

Contact lenses and sport in everyday practice

Many eye care professionals may not consider themselves as 'sports vision' practitioners, but the very fact they work for the general public by default makes them just that. Sports vision can be defined simply as looking after the vision needs of patients who play sports.

In fact sports vision consists of two levels. The first level involves working with recreational and competitive athletes in everyday practice. This requires the practitioner to take an accurate case history (including asking patients if they play sport and, if so, which sports and at what level), have strong optometric skills and the knowledge to recommend the best products and advice for patients. You will be surprised how many people coming into your practice are involved in some sporting activity (Table 1).

The second level of sports vision involves working with elite athletes and requires high-tech, expensive equipment and an extensive knowledge of binocular vision, visual perception and the neurological processing of visual information, as well as an approach which is entirely scientific and analytical.

At elite level, you need to have an understanding of the infrastructure of the coaching set-up and be able to integrate your work with that of the sports scientists, strength and conditioning coaches, as well as the physiotherapists and management team. To get the best results you also

Contact lenses have many advantages for sports participants at all levels and all ages, as **Gavin Rebello** reports



Uncorrected astigmatism can cause problems in fast ball games such as lacrosse, cricket and hockey

need to have a clear understanding of and ability to work with the psyche of the elite athlete.

Working with this group of clients requires additional training and experience which is beyond the scope of this article. To do so without the complete skills set puts at risk not only whether the athlete reaches peak performance but also your reputation.

We recommend you refer elite athletes to specialist sports vision practitioners, who will then hand back the athlete for you to manage their contact lenses and product sales.

Choosing the best option

Are contact lenses the best correction for sport?² In most cases, the simple answer is yes, although there may be

some debate with respect to water-based sports and special consideration needed for some activities which we will discuss later in this article.

With such an array of contact lens choices, patients should be given the opportunity to try contact lenses for their sport so that they can experience the many advantages this form of correction offers (Table 2).

Contact lenses used for sport need to deliver the following:

- Comfort – so they are not a distraction
- Clear, stable vision which meets the demands of the sport
- Adequate oxygen and tear exchange to protect the health of the eye.⁴

Additionally, your patients must be confident in their choice of correction, trusting that it will provide the vision they require without becoming dislodged or knocked out of place, and that the lenses are the best they could be wearing for their sports environment.

Previous articles have debated

TIP 1 Ask - and you'll improve your service

If you do not pro-actively ask all of your patients whether they play, like or are involved in sports (they may umpire or coach), then you cannot deliver great customer service, simply because you have no chance of giving appropriate advice to suit every aspect of that particular individual's needs

TIP 2 Don't assume, show an interest - and you'll build a loyal client base

Just because the majority of your patients are pensioners, doesn't mean they aren't involved in sport. In our practices we see significant numbers of 65+ golfers, tennis and table tennis players, swimmers, walkers, crown bowlers, cyclists, clay shooters and gym users who have benefited from a discussion about the merits of specific visual correction options for their sport

TABLE 1

How many of your patients are involved in sports?¹

Sport	Total (UK)
Swimming	>7 million
Racquet (tennis, squash, badminton)	6 million
Golf	4 million
Cycling (racing, road, commute)	6 million
Walking (power, hiking/rambling)	4 million



The author currently works with the GB Ladies Volleyball team. Pictured is Nicky Osborne

TABLE 2

Advantages of contact lens correction for sports

CL advantage	In sport this means:
Wider field of view	Better peripheral vision
Continued performance with player exertion	Avoids: Lenses steaming up Glasses slipping Sweat on spectacle lens
No magnification/minification effect	Better depth perception
Lens remains centred on eye (all gazes)	Less aberration Less prismatic shift in 'apparent' ball position
Maintenance of vision	VA/contrast sensitivity unaffected by: Lenses steaming up Dirt on spectacle lenses Rain drops Spray
No reflections	Sports hall lights, low sun distractions

whether soft lenses or gas-permeable lenses should be fitted, but with the advent of new soft contact lens technology this has become less of a discussion.⁴ Since the vast majority of prescriptions are now available in daily lens form, we suggest the use of daily disposable lenses as the first-choice option for vision correction for all sports, followed by monthly or two-weekly disposable soft lenses, and finally gas-permeable lenses (not an option for contact sports).

Some sports environments provide greater challenges to contact lens wear than others, and these include water sports, winter sports, shooting and contact sports such as rugby. The specific demands of each sport need to be taken into consideration.

Practitioners also need to consider hygiene, since many sports are played outdoors and changing room environments may not be ideal, increasing the risk of contact lens contamination and ocular infection.

Water-based sports

This is always a dilemma for practitioners because on the one hand we want to offer the most practical solution (which is not spectacles), yet we also have to manage the risk of lens loss, the risk to eye health through infection, and the possibility of lens adherence.⁵

The risk of lens loss is less than might be expected. Galkin and Semes⁶ studied contact lens-wearing waterskiers, and showed that in over 100 trials, of which 76 per cent resulted in the waterskier's head being fully submerged under the water, not one lens was lost.

With fast impact sports such as waterskiing, and other water sports, it may be that the blink reflex is protective and works to keep the lens in place. Sea water also has the effect of causing contact lenses to tighten slightly under exposure.

As a practitioner, you need to ensure that the lens remains in place even with a strong blink, but there is no need to be preoccupied with whether the lens will float off.

With regard to infection risk, Vesaluoma *et al*⁷ found high concentrations of *Staphylococcus*, *Pseudomonas* and amoeba in 41 per cent of Finnish swimming pools (and an even higher incidence in hot tubs). Chlorine in pools was not enough to protect the eye from these microbes.

Recent research has investigated the effect of wearing goggles over contact lenses during swimming. Wu *et al*⁸ showed that swimming goggles reduced the amount of bacterial colonies found on the lenses, although contamination was not reduced to zero.

Other correction options are

available such as prescription goggles, orthokeratology, refractive surgery, and potentially semi-scleral or scleral contact lenses. Prescription goggles are associated with the least amount of risk,³ but they are not always practical (think waterskiing, surfing, white-water kayaking) and your patient may not want to wear them. In water polo, goggles are forbidden entirely.

Orthokeratology is a good alternative to soft contact lens wear for water sport athletes, especially those who play water polo, but it does not work for all refractive errors. Refractive surgery is another option,⁹ but there are numerous other factors that must be considered when recommending this option to any patient, and especially to a sports patient, which are beyond the scope of this article.

Semi scleral and scleral contact lenses may prove to be another option, but with only a small percentage of the population wearing them, more research is needed before they can be actively recommended for sports vision patients.

Managing swimmers and other water sport athletes

Traditional advice has been to avoid wearing contact lenses for swimming, but it is important to recognise that patients still need clear vision in this situation. They need to be able to walk safely from the changing room to the pool (on a wet surface). They need to see where other people are, again for safety reasons. And they may be supervising their children.

The vision may not need to be corrected to 6/6, but the correction



Swimming goggles limit but do not eliminate bacterial contamination on contact lenses



does need to allow functional vision for patients, and they need to feel they can see everything they want to see.

The safest, and your best defensive practice, is to advise prescription swimming goggles. For the majority of swimmers this provides a practical and cost-effective way of ensuring clear vision and low risk to the eyes. Ortho-K or daily disposable contact lenses with tight-fitting goggles are alternatives.

Current BCLA advice is to avoid wearing contact lenses for swimming unless using goggles (or wear single-use lenses and discard them after swimming).¹⁰

For goggle-unfriendly sports such as waterskiing and surfing, it is my belief that if you offer patients clear, coherent, reasoned advice, then they are more likely to follow your instructions than if you give advice that they deem impractical or unrealistic given their perceived risks. There are countless web forums where athletes are advising other athletes that they have no problems with wearing contacts when playing water-based sports.

If ortho-K is not an option, we suggest a strict routine as detailed in the panel (right) as a suggested compromise, but note it is a compromise and you must flag up the increased risk of microbial keratitis when wearing contact lenses in water. Many practitioners will feel uncomfortable with taking responsibility for this regime and, where this is the case, should not practise in this way.

That is the big challenge of sports vision where we manage the athlete's sports performance and eye safety, not just the eye. We urge the research departments to look at the infection risk to the contact lens-wearing eye in sports such as surfing etc where goggles are not worn. Research is also needed into risks with different modes of contact lens correction and care strategies in swimming and other water sports.

There will be times (clinical or financial) when a patient cannot wear the same daily disposable lenses for everyday life that he/she wears for sport. For example, some patients may prefer monthly lenses every day for financial reasons and use their daily disposable lenses only for their water-based sport. This arrangement is often reached after your patient has asked why they can't use their monthly lenses in the water.

As a practitioner, you need to spend

ADVICE FOR CONTACT LENS-WEARING WATER SPORT ATHLETES (IF GOGGLES NOT POSSIBLE)

If you wear your lenses for water sports, stick to a strict routine:

- Use daily disposable lenses
- Use CL rewetting drops to stabilise the CL parameters on finishing water-based activity
- Wait a few minutes (to avoid epithelial loss if lens adhered)
- Remove and 'dispose of' lens - *(Specifically highlight 'dispose of lens' - this may sound obvious but some patients may think it is acceptable to reuse lenses as they have only been worn for a short period)*
- Have a minimum 30-minute 'recovery' period in spectacles post activity
- Self-check for signs and symptoms of infection and report to practitioner if concerned - in these circumstances do not put new contacts in
- If all clear, use a fresh pair of contact lenses or remain in spectacles

Notes for practitioner:

- You must make a note on the record card of the advice given
- You should provide written instructions to your patient of the signs/symptoms and action required with regard to eye infection and contact lenses

time discussing the risks of water-based sports and the reasons behind your recommendation with your patient. It often helps to remind them that they have special equipment for their sports (who wears a wet suit to the office?), and the daily disposable contact lenses you are recommending are just another specific piece of equipment for their sport.

Winter sports

In winter and other high-altitude sports, UV exposure and atmospheric dryness are significant concerns. Snow reflects almost 80 per cent of UV light, and UV exposure increases approximately 4 per cent for every 300m increase in altitude.

Under these conditions, UV-blocking contact lenses do not provide sufficient protection for the

eye and the adnexa. Patients need to wear UV-blocking wraparound sunglasses or goggles, and a suncream may be also advisable.

It is imperative you also advise your winter sport athletes that UV-blocking contact lenses are not a panacea. They will not protect the eyelids (a site for aggressive basal-cell carcinoma), conjunctiva or other tissues in the orbit from UV. Additional UV protection must be used.

The relative humidity in winter tends to be lower than in the summer months. This is further exacerbated by the use of heating systems in vehicles and buildings, and by the high speed which some winter sport athletes move at (downhill skiers can reach speeds upwards of 60-80mph).

Non-preserved artificial tear drops are an ideal way to combat contact lens dryness in winter sports. They are widely available and should be recommended to all winter sport athletes. Additionally, wearing protective sunglasses, goggles or a helmet face shield will help minimise the effects of wind and speed on the drying of the contact lens.

Summer sports

UV exposure is an important consideration in summer sports as well, and should be managed as discussed previously. Spring and summer sport athletes, like many contact lens wearers, suffer from hayfever. In the past, many practitioners have shied away from prescribing contact lenses for hayfever sufferers. However, in many cases daily disposable lenses provide a helpful barrier, as shown by Stiegemeier *et al.*¹¹

Special considerations

Other sports such as shooting may require special considerations. The disadvantages of contact lenses for target shooters and clay can be:

- Reduced stability of vision (may notice lens movement)
- Reduced blink rate with concentration – causing tear-related vision and comfort issues.

While many athletes shoot successfully wearing contact lenses, you should be prepared to change tack and offer an appropriate shooting lens if contact lenses are not delivering the quality of vision demanded by this exacting group of athletes.

Our practice has a wide range experience working with elite



The author pictured with top British skier Chemmy Alcott



TIP 3 It's all in the planning

Suggest your patient hands a set of spare lenses and re-wetting drops to their coach or keeps them close to hand on the sidelines

TIP 4 Don't forget the tear film

The tear film is essential for successful contact lens wear, especially in sport.¹² You will significantly reduce your drop-out rate by being mindful of the impact that the tear film has on comfort and vision

TIP 5 Think of the person not just the eyes

As vision experts, it is our responsibility to make sure we do not needlessly present a barrier to any patient reaching their potential

TIP 6 Get confident fitting CLs to children

Fitting youngsters with contact lenses can be good for the patient, and good for your practice in that it increases sales and develops patient loyalty

TIP 7 Small things make big differences in sports

Small cylinders (0.75D and greater) need to be corrected in patients who play sports. Start with the spectacle astigmatism axis, let the lens settle, check its alignment and stability in all gazes, particularly primary gaze for that sport, and make adjustments if need be

athletes, yet we refer our elite shooting athletes to Ed Lyons of Flint and Partners, Wolverhampton, who we believe has the best record of successful management of shooters' vision in Europe.

Children and sport

Sport is essential for the well-being of a child. It teaches them many things including working within a team, dealing with success and failure, and the reality of a competitive world. Sport is also an essential ingredient for the long-term physical fitness of the child.

In our sports vision clinic, we have seen numerous cases where children have almost given up competing at a high level of sport (county or national) simply because their myopia did not allow them to see the ball well enough, and their practitioner had not discussed contact lenses as an option.

Evans¹³ suggests high oxygen, daily disposable lenses are the first-choice lens type for children to wear. They



Contact lenses can help myopic youngsters to continue playing sport at a high level

learn quickly and are more likely to follow your instructions than many adults.

We specifically fit contact lenses to children on a part-time (sport) schedule so that they remain comfortable wearing spectacles. Make sure you schedule regular follow-ups and your practice management systems can keep track of those who fail to attend.

Correcting small errors

In sport, small cylinder corrections (and small amounts of anisometropia) make a difference, especially if there is more impact to the dominant eye. Uncorrected astigmatism can cause problems with sports hall lights, floodlights and problems tracking small fast balls such as in lacrosse, cricket and hockey. Long gone are the days of thick soft lenses that could mask small amounts of astigmatism.

Eye protection

The greatest disadvantage of contact lenses for sports use is that they offer limited eye protection from fingers, stray squash balls, etc. It is imperative that you remember to advise your sports patients about the appropriate protective eyewear for their sport. You have a responsibility to your patients to do this, and your advice needs to be noted on the patient's records.^{14,15,16}

In summary, contact lenses are an ideal way to start building your sports vision practice. Your patients will thank you, your business will thank you, and interacting with the patient

about their passions means that you will enjoy your job more too. ●

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