LEARNING DOMAINS

CLINICAL PRACTICE

COMMUNICATION

SPECIALTY: CONTACT LENS OPTICIANS

PROFESSIONAL GROUPS

Dispensing opticians — CPD PROVIDER — General Optical Council

Optometrists — CPD PROVIDER — General Optical Council

Contact lens opticians — CPD PROVIDER — General Optical Council

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When contact lenses are the best option

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According to available market data, the Association of Contact Lens Manufacturers (ACLM) suggests nearly nine per cent of the UK adult population wear contact lenses[1]. However, while marketing initiatives try to recruit new wearers, the contact lens market is often referred to as a 'leaky bucket' situation, with new wearers coming on board but existing wearers dropping off.

Contact lenses and spectacles represent the primary modalities for correcting refractive errors such as myopia, hyperopia, astigmatism and presbyopia. While both provide effective vision correction, contact lenses can offer distinct advantages in certain situations.

Beyond visual benefits, there are several lifestyle and practical reasons why contact lenses may be more suitable for certain people for certain activities. For example, individuals who participate in sports often find contact lenses more convenient and comfortable compared to spectacles. Occupational needs and lifestyle preferences are also important considerations, and present identifiable cues to encourage a discussion on contact lens wear.

This article explores situations where contact lenses may be the preferrable option, and highlights why dispensing opticians and optometrists should discuss all forms of correction with patients. As part of a clinical consultation, these facilitate informed decision-making aligning with the General Optical Council (GOC) Standards of Practice for Optometrists and Dispensing Opticians[2] providing patients with the best option to suit both their needs and lifestyle.

HIGH REFRACTIVE ERRORS

Providing the optimum type of correction can present a variety of challenges as patients often have unique visual requirements based on lifestyle, health and prescription.

Spectacles can pose challenges for patients with high ametropia. Whilst thick and heavy lenses may lead to discomfort and aesthetic concerns, prismatic effects and distortions can also impact peripheral vision and depth perception. Misaligning a spectacle lens's optical centre from the wearer's visual axis can cause undesirable prismatic effects, resulting in visual discomfort such as asthenopia and impaired vision[3].

Moodley *et al*[3] found 45 per cent of patients from a student population in South Africa were wearing spectacles with misaligned optical centres, and experienced symptoms such as hazy vision and headaches due to the unwanted prismatic effects.

Multifocal spectacles to correct presbyopia, such as bifocals, trifocals and progressive power lenses, have been shown to impair depth perception and contrast sensitivity. One study showed that multifocal spectacle wearers scored significantly worse in depth perception tests and had a higher risk of patient falls than single vision lens wearers[4].

Though the study did not directly identify different focal areas within a multifocal lens design being the specific cause of the increased falls risk, study participants regularly wearing multifocal spectacles were more than twice as likely to experience a fall[4].

Well-fitting contact lenses address these issues as they sit directly on, or align with, the cornea depending on whether they are a soft or rigid gas permeable (RGP) lens – and move with the eye delivering a more stable and precise visual correction. Shen *et al*[5] indicated that RGP lenses can reduce higher order aberrations more efficiently than spectacles, leading to better image quality across the visual field.

High prescription spectacles are heavier due to thicker lenses, which can cause discomfort, pressure marks or even headaches after prolonged wear[6]. Contact lenses, on the other hand, transfer their limited weight directly onto the cornea, providing a lighter and more comfortable alternative that does not burden the ears or nose[7]. They also enable a larger field of view and better peripheral vision, which may be limited by spectacle frames and lens edge distortion.

The magnification produced by a spectacle lens has an inverse effect on field of view through the lens[7] – and some may consider this can produce an aesthetically undesirable appearance which may impact self-esteem as well as induce facial asymmetry for someone viewing the wearer (**Figure 1**).

Contact lenses provide clear advantages for patients with high refractive errors and should form part of patient discussions, enabling an informed decision on the best optical appliance to suit their visual needs.

ANISOMETROPIA

Anisometropia is a difference in prescription between a patient's two eyes and is generally considered noticeable when it surpasses 1.00D. Gross anisometropia is when the differential between the two eyes surpasses 2.00D[8]. This power differential can cause several visual challenges, including blurred or distorted vision, and make it difficult for the eyes to perceive a single, distinct image.

These issues are often not addressed in spectacles possibly due to patients responding that they are not really experiencing issues or that they have learnt to adapt, and are possibly unaware that their binocular vision could potentially be improved[8].

Anisometropia has multiple causes, which can be categorised into axial and refractive ametropia. One of the main causes is axial length asymmetry, resulting in myopia or hyperopia. This is more common in children, when uneven ocular growth can cause permanent disparities in refractive error if left uncorrected[9]. Refractive anisometropia, on the other hand, results from differences in corneal curvature, lens shape, or anterior chamber depth between the two eyes[10].

Acquired factors can play a role, particularly in adults; cataract formation or surgical lens removal can induce anisometropia due to changes in the refractive index or alterations in intraocular lens power selection. Furthermore, retinal or neurological problems, such as retinopathy of prematurity or optic nerve hypoplasia, might impede emmetropisation and contribute to asymmetric refractive development[9].

These aetiologies frequently co-exist and appear variably across age groups; therefore, early detection and effective optical correction are crucial for avoiding long-term visual issues including amblyopia or compromised binocular vision.

Spectacle correction for anisometropia, especially in moderate to severe cases, offers challenges that can have a considerable influence on visual comfort and binocular performance. One issue is aniseikonia, which occurs when unequal lens powers cause changes in the image size received by each eye as a result of spectacle magnification difference. This disparity can impair the brain's capacity to fuse images from both eyes, resulting in symptoms such as eyestrain, migraines, diplopia and suppression of the image from one eye[11].

Spectacle lenses create prismatic effects when the eyes move away from the optical centre of the lenses, which is especially problematic in anisometropic patients due to the asymmetrical powers. This is most noticeable during near tasks, where vertical prism imbalance, particularly in bifocal or progressive lenses, can cause pain and impede reading ability. In cases of severe anisometropia, spectacles may fail to offer functional binocular vision, resulting in impaired depth perception[12].

Contact lenses offer distinct advantages in visual correction of anisometropia, as stated previously; they move with the eye, eliminating differential prismatic effects that can cause visual discomfort. Additionally, as they sit directly on the cornea, they have a spectacle magnification of ≈1; this ensures consistent image size between the eyes making them particularly effective in the management of refractive anisometropia.

The uniformity in image perception provided by contact lenses helps alleviate symptoms commonly associated with anisometropia in spectacle wearers, which often lead to poor tolerance or non-compliance. Consequently, contact lenses should always be considered for achieving comfortable and effective optical correction in refractive anisometropic patients.

IMAGE: Courtesy of Tina Arbon Black

FIGURE 1. High minus spectacle lenses showing prominent edge thickness, minification and image displacement

PRESBYOPIA

Multifocal contact lenses can effectively correct near intermediate and distance vision[13] and improve visual function by minimising distortion and increasing the field of view[14]. Aside from the obvious benefits already mentioned, consideration should also be given to presbyopic patients with neck mobility impairments. Contact lenses utilising a 'simultaneous vision' design, where the brain selects the clear image out of several different powered images being presented at the same time, irrelevant of the direction of gaze, provide an ideal presbyopic solution.

Neck strain during reading activities, resulting from increased extension angles in the cervical vertebrae, has been observed in multifocal spectacle wearers[15]. This occurs because multifocal lenses require specific head movements to access distinct focal zones. To achieve clear near or intermediate vision, wearers often need to tilt their head to align the eyes with the correct prescription zone; this posture may trigger neck pain, particularly in people with restricted cervical motion.

Patients using digital screens, especially when working on multiple monitors or performing lengthy screen-based tasks, also face postural challenges resulting in discomfort. These issues stem mostly from the optical design of progressive or bifocal lenses.

The intermediate zone in progressive lenses is a relatively narrow zone and positioned in the centre of the lens. Thus, users are required to tilt their head slightly backward to look through this zone for prolonged computer use. Over time, this incorrect head posture can lead to neck and shoulder discomfort, especially in users with pre-existing cervical spine or musculoskeletal disorders[16].

Also, there may be an issue with visual misalignment when switching between screens, particularly when using multiple monitors, as each zone of the lens has a defined width and position. This can cause the spectacle wearer to look through unwanted areas of the lens, resulting in blurred or distorted vision.

Furthermore, peripheral distortion in progressive lenses due to the blending of powers across the lens surface is especially noticeable when viewing large displays or looking sideways. In such cases, the screen edges may intersect with distorted regions of the lens, leading to image swim or visual discomfort. This can cause visual fatigue, headaches, and decreased productivity, especially in contexts that require fast shifts between near and intermediate tasks[17].

This again highlights the necessity of contact lens discussions as a primary option for presbyopia correction and educating patients about their benefits[18] (**Table 1**).

FEATURE	PROGRESSIVE SPECTACLES	MULTIFOCAL CONTACT LENSES
Head posture	Often require head tilting to align with intermediate or near zones and may cause neck strain	Natural head position maintained with no need for head tilting
Field of view for screens	Narrow intermediate zone, can cause visual misalignment with screens	Full, central vision correction for all distances
Peripheral distortion	Common due to lens design, may cause 'swim' effect at screen edges	Minimal to none as lenses move with the eye
Multiple monitor use	Frequent shifting of head direction can lead to blurred vision or discomfort	Changing gaze does not change visual alignment
Visual fatigue	Higher risk due to constant head, neck and visual adjustments and misalignments	Seamless focus across distances
Aesthetics and cosmetics	Visible lens segments (bifocals) or distortions (progressive power lenses)	Discreet, no visible difference
Mobility and moving around	Peripheral distortion may affect balance or navigating steps	More natural spatial awareness

TABLE 1.Comparison table of the wearing features between progressive spectacles and multifocal contact lenses

CONTACT LENSES FOR CHILDREN

MYOPIA

Myopia is a growing public health concern, affecting an increasing number of children and young adults worldwide. The focus of effective myopia management is to limit axial elongation of the eye and the chances of encountering risk of long-term ocular complications such as retinal detachment[19], glaucoma[20], myopic retinopathy[21] and cataracts[22].

Contact lenses have become an important option in the management of myopic progression. In the UK, available options include daily disposables, monthly lenses (now including correction for astigmatism) and reverse geometry lenses (orthokeratology), all offering a convenient alternative for active children and teenagers, potentially contributing to improved compliance compared to spectacles. Children often report better handling with contact lenses as spectacles can be damaged or lost during physical activity[23].

To address contact lens drop-out rates, effective patient communication and support are essential. The most common reasons for discontinuing lens wear are discomfort, handling issues or safety concerns[24]. Despite these challenges, contact lenses remain a safe and effective option for managing myopia in children.

CATARACTS

A paediatric scenario is congenital cataract surgery, which results in aphakia, necessitating visual correction. While this is usually an age-related issue frequently seen in elderly patients, it can also occur at birth or shortly thereafter. Juvenile or paediatric cataract refers to cataracts that form after birth[25].

Intraocular lens (IOL) implantation in infants is still a source of discussion in paediatric ophthalmology, particularly due to the balance of potential advantages and associated risks. The Infant Aphakia Treatment Study (IATS), a landmark randomised clinical trial, found that aphakic infants fitted with contact lenses had similar visual outcomes at four-and-a-half years compared to those treated with IOL implants, but with fewer complications and surgeries[26].

The IATS reviewed the results of infants under seven months old who received cataract surgery with primary IOL implantation or were left aphakic and fitted with contact lenses. Over a five-year period, the IOL group had significantly more intra-operative problems (28 per cent versus 11 per cent), adverse events (81 per cent versus 56 per cent), and subsequent intraocular procedures (72 per cent versus 16 per cent)[27].

Additionally, infants younger than six months prescribed IOLs displayed large myopic changes as they aged, frequently resulting in high myopia or severe anisometropia, which may require extra corrective procedures[27].

Given the high rates of adverse events, contact lenses may be considered as the safer, more flexible option for visual rehabilitation in young infants. Young children may also struggle to maintain a stable and accurate spectacle fitting position due to facial anatomy or behavioural reasons. Poorly fitting spectacles can cause uneven vision correction, increasing the likelihood of amblyopia[28].

SPORTS

Contact lenses can benefit children on a day-to-day basis, notably in terms of promoting active lives, sports engagement, and psychological development. Children and adolescents who participate in physical activities frequently find spectacles to be a barrier

FIGURE 2. Benefits of contact lens use in active lifestyles

due to concerns such as frame slippage, lens fogging and reduced peripheral vision[29]. In contrast, contact lenses have a larger field of vision and remain steady during movement, making them ideal for sports and other physical activities[30] (**Figure 2**).

SELF-ESTEEM

Walline *et al*[31] suggested contact lenses could improve children's self-esteem and quality of life by removing the social stigma associated with wearing spectacles. The Adolescent and Child Health Initiative to Encourage Vision Empowerment (ACHIEVE) study discovered that children aged eight to 11 years who wore contact lenses were significantly more satisfied with their appearance and participation in activities than their peers who wore spectacles[31].

Also, current daily disposable lenses lower the risk of infiltrative and inflammatory problems – and are regarded as safe and comfortable for paediatric usage when properly maintained[32].

In conclusion, the advantages of children wearing contact lenses as described in this article, indicate that contact lenses are not just a viable visual correction alternative for children, but can also better meet developmental, recreational and emotional needs compared to spectacles.

KERATOCONUS

Keratoconus and corneal ectasia are progressive, non-inflammatory conditions that cause corneal thinning and biomechanical weakness, resulting in an irregular, conical protrusion that significantly impairs vision[33] (**Figure 3**). These conditions limit the cornea's ability to focus light properly, resulting in decreased visual acuity that is often uncorrectable with spectacles alone, due to optical distortion and irregular astigmatism[34].

The Amsler-Krumeich classification is commonly used to stage the condition, considering factors such as refractive error, corneal curvature, corneal thickness and scarring[35].

Stage I keratoconus is identified by minor myopia and astigmatism, a mean keratometry (K) reading less than 48.00D, and negligible corneal thinning. At this point, spectacles or soft toric contact lenses may be adequate for visual correction.

Keratometry readings in Stage II often climb between 48.00D and 53.00D, with more visible corneal thinning and greater irregular astigmatism. RGP or hybrid lenses may be required for visual rehabilitation as they provide a better optical solution by creating a new refractive surface that conceals underlying corneal imperfections[35].

Stage III requires keratometry readings between 53.00D and 55.00D, central corneal thinning below 400µm, and further use of specialised lenses, such as hybrid lenses, RGP keratoconic designs and scleral lenses. Scleral lenses vault over the cornea and rest on the sclera, creating a stable platform, reducing high order aberrations, and providing good centration and visual acuity[36], giving both comfort and visual rehabilitation by reducing corneal distortion[37,38].

Stage IV, the most severe kind, is characterised by keratometry above 55.00D, corneal scarring, and considerable vision loss that cannot be corrected with spectacles alone, often demanding surgical intervention. Contact lens use has also been linked to psychological and functional benefits; patients commonly report better daily functioning and less visual distortion as compared to spectacle correction[39].

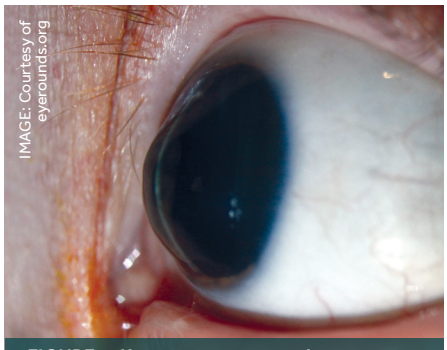

FIGURE 3. Keratoconus protrusion of a left eye in right gaze

One of the most significant improvements in preventing the progression of keratoconus is corneal collagen cross-linking (CXL), a minimally invasive treatment that employs riboflavin (vitamin B2) and ultraviolet-A radiation to create collagen cross-links within the corneal stroma, reinforcing its structure[40]. Clinical trials have indicated that CXL can delay or stop disease progression in up to 90 per cent of individuals – and may even lead to moderate improvements in corneal curvature and vision[41].

Overall, contact lenses offer significant advantages in managing keratoconus providing enhanced visual acuity, a range of lens choices, greater comfort, and sophisticated fitting techniques. They are instrumental in the visual rehabilitation of patients with keratoconus, frequently surpassing the performance of spectacles and serving as an effective non-surgical option for condition management.

FIGURE 4. Hand painted contact lens to resemble a natural appearance of an eye

THERAPEUTIC APPLICATIONS

Hand-painted contact lenses are used to treat a variety of ocular abnormalities, most notably iris coloboma, corneal opacities, albinism and aniridia. These custom-made lenses are an encouraging choice for aesthetic restoration since they closely resemble the natural appearance of the eye, making them appropriate for people with ocular aesthetic concerns[42].

Based on the patient's circumstances, prosthetic lens designs include rigid scleral shells, iris implants, and soft contact lenses (**Figure 4**). In addition to their cosmetic benefits, hand-painted contact lenses can have clinical applications. They can reduce photophobia in patients with iris defects by controlling light entry, and they can occlude vision in amblyopic eyes when standard occlusion therapy is ineffective or impractical[43].

Custom-painted prosthetic lenses for disfiguring anterior segment diseases, particularly those with leukomas or iris coloboma, resulted in high patient satisfaction and increased quality of life in individuals[44].

Contact lenses can help with binocular vision function and psychological well-being, as many patients suffer from distress and social discomfort due to obvious ocular abnormalities[44]. Despite their specialised nature and cost, hand-painted lenses continue to be an important therapeutic tool in ocular rehabilitation, particularly when ordinary contact lenses or surgical procedures are insufficient or inappropriate.

QUALITY OF LIFE

Quality of life is an important concept that encompasses overall well-being and satisfaction in various areas of life, including physical health, emotional state, social relationships, and personal fulfilment. It reflects how comfortable, happy, and capable patients feel as they navigate their day-to-day lives[45].

One of the key benefits of contact lenses compared to spectacles is the convenience they bring a patient. For patients with active lifestyles or occupations involving constant movement, spectacles can prove to be troublesome. A lack of stability affecting vision from the weight of frames and lenses particularly with higher prescriptions mean spectacles may slide down, fog up, or require regular adjustments, leading to discomfort and annoyance. In contrast, contact lenses offer a stable fit and an unobstructed field of vision, enabling users to go about their daily tasks without these interruptions[46].

SOCIAL AND PSYCHOLOGICAL BENEFITS

Contact lenses offer cosmetic advantages that can boost self-confidence and enhance social interactions[47,48]. When comparing contact lenses to spectacles, contact lens wearers are more satisfied with their appearance and other cosmetic aspects[49]. Participants who wore contact lenses instead of spectacles were more likely to increase their self-esteem[48]. For some patients, wearing spectacles may convey negative connotations or contribute to feelings of insecurity about their appearance.

Cosmetic procedures are commonly driven by the desire to improve mental and emotional health, boost self-confidence, and lessen self-consciousness in social and professional environments[50,51]. According to research published in the Archives of Face Plastic Surgery, individuals who had facial cosmetic surgery reported significant reductions in self-consciousness about their appearance as well as improvements in overall satisfaction with their looks[52].

Cosmetic contact lenses are primarily used to improve the appearance of the eyes by changing their colour, pattern, or apparent size, with or without refractive correction[53]. Their aesthetic appeal and application in fashion or theatrical settings have contributed to their increased popularity, particularly among adolescents and young adults. Cosmetic contact lenses offer use in both elective and rehabilitative eyecare, but their safety is dependent on good clinical supervision and patient education.

CONCLUSION

While contact lenses can in many cases be more appropriate than spectacles, assessing each patient's individual needs is essential. It is easy to fall into a routine during consultations, repeating the same advice out of habit but taking time to explore all options including contact lenses can make a meaningful difference in a patient's life, whether for corrective purposes, medical needs, therapeutic benefits, or even holistic enhancements.

Great communication and active listening should guide every appointment. Open dialogue allowing patients to ask questions freely ensures they are fully informed about their care. Dispensing opticians and optometrists are expected to listen and consider each patient's specific needs, preferences and concerns – those few extra minutes of discussion can have a lasting positive impact.

LEARNING OUTCOMES FOR THIS CPD ARTICLE

DOMAIN: Communication

2.1: *Communicate effectively with patients the benefits of contact lenses for sport, high refractive errors and conditions like keratoconus, using professional judgement to adapt language and communication approach accordingly.*

3.1.4: *Explain the benefits and risks of contact lenses and spectacles to patients with complex ocular and visual needs, or specific lifestyle requirements such as sport, to ensure informed and valid consent is obtained.*

DOMAIN: Clinical practice

5.3: *Recognise the optical and visual advantages contact lenses offer patients with high refractive errors and ocular abnormalities and apply this knowledge to inform your clinical practice.*

DOMAIN: CL speciality

Apply an evidence-based understanding of the stages of keratoconus and the selection of specialist contact lens designs appropriate to disease progression.

REFERENCES

References can be found when completing this CPD module. For a PDF of this article with references, email abdocpd@abdo.org.uk

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