FOCUSED ON RUNNING: VISUAL CORRECTION CHOICES FOR RUNNING-RELATED SPORTS

Prof Keziah Latham, Dr Matthew Timmis FCASES, Georgia Dunn, and Dr Andrew Morrison discuss the vision correction options used by runners and orienteers, and identify actions that sports practitioners can take to optimise the vision of runners in their care.

The Chartered Association of Sport and Exercise Sciences (CASES) community will be familiar with prescribing training plans and monitoring the fitness of our clients/athletes. We will also be familiar with the value of what they wear, for example on their feet. But have you ever thought about the visual correction your client/athlete wears, such as spectacles or contact lenses, and how this may influence their adherence or enjoyment of sport?

The aim of this article is to provide sports practitioners with an understanding of the need for vision correction, and some food for thought on identifying occasions when signposting individuals to eyecare practitioners for advice could be beneficial. We concentrate on running as an extremely popular form of recreational sport, and also consider orienteering as a related sport with more specific visual needs.

EYECARE PRACTITIONERS

There are several professionals involved in providing visual corrections within high-street optical practices. In this article the term 'eyecare practitioner' (ECP) is used as an umbrella term, to include:

- Optometrist: conducts eye examinations to determine refractive correction and assess eye health, prescribes spectacles and fits contact lenses.
- Dispensing optician: dispenses spectacles to a provided prescription and may also fit contact lenses.

VISION CORRECTION FOR DISTANCE

Many people need a vision correction for refractive error, with the strength of the correction needed given in Dioptres (D), and higher values indicating more significant errors. The key types (see Figure 1) are:

> Contact lenses should always be fitted by a professional and never purchased online without prescription.

- Myopia (shortsighted): distance objects are blurred but near objects can be seen more clearly. Corrected with negative lenses.
- Hyperopia (longsighted): near objects are more difficult to see than distance objects. Corrected with positive lenses.
- Astigmatism: indicates a difference in correction required at different meridians, with the analogy that the eye is shaped like a rugby ball rather than a football.

VISION CORRECTION FOR NEAR

Most younger adults can use the same vision correction at all distances. To adjust between looking at distance and near, the lens within the eye changes its shape to change focus, a process called accommodation. However, accommodative ability reduces gradually over time and over the age of 40 starts to interfere with routine close work tasks. This natural loss of focussing ability is called presbyopia.

Many early presbyopes initially hold close work further away, reducing the demand on accommodation. Once your arms aren't long enough, common approaches are to get reading glasses if distance correction isn't needed, or to opt for bifocal or varifocal glasses or contact lenses that correct both distance and near vision in the same lens. The lens power that needs to be added on to the distance correction to see at near is called the 'reading add', typically between +1 and +3D.

SURVEYS

Here we outline the advantages and limitations of vision correction choices for two different running-related sports: recreational running and orienteering. Recreational running is a popular sport, and our running survey (Latham *et al.*, 2024) included 941 adult runners needing a visual correction in everyday life. A more niche sport is orienteering, which is more visually demanding as it involves using a map and compass to navigate between a series of set checkpoints as fast as possible, and typically involves reading the map while running through forests or other rough terrain (see title photo). The orienteering survey (Latham *et al.*, 2025) included 469 orienteers aged 40 years plus, since these athletes may need different vision correction for distance and near vision.

SPECTACLES

While contact lenses (CL) might seem an obvious choice for sport, spectacles were actually the commonest form of visual correction used by runners (67%) and by orienteers who needed correction for distance vision (56%). The prevalence of CL wear in the general population is relatively low, and for self-declared 'recreational' runners, seeking an alternative to an adequate spectacle correction may not have been considered.

Spectacles were not a barrier to engaging with running - there was no relationship between the type of visual correction worn and the amount of running people reported doing. The high level of spectacle wear for running indicates it is an accessible sport for those who can only wear glasses and are unable to wear CL.

However, a third of people avoided using spectacles for running, with key barriers to their use being weather related (specifically rain or condensation obstructing the lenses), fear of breakage, and the glasses slipping down the nose.

Also, one third of presbyopes who usually wore multifocal spectacles (bifocals or varifocals) did not use this solution for their running-based sport. The blur of the ground from a reading add in multifocal lenses can increase the risk of falls in the elderly (Johnson *et al.*, 2007) and our surveys suggest this is also problematic for active presbyopes, with orienteers reporting this was a particular issue when running downhill, or on rough terrain where foot placement was more challenging.

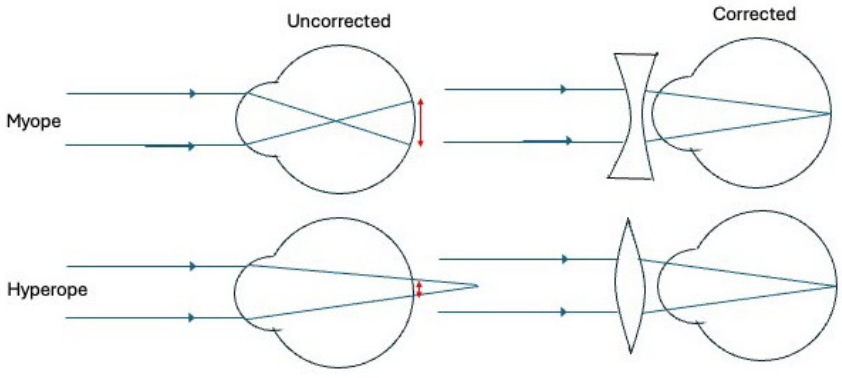
Action: Spectacles can be a successful option for recreational running sports. However, if someone is struggling with running in glasses, do signpost them to an ECP. Providing running-specific glasses with appropriate lens design, lens coatings, and frame fit can make all the difference.

CONTACT LENSES

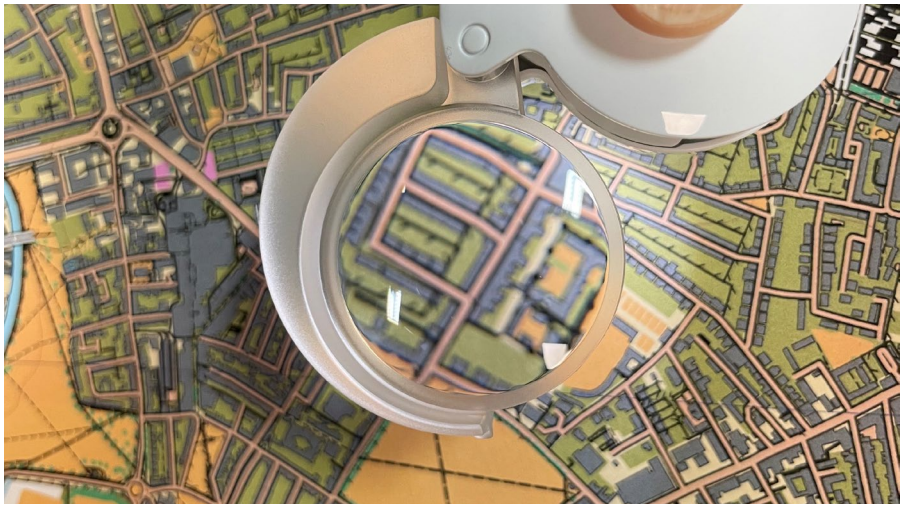
CL were a popular choice, being worn by 4 in 10 runners and orienteers. CL wearers in the running study were more likely to be younger and female. The key benefits of CL were avoiding issues with lens obstruction specifically and avoiding spectacles more generally.

Most presbyopic orienteers used contact lenses that provide different corrections for distance and near vision. The two main options here are multifocal CL that provide distance and near correction within the same lens, and monovision correction where one eye wears a lens for distance vision and the other a near vision lens. Older age and / or presbyopic correction is not a barrier to the use of CL, and sports and fitness are a key driver for older people to consider CL (Naroo *et al.*, 2022).

Action: The high prevalence of CL wear by runners and presbyopic orienteers highlights the benefits of CL for running-



▲ **Figure 1:** Myopes (top left) have an eye which is 'too strong': light rays are focussed (come to a point) in front of the retina, and the image on the retina is blurred (indicated by the red arrow). Negative lenses (top right) move the focal point back onto the retina. Hyperopes (bottom left) have an eye which is 'too weak'. Positive lenses (bottom right) move the focal point forward onto the retina – achieved either by providing a lens, or by a younger person using accommodative power in their own lens.
Figure courtesy: Kez Latham



▲ Credit - Kez Latham

related sports. Sports practitioners are encouraged to signpost clients to ECPs for professional fitting of CL, particularly male or older clients, who may not have thought of CL as a solution or may be unaware of presbyopic options. CL should always be fitted by a professional and never purchased online without prescription: not only is this illegal, but supply without tuition in appropriate hygiene increases the risk of sight-threatening infections (Carnt *et al.*, 2018).

RUNNING WITHOUT CORRECTION

Even though all runners had a visual correction and only 7% sometimes went without correction in daily life, a quarter (26%) sometimes ran without correction, including 15% who always did. Those running without correction generally had smaller refractive errors (low levels of hyperopia, or myopia up to -2D), suggesting the levels of blur experienced were not sufficient to warrant the perceived inconvenience of wearing correction, and this was particularly reported to be the case if a well-known route was being taken. Avoiding spectacle correction appears to be a particular driver to the decision to run without correction, as people were less likely to run without correction if they had CL available.

Some runners who reported running without correction had refractive errors (-2D to -3D) that would give vision that would be too blurred for driving legally and approaching the level of vision that would allow entry into visually impaired sport if it could not be improved. It's not yet known what level of blur can be tolerated before running performance is impaired, but it's hard to believe that running performance and environmental awareness would not be improved by correcting these significant levels of blur.

Action: If a client usually wears visual correction but runs without it, do discuss why and whether it may be affecting performance, and consider signposting to an ECP. They can discuss CL options with any runner who does not currently wear them, and/or address concern(s) with spectacles as outlined above.

NEAR VISION DETAIL

One of the key issues for the presbyopic orienteers, whether they used spectacles or contact lenses, was being able to read map detail (see image above). The maps can involve very small features that need to be read accurately and are often read in suboptimal conditions (while running, potentially in dark forest). While many of the orienteers who did not need a distance vision correction used orienteering-specific reading glasses that could be purchased without prescription, an ECP can explore an individual's specific needs and recommend optimal solution(s), particularly where both distance and near corrections are needed.

SUMMARY

As an extension to the usual health checks prior to commencing with a client/athlete, include questions about your client's vision and vision correction(s). Signpost clients needing advice to ECPs who can provide personalised task analysis of the visual needs of runners to prescribe successful vision correction solutions, including contact lenses and/or sport-specific spectacles. ■

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