Pathway for dispensing to children

A reference guide for ABDO members

Association of British Dispensing Opticians

Pathway for dispensing to children

Whilst the importance and significance of dispensing accurately fitting spectacles to children is widely recognised as a key function, the intention of this guide is to offer a more comprehensive pathway to ensure the highest standards of dispensing are achieved on every occasion.

The key elements required to achieve this objective, when dispensing an optical appliance, are prescription interpretation, spectacle frames, spectacle lenses, facial measurements, verification and the fitting of the appliance. When referring to a 'dispense' for a patient, these key elements cannot be considered in isolation.

A registered dispensing optician's or optometrist's responsibilities when dispensing a pair of spectacles can be summarised as follows:

- Receiving a prescription from a prescriber or from the patient
- Analysing the prescription, ensuring that the prescription is unambiguous, interpreting its contents and discussing the prescription with the patient/parent
- Providing advice on the suitability of spectacle lenses that would fulfill the requirements of the prescription
- Providing advice on the suitability of spectacle frames that would be appropriate for both the required lenses and the patient's needs
- The optician should always remain the dominant force regarding the frame and lens selection, rather than the parent(s) or the child, to ensure the resultant spectacles meet the required standard - in some instances the wishes of the parent(s) or the child may need to be skilfully moderated by the optician to reach an acceptable compromise
- Taking facial, frame and other optical measurements as appropriate
- Processing an order for new spectacles and/or other optical appliances
- Being responsible for the accuracy (to relevant standards) of the completed spectacles and/or appliance
- Fitting and adjusting the spectacles and/or appliance
- Providing advice on the use of the spectacles and/or appliance
- Providing an ongoing aftercare service for the spectacles and/or appliance

GOC registrants have a duty of care to ensure that dispensing to children is carried out in person, or if the function is to be conducted by an individual who is a non-registrant, the optometrist or dispensing optician should ensure that the said individual has appropriate knowledge to undertake this task under supervision. Should the latter be applicable, the professional should maintain a level of vigilance and have means to intervene at any point during the dispensing process.

Indications for prescribing spectacles in childhood

In order to place high importance on the dispensing process, it is wholly relevant to offer an explanation as to why spectacles have been prescribed.

Significant refractive error with visual difficulties

There is no absolute cut-off for prescribing in either hypermetropic or myopic refractive error. The decision to prescribe depends on age, symptoms and degree of refractive error.

Strabismus

In a child with a constant or intermittent convergent squint the 'maximum plus' prescription should typically be prescribed for full time wear. The 'maximum plus' prescription is the result of an objective retinoscopy with the examiner's 'working distance' removed (usually +1.5DS). If a child is noted to have a manifest strabismus and in particular with amblyopia a referral to the Hospital Eye Service (HES) is recommended.

In a child with symptomatic intermittent divergent strabismus it can be helpful to 'under plus' the prescription. If there are any concerns regarding reduction of visual acuity, persistent diplopia, symptoms of headache or nausea not consistent with simple 'eye strain' or an inability to control the divergence then referral to HES is recommended.

Accommodation dysfunction

This is more common in children with Down's Syndrome and brain injury. These children benefit from assessment of the quality of their near vision, particularly in comparison to their distance vision. If near vision seems poorer than expected compared to distance vision and there is an associated history of near visual difficulties, then dynamic refraction can be useful to identify accommodation dysfunction. 'Near sphere' spectacles should be prescribed, either as bifocals or separate single vision lenses, the choice will depend on the nature of the child. Generally in children with more profound special needs single vision 'near sphere' glasses are often more beneficial.

In the fusional period of infancy orthoptists, ophthalmologists and optometrists have a small window of opportunity to act - typically two to four years from detection to try and correct reduced vision and squints. In the case of amblyogenic conditions, patching, penalisation, spectacles or contact lenses are the main treatment options currently available; spectacles being the primary method of treatment.

Ultimately ophthalmologists can surgically intervene to correct squints, but this is typically only attempted after all other avenues have proved unsuccessful; so it is extremely important that any paediatric optical appliance is dispensed accurately from the very outset.

Therefore it is very important to have the spectacles dispensed by a qualified person who has regular experience of dispensing, not just examining eyes, to ensure that the child is provided with an optical appliance to accurate measurements and that it is fitted correctly. This becomes much more relevant if the child has an amblyogenic condition and is even more acutely important if there is anisometropia present, as it is imperative that the child is not given the opportunity to bypass the prescribed correction by looking over the top of the spectacles.

Support mechanism

It is inevitable that there will be occasions where both the child and parent will find it difficult to come to terms with the realisation that spectacles are required. The child needs time to feel positive about the imminent changes in their life and understand why they need to wear spectacles. Similarly, when the eye examination takes place in practice, it is sometimes best not to proceed with frame selection right away. Often, best practice would be to introduce the concept of spectacle wear by showing one or two frames and making the child aware of the surroundings and people involved in the process. It is not unusual for a selection of frames to be taken away by the parent to commence the process in the comforting and familiar surroundings at home. Getting accustomed to the feel on the nose, behind the ears and the general appearance will almost certainly be advantageous at this stage.

It is vitally important that the practitioner is conscious of the psychological impact that this may cause. In situations like this there must be a great deal of compassion and understanding demonstrated by the practitioner. Providing a comprehensive explanation of what is involved during the provision of spectacles, as well as outlining ongoing care elements, will ensure that a degree of trust is established by both the child and parent towards the practitioner.

Dispensing to a child is a highly skilled and complex competency that requires a significant degree of patience on the practitioner's part to achieve the desired results. Unlike dispensing to an adult, it is likely that the child will visit the practice more frequently between eye examinations for various spectacle repairs. Again by outlining the professional services provided during initial and ongoing discussions, many unfortunate situations where the spectacle performance and eye development is hindered due to ill-fitting spectacles will almost certainly be avoided. Care must be taken to educate the child and parent as to what is correct in terms of fitting and comfort. Should there be a deviation from what is deemed correct, there should be immediate provision made by the parent to have an alteration carried out.

Process

The following information proposes a framework or approach that may be adopted to ensure that children are fitted with the best spectacles their parents choose to afford. This process is intended to be applicable and pragmatic in practice.

The intention is to suggest a process which ensures the parent is informed about:

- The best eyewear solution for their child
- Their NHS entitlement
- Other relevant alternatives

Sometimes a dispensing optician or optometrist can forget that they are dealing with people, it's not just about the eyewear; hence it should always be remembered that a person has to wear the results of the dispensing being undertaken. Put simply it's worth asking every time, "Would I wear those spectacles?" or, "Would I let my son/daughter wear those?" or even, "Am I proud of that job?"

Lens selection

The choice of lenses involves consideration of several factors including but not limited to the following:

Price

The NHS will make a contribution via the voucher scheme towards the costs of children's eyewear. While the current voucher values are set at a level of around half the normal retail prices for basic hard resin (CR39) lenses, most practitioners accept the voucher as a means of payment for the spectacles. Additionally the voucher can be used as part payment towards better frames and lenses.

Lens material

The best lens option for a high myopic patient is entirely different to the best lenses for a hypermetropic patient with a squint, yet most children, regardless of Rx, are wearing conventional CR39 whether it's stock or surfaced lenses. Furthermore, we have to consider that these lenses are being worn by children who are more likely to be careless, enjoy some rough and tumble and less likely to clean and care for their spectacles than adults, therefore additional lens surface treatments can be highly desirable.

CR39 hard resin is the standard ophthalmic lens material in the UK today. This is because it offers a good balance of clarity, durability, lightness of weight, scratch-resistance and low price.

Trivex (PNX, Trilogy) is thinner, lighter and substantially more impact resistant than CR39 with equally good optical properties, UV absorption and chemical stability. Ideally Trivex should be considered as the first choice tougher option for most children with low to medium prescriptions and for sports eyewear.

Polycarbonate is an extremely high impact material often used for children's spectacles. Together with Trivex it should be considered at the very least for dispensing of children, but in particular for sports eyewear and for those with a history of spectacle breakages.

Glass lenses should never be dispensed to children.

Increasing the index

Children with higher powered prescriptions may appreciate thinner, lighter lenses just as adults do. It is the responsibility of the dispensing optician to ensure that a lens with a higher refractive index will in fact be thinner and/or lighter than a lower index material on a case by case basis.

In general, it could be assumed that a lens material of refractive index 1.74 is the highest index available hence it will be the thinnest option. However, experience tells us that on a small diameter, due to 1.74 requiring a thicker centre substance, it could be that 1.6 Index is as thin or thinner and offers more durability with better optics.

Single vision fitting position

The vertical optical centres for children have been typically placed on the horizontal centre line (HCL), with the horizontal optical centres measured with a rule. To achieve the maximum potential of any optical correction, the eyecare professional will measure the pupil position in both meridians before ordering the appropriate spectacles and compensate the vertical optical centre for pantoscopic tilt.

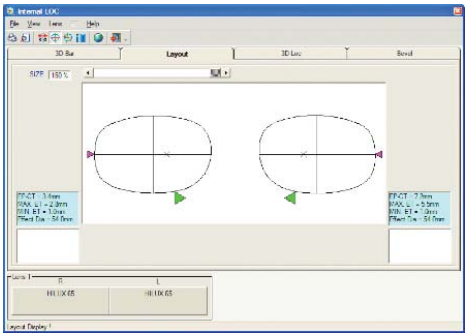
In the case of an anisometropic child this is extremely important to reduce unintentional prismatic effects in primary gaze position. If we are trying to correct an anisometropic amblyopia then we need to eliminate these effects to give the child maximum opportunity to adjust to, cope with and ultimately show an improvement in vision.

In the absence of vertical centration specifications the prescription laboratory will put the centres on HCL. There has been debate that raising the optical centre above HCL in hypermetropic cases will greatly increase lens thickness, when in fact the difference is usually very small.

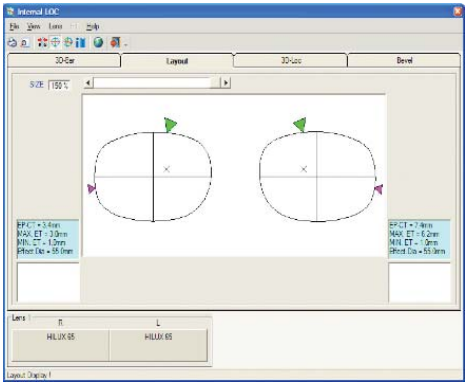
As an example take the case of an average anisometrope aged five:

- Right eye +3.00DS, Left eye +8.00DS
- Metal frame eyesize 44mm, bridge size 19mm
- Monocular PDs Right eye 26.5mm, Left eye 26.5mm

Placing the optical centres on HCL and using an automated system we can show the calculated surfaced right lens thickness on HCL would be 5.5mm:



With the optical centre placed 2.5mm above HCL the calculated surfaced right lens thickness on HCL would be 6.2mm, just 0.7mm difference:



For this child the unintentional prismatic effect in primary gaze has been reduced by 1.25 prism dioptres. This will help this typical child adjust to the spectacles more quickly and increases the chances of overcoming amblyopia.

How to measure children accurately can be difficult as they tend to move about. This can be carried out efficiently by the eye care professional using conventional methods or a modern digital centration terminal.

Bifocal fitting position

In some paediatric cases a bifocal is required and how this is set is quite important considering the use factors. Quite often the bifocal can be introduced at a very early age where the vertical depth of the frame may be 20mm-25mm. Most paediatric bifocal segment heights will coincide with the HCL, however it is accepted that leaving about 10mm of vertical distance as a minimum from bifocal top edge to top rim would be sufficient.

It has been the norm to supply E-line bifocals to children, but you can safely use a large S35mm segment bifocal as an alternative if the distance optical centre is about 5mm above the segment top. This has a much better cosmetic appearance; it can greatly reduce the lens thickness and weight, helping reduce slippage. A large S35 segment bifocal also is easier to glaze into small children's frames and can be easier to keep clean when compared to E-line segment lenses.

Progressive Power Lenses (PPLs)

Children who require a reading addition could potentially benefit from progressive power lenses. If a child has had congenital cataracts removed then it may be appropriate to fit PPLs as they

mature and will give them more scope for studies. Again you should consider a frame with sufficient depth as they may need full reading addition of potentially +3.00 dioptres and compact designs may limit their needs for an intermediate zoned modern active lifestyle.

Coatings, tints and surface treatments

Scratch resistant coatings are obviously of benefit to most children. Anti-Reflection coatings offer similar advantages to children as they do for adults and could be increasingly advantageous for young people who play videogames, spend their virtual lives online and watch many hours of TV. In terms of durability AR coated lenses are more scratch resistant than uncoated lenses, but softer than a hard coat only.

Tinting for clinical purposes has to be dealt with on a case by case basis. Tinting for therapeutic purposes (dyslexia, etc.) are beyond the scope of this guide therefore further specialised advice should be sought. Fixed-tint sunglasses, with UV block, should be encouraged but as separate eyewear.

UV

The cumulative damaging effects of UV exposure is well documented and now readily accepted as part of outdoor lifestyles and skin care. However, UV protection for our eyes is mostly limited to sunglasses where we are required by EC regulations to ensure complete protection. The UV absorption of clear lenses has received less attention. It is said that more than half of our total lifetime UV exposure occurs before we are 18 years old so children are more in need of UV protection than adults. Most optical plastics are either naturally UV absorbing or have UV inhibitors added (to reduce yellowing), even basic CR39 offers 50 per cent UV absorption up to 380nm. It follows, therefore, that a spectacle wearing child's eyes are better, if not completely, protected from UV when compared to their emmetropic friends.

Plastic photochromic lenses provide 100 per cent UV protection all of the time, even when un-activated. They are almost clear indoors and at night, effective sunglasses in bright daylight and good value for money compared to buying a separate pair of sunglasses. Material options and coatings are as extensive as for clear lenses. So in purely practical terms, photochromics have several good points but they are still associated with older spectacle wearers and some say they look undesirable when partially activated and there is a possibility of making a child photophobic.

Frame selection

Frame shape

When considering the frame shape, it should be appreciated that very young and young children ie those up to the age of seven (within the 'critical period'), see the world very differently to an adult, in that much of their everyday viewing is above head height.

There is a trend for shallow frame shapes, however if you are dispensing to children with amblyogenic risks within this fusional period, you need to advise on a frame shape closer to the profile of the eye socket, to ensure that the child is looking through, rather than over, the spectacles. As the child matures the frame shape guidelines can be relaxed allowing the parent and child to select different shapes; however the importance of appropriate and accurate dispensing does not diminish at any stage.

Appropriate side type and length

When advising parents on appropriate frame shapes for children you need to take as much care in selecting the correct side style. Children come in many different sizes, shapes and growth patterns, so you need to select a frame that can be adjusted so the length to bend and length of drop is correct. This should follow the profile behind the ear giving a secure fitting to stop slippage and create stability so the child gets the best optical correction placed before their eyes at all times. Do not forget that, where circumstances dictate, curl and loop end sides are available.

There has been a trend for a skull fitting style for adults but this is not appropriate for children as they are far more active.

If the child requires a shorter side to achieve the correct fitting, without tips extending down or backwards from the ear, then ask if the manufacturer produces a shorter side. Typically this is not very common, so you need to look at a metal frame with a round section to the side without any thickness changes in the metal at the start of the plastic tip, measure the length to bend, remove the tip and shorten the metal. Re-instate the tip and you have a safe, practical and tidy fitting for you to finally adjust and for the child to wear safely throughout the life of the spectacles.

1. **Pull plastic end tip off revealing metal core.**
2. **Cut here.**
3. **Put end tip back on. End tip starts in front of ear.**

Note: *Metal must be of uniform thickness*

Frame considerations

A well balanced frame fit is achieved when three aspects come together. First the sides should run parallel to each other at a tangent to the ear-points, the pupil centres should be just on the nasal side of the vertical centre line and, finally, the pupil centres should be just above the horizontal centre line. Since children come in so many sizes and frames are very rarely individually made there is usually some level of compromise required. Starting at the bridge, young children have small noses that have very little protrusion. From a fitting perspective there's not much to hang frames on. With a plastic frame we need to pay attention to the bridge for there is little that can be done to rectify a poor fit. With metal frames and adjustable toggle pads we have much more scope firstly to adjust the supplied pads and secondly to replace with alternative pads of different sizes and materials.

The single biggest issue here is that spectacles tend to slide down little noses, so we need to ensure that the frame will stay put, securely and comfortably. Also worth considering at this point is to make sure the eyelashes will be clear of the back surface of the lenses. Working out from the bridge we now examine where the eyes sit within the eye rims ensuring that they look balanced and level. On occasion children will have asymmetrical facial characteristics and level won't be possible, if necessary allow for this asymmetry in the fit. In most cases small amounts of asymmetry can be corrected by adjustment at the temples/front joints but some fashion frames have very thick and practically un-adjustable temples. Be aware of this before it becomes a problem considering both splay angle and pantoscopic angle.

With no regard for the dictates of fashion here are some observations on frames:

Plastic: Frames offer more substance to hide thicker lenses.

Metal: Metal frames with toggle pads are easier to adjust. A 'twinned pad' bridge (ie a strap bridge) will spread impact if the frame is crushed against the child's face in the case of a fall.

Supras: Often suitable for stock minus lenses, but need surfaced plus lenses and that makes them thicker.

Rimless: Mounts are less durable but light and comfortable for full time wear.

Thick and fancy: Fashion sides may have limited adjustability.

Finally, should there be a situation where stock frames are proving less than satisfactory in terms of fitting due to facial characteristics, there should always be consideration given to supplying a custom-made frame. By doing so there will be no doubt that the introduction of individualisation will ensure that the child will be wearing properly fitted spectacles specific to their needs. Nowadays this function is very rarely carried out, however it is essential that the paediatrics practitioner retains the necessary skills should this be a suitable and practical option.

Final deliberations by the practitioner

Once the final alterations have been made to the spectacles on the child's face, there should be a final check by the practitioner to ensure they are satisfied their work is fit and proper and as a result they are more than happy for the child to leave the practice wearing the spectacles. It is imperative that the child is present and the spectacles are not given out to a parent at this point, it would be unprofessional in every sense to allow spectacles to be released without a final fitting.

The following list covers points that should always be checked before any child leaves the practice:

1. Are the spectacles fitting appropriately taking into account the 'fitting triangle' ie length to bend, length of drop, inward angle of drop?

2. Are the lenses in line with expectation regarding thickness, powers, centration (vertically and horizontally) and material? - conduct an overall quality check and where appropriate a visual check to ensure visual experience meets visual expectations

3. Have you highlighted the fitting process and results to the parents to avoid any doubt as to what is an acceptable wearing position?

4. Have you made clear the provision for repairs and cleaning process?

5. Would you be happy to wear the spectacles and finally but almost certainly the most important factor... is the child happy?

Whilst many will have their own views and thoughts on how dispensing to children should be carried out, there will be unanimous agreement that not a single pair of spectacles can leave a practice without the above checklist being adhered to. The regulatory body, profession and professionals in the UK have a duty to eliminate the poor and often shambolic levels of care and eyewear given to children. Working to and applying specific elements within this guide into an operational routine will go some way to raising standards of care and fulfilling a commitment to provide best possible eye care solutions to children.

Top ten tips

1	Be enthusiastic, become engaged and demonstrate a genuine interest in the child's development through spectacle wear.
2	Develop a relationship built on trust, professionalism and desire to do the best you can for the child.
3	Educate the child and parents on spectacle wear - putting on, taking off, cleaning process and wearing schedules ie all the time, concentrated work, classroom etc., use language the child can understand and consider having little props at hand to make them feel more comfortable eg teddies with spectacles.
4	Offer insight into appropriate lens choice explaining advantages and benefits - build realistic expectation of finished product (particularly hypermetropic patients) to avoid disappointment on collection.
5	Guide on frame selection based on the fitting triangle ie length of drop, length to bend and inward angle of drop, as well as pantoscopic tilt and frame size - never sacrifice visual performance and comfort in preference of cosmetic appeal. Let the child see how good they look and be sure to tell them.

6	Be sensitive to emotions, particularly for those wearing spectacles for the first time - the child needs time to feel positive about the imminent changes in their life and understand why they need to wear spectacles.
7	Ensure that all elements of the dispensing process are carried out in person or are supervised accordingly - be mindful that all of the following points are necessary to complete a dispense and cannot be considered in isolation: prescription interpretation, spectacle frames, spectacle lenses, facial measurements, verification and the fitting of the appliance.
8	Ensure the fitting of spectacles is done in such a way that you are proud and satisfied that no further amendments are necessary unless an accident occurs where further attention is required.
9	Always consider the importance and inclusion of vertical centration measurements in addition to horizontal centration.
10	**Most importantly...** ensure the child is happy to wear their spectacles and you are happy to let them leave your practice.

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Association of British Dispensing Opticians
199 Gloucester Terrace, London W2 6LD
Telephone 020 7298 5100
Fax 020 7298 5111
Email general@abdolondon.org.uk
Website www.abdo.org.uk

www.twitter.com/MembershipAbdo