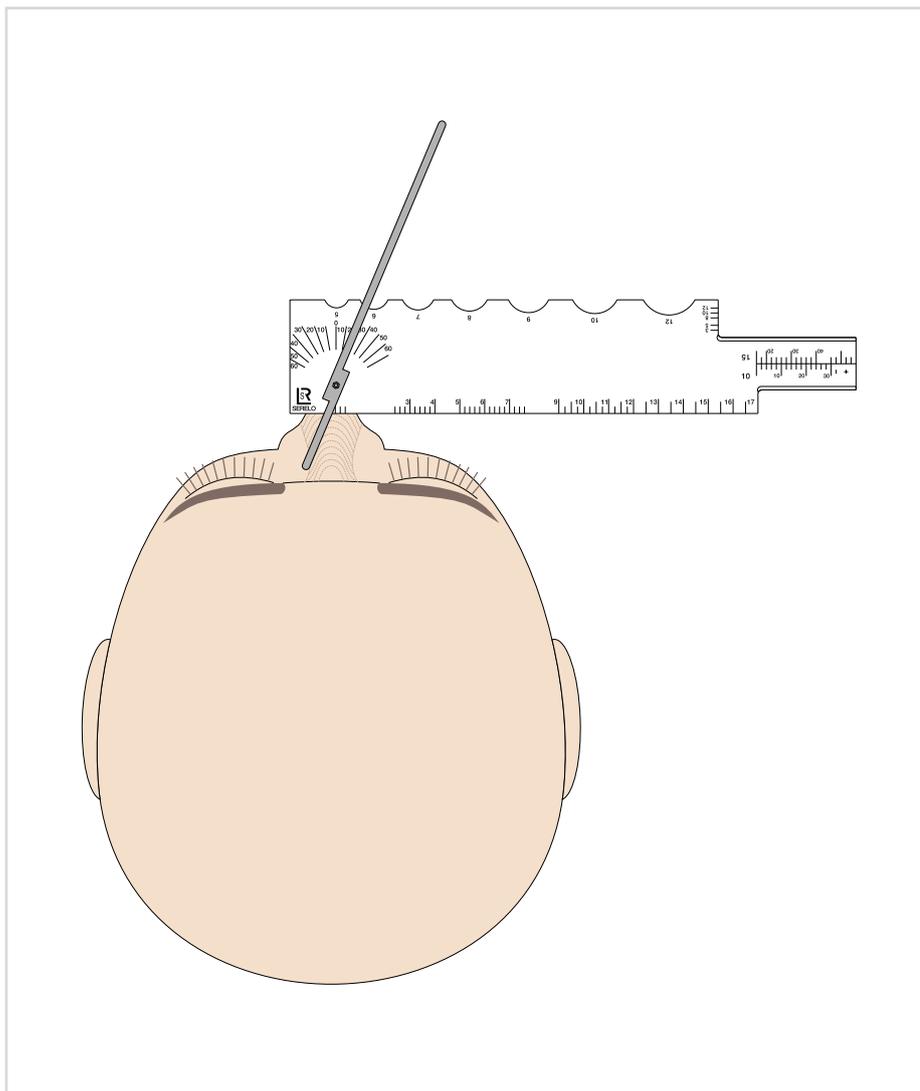


Figure 1.1. Splay angle is the angle between the assumed pad bearing surface of the nose and a normal to the spectacle plane

If the child has a favourite colour it would be helpful to steer them (and of course their parents) towards frames that attract them. Some frames are manufactured from nylon-based materials which, although safe, are prone to warp and lose their adjustment easily. It is the fitting and comfort aspects that are most important and frames should be made to measurements that conform to small faces.

FACIAL AND FRAME MEASUREMENTS

The most important facial and frame measurements in paediatric dispensing are bridge measurements, specifically the crest height, bridge projection, frontal angle and splay angle. The definitions of these measurements are in **Table 1**.

As a child of about four years of age develops into mid-teens it is likely that the four main bridge measurements will change substantially. The crest height is likely to change from being slightly negative to around +5mm and the projection from zero to about +4mm. Similarly, the frontal angle and splay angle will decrease by about 6° and continue to change until growth ceases. Other measurements such as head width, length to bend, vertex distance and angle of side will increase in proportion as the nose structure develops.

Although it is possible to tabulate average measurements for given age groups, other factors such as ethnic background will complicate the picture. For example, Afro-Caribbean children tend to show a wider frontal angle and splay angle and the facial characteristics in children with Down's syndrome between about seven and 14 years of age, do not change with age and rarely coincide with those of other children, either of a similar age or younger.

If a spectacle frame designed for an adult is simply 'scaled down' for a child then the length to bend, box centre distance and eye size can be reduced but it is likely that the projection and crest height will remain the same, so these values will not correspond with the child's features.

Figures 1.2 to 1.4 illustrate how these facial measurements can be taken. The choice of frame can then be aligned with these values so that inappropriate styles are avoided. Even if the child is uncooperative, some idea of the measurements can be assessed.

The pantoscopic angle and angle of side are likely to be less than that for an adult. Also, with the sides located more centrally the child will be less likely to look over the top of the lenses. The two comfort areas, the bridge and the ear points, should

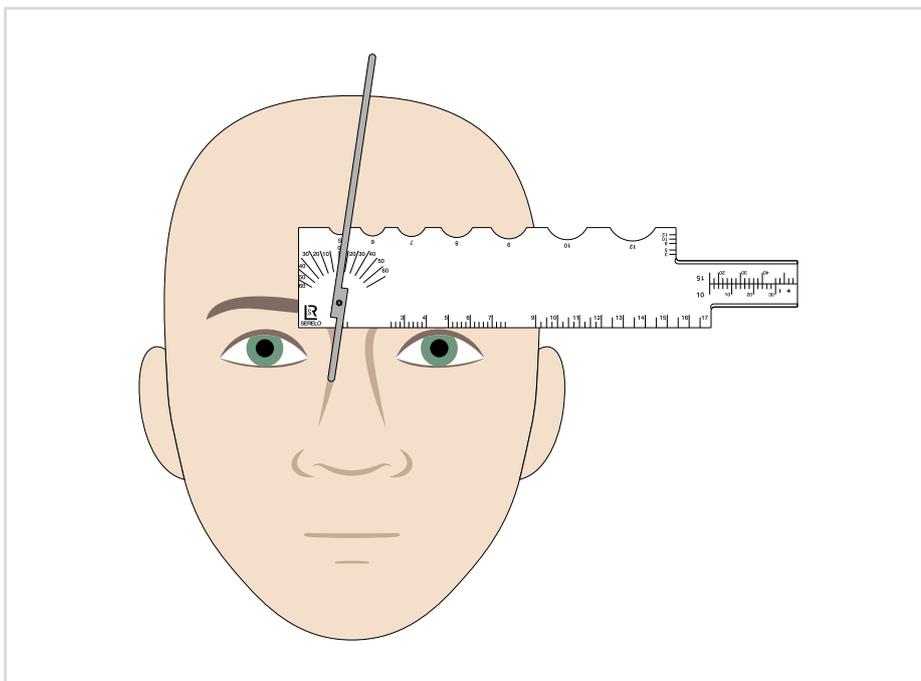


Figure 1.2. Frontal angle is the angle between the median line and a line representing the average bearing surface

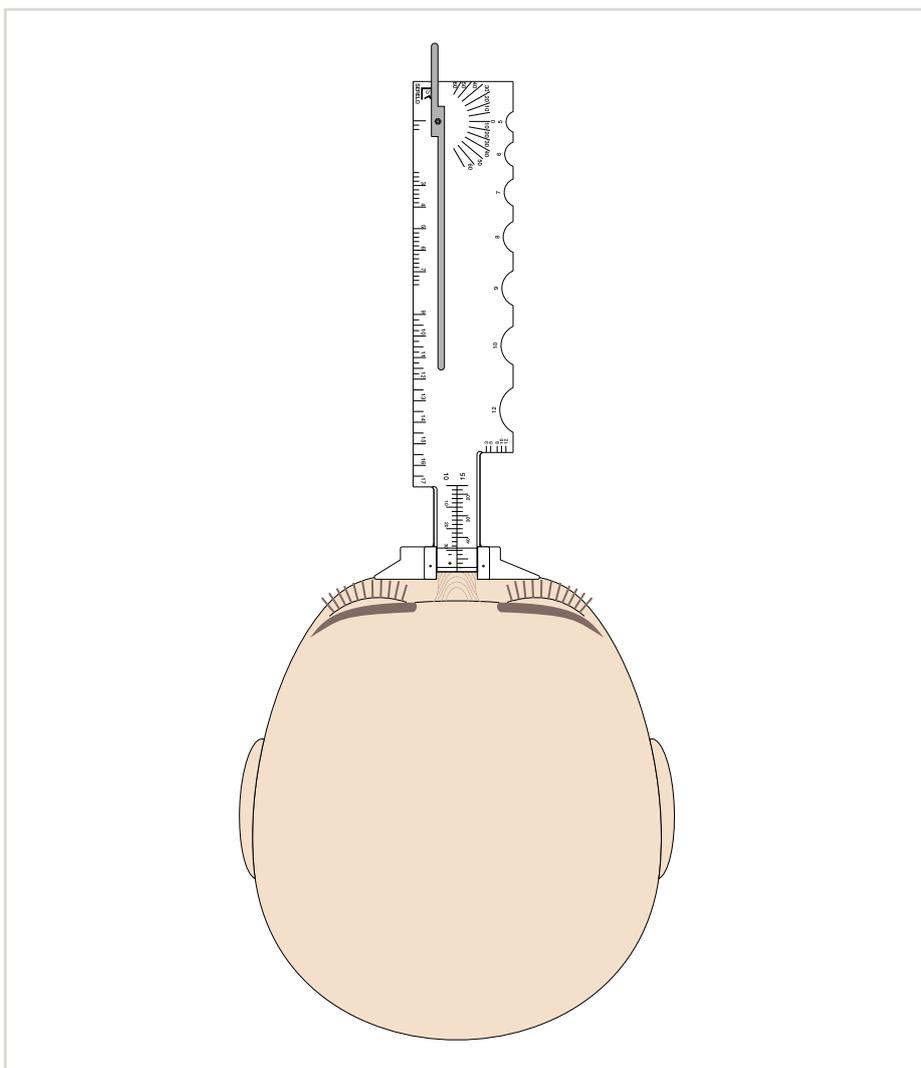


Figure 1.3. Bridge projection is the horizontal distance between the assumed spectacle plane and the extremities of the lashes in their most protruding position

received special attention when fitting the frame as they have soft, easily damaged tissue. Silicone material is ideal for forming bridge contours and covering metal and curl sides. For the very young a single bridge component, or insert bridge, is often preferable to separate pads-on-arms so that weight is distributed evenly over the crest and not just on each side of the nose. An example of this is shown in **Figure 2**.

For drop end sides the length to bend and the length of drop will be significantly short, the latter at about 25mm compared with 35mm or more for an adult. It is not acceptable to simply reposition the bend to create the required length to bend and be left with a very long drop, which can disappear below the collar. Similarly, the total length of a curl side is critical as the extreme end should tuck snugly into the gap behind the lobe and the curl should follow the contour of the ear and rest against the head. Pressure at the ear points and the temple must be avoided otherwise marks will be left in the soft, developing skin. Attention to the angles of let-back and any subsequent bowing of the sides will rectify this.

Unfortunately, the well set-up frame is not likely to stay that way for long and regular assessments of the fit are essential to check if adjustments are needed or perhaps measurements changed.

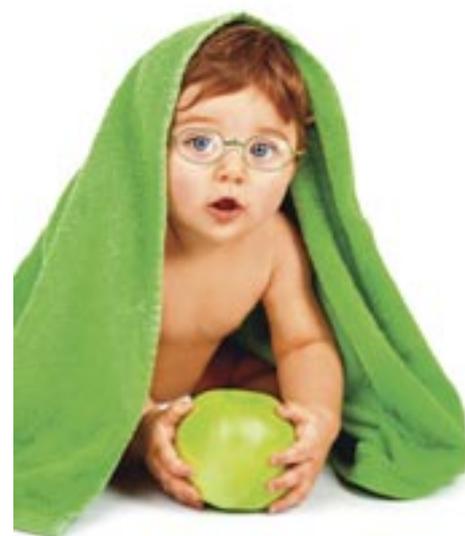


Figure 2. Children's frame with a single bridge component (courtesy of Orange Eyewear)

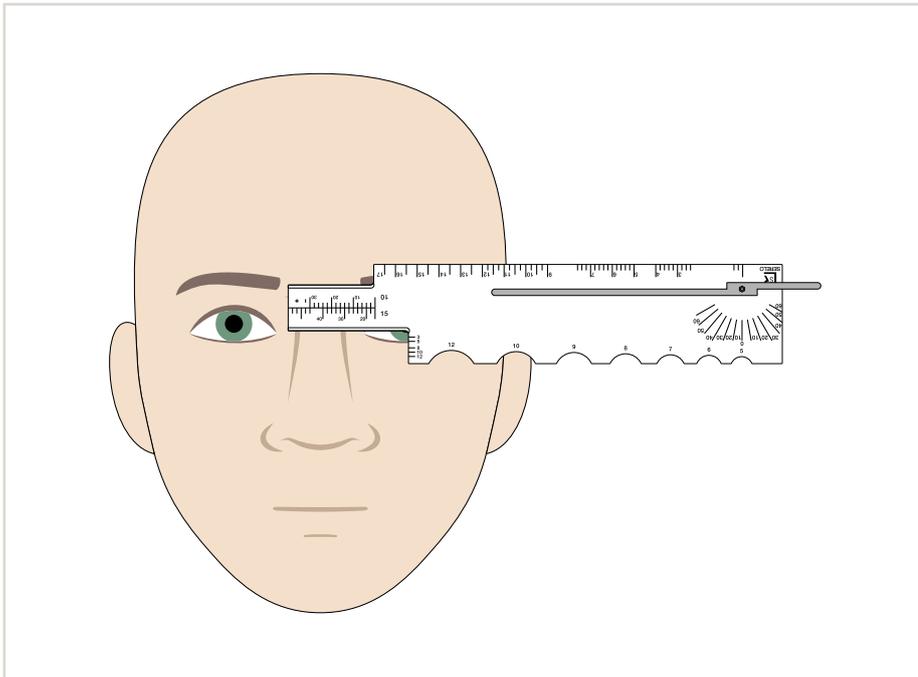


Figure 1.4. Crest height is the distance measured in the assumed spectacle plane between the lower limbus and nasal crest

Figure 3 is an example of a frame with sprung sides, silicone pads on arms and short drop end sides. The position of the pads will determine the height of the frame relative to the pupil and must be adjusted so that the splay angle accurately follows the facial measurement, avoiding red marks and undue pressure. Pads should be adjustable for height as well as splay angle and frontal angle.

Most measurements are easily adjusted on these styles if the correct tools are used. For metal frames it is best to avoid nickel,

or to cover the sides where they touch the temple with silicone tubing, just in case the child should be allergic to the material. Some frames have sides fixed open so there is no likelihood of trapping little fingers.

It can be seen in Figure 4 that considerable thought has gone into providing a frame for this age group that will actually fit snugly around the contours of the nose, even though there is yet to be any significant development in the bone structure. The crest height is relatively low



Figure 3. A typical frame designed for children



Figure 4. Fitting very young children

and the frontal angle wide enough to prevent pinching on either side of the nose.

ADJUSTMENT AND REPAIR OF PAEDIATRIC OPTICAL APPLIANCES

The need for regular assessment of the fit of children's spectacles has already been mentioned. In order to carry out this task and to repair frames, where possible, every practice must have a variety of tools. The following list is not exhaustive and represents the minimum requirements:

- Vice and/or suitable holding equipment
- Heater
- Ruler
- Files with a safety edge
- Reamers
- Screwdrivers and wrenches
- Pliers: rim forming, round nose, flat jaw, parallel jaw nylon covered, half round nose
- Side cutters
- A selection of drill bits and chuck

As with any environment where tools are used, every effort must be made to ensure that they are used safely. A supply of consumables such as nose pads and side tips in various materials and sizes is also desirable. If substantial repairs are indicated it may well be best to start again with new measurements and order a replacement. It may then be possible to renovate the existing pair to act as spares in an emergency.

Part 2, published later in 2015, will consider communication and lens dispensing.

ANDREW CRIPPS FBDO (Hons) is former senior lecturer and pathway leader of the Department of Hearing and Vision Sciences, Anglia Ruskin University. He is a regular CET contributor, an ABDO and WCSM examiner and former member of the GOC's Fitness to Practise Panel.

Multiple choice questions:

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1. Which statement is FALSE regarding the development of facial features?

- a. Projection is likely to become more positive
- b. Crest height will tend to become more positive
- c. Frontal angle will decrease
- d. Splay angle will increase

2. The facial measurement 'Bridge Projection' is defined as:

- a. The minimum horizontal distance between the back plane of the front and the centre of the back of the bridge
- b. The horizontal distance between the assumed spectacle plane and the extremities of the lashes in their most protruding position
- c. The maximum horizontal distance between the front of the frame and the centre of the back of the bridge
- d. The distance measured in the assumed spectacle plane between the lower limbus and nasal crest

3. Complete the sentence correctly. A frame crest height of +2mm indicates:

- a. the bridge is inset
- b. the optical centres should be lowered by 1mm
- c. eye lashes will not touch the back of the spectacle lens
- d. the mid-point of the lower edge of the bridge is above HCL

4. Complete the sentence correctly. The length of drop on a child's frame should be:

- a. carefully adjusted to 35mm
- b. the same length as the equivalent curl side
- c. adapted to the individual
- d. the same measurement for right and left

5. Complete the sentence correctly. Single component bridges are sometimes preferred to pads on arms because:

- a. they are made of a softer material
- b. single components are less likely to break
- c. they have a positive crest height
- d. weight can be distributed more evenly

6. An ideal spectacle frame for children would be:

- a. an adult's style where the measurements have been reduced accordingly
- b. the child's favourite frame style
- c. one which is acceptable to the child, the parents and the practitioner
- d. the cheapest available as they are replaced frequently

THE DEADLINE FOR POSTED OR FAXED RESPONSE IS 9 OCTOBER 2015. The module code is C-41049.

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