Sports vision speakers, and outgoing BCLA president Shelly Bansal, pictured with the women's GB Volleyball team

A sporting chance

The BCLA Clinical Conference marked this Olympic year with a special session on contact lenses and sport. Could harnessing interest in sports and vision help grow the contact lens market? **Alison Ewbank** reports

When goalkeeper Petr Cech saved three out of six penalties to help Chelsea win the 2012 Champions League, correctly predicting the direction of all six, there was one fan in particular who showed little surprise.

For many years **Michel Guillon** has worked with the Chelsea team and its coaches on 'science-based vision management'. With Cech, he developed a Penalty Programme using visual cues, reaction times and statistical analysis to enhance key visual functions in goalkeeping and optimise vision.

As Guillon told delegates at a special session on sports vision at the British Contact Lens Association conference, the strategy worked. Cech had recorded the fastest reaction times of any player he had seen.

Guillon also revealed that the Czech-born goalkeeper is a long-term contact lens wearer (and has never lost a lens).

Benefits at all levels

Specialised sports vision is relatively new to the UK and is evolving into a more evidence-based discipline. While training elite athletes like Cech requires a high level of knowledge and commitment, the benefits of contact lenses for all sports participants are obvious.

Guillon identified distinct levels of sports vision involvement. The initial stages – screening for visual and ocular defects, and correcting any refractive or binocular anomalies – could be carried out in everyday practice.

Truly specialised sports vision, which began once these initial stages were completed, required specialist instrumentation, programmes customised to the individual not just to the sport, and systematic data collection. The eye care practitioner must also be an integral part of the coaching team, he said.

Optometrist **Martin Lloyd** has also worked with athletes competing at a high level, from British Winter Olympians and the GB hockey team, to junior tennis and rugby players. Lloyd's advice was to look out for small uncorrected cyls and undetected binocular vision problems. Vision testing and correction in athletes must be very precise, he said. While it was important to recognise the limitations of sports vision, many participants could benefit whether elite athletes or not.

Guillon's colleague **Kristine Dalton** reviewed factors affecting contact lenses in winter sports, a topic rarely discussed and one where advice could be improved. These sports might be indoor, such as skating and ice hockey, as well as outdoor, from cross-country skiing to bobsleigh.

Tear film quality could be affected at very low temperatures and ocular lubricants were needed in low humidity conditions. High UV exposure, especially at altitude, carried a risk of photokeratitis so UV-blocking contact lenses and wraparound sunglasses should be worn. Sports such as downhill skiing and speed skating required goggles or a face shield to reduce air flow since dryness could be exacerbated at high speed.

Martin Cardall's Irving Fatt Memorial Lecture looked at the effects of exercise on the cornea and contact lens wear. Cardall had tested ocular surface temperature with three lens types before and after exercise. Contact

Dr Michel Guillon works with Chelsea goalkeeper Petr Cech to optimise vision

lens material appeared to influence surface temperature during exercise, a silicone hydrogel lens producing less change.

Cardall noted that, after cosmesis, sport was the primary reason for patients requesting contact lenses. Yet more than half of patients surveyed said they were not asked at their last eye test whether they played sport, nor questioned on which sport and at what level they participated.

Research also showed that just over half of contact lens users reported wearing their lenses for swimming and only a third of these used goggles, although wearing goggles has been shown to reduce bacterial contamination of lenses when swimming.

The consensus from this session was that contact lenses for sport could be a practice builder and might even help increase the penetration of contact lens wear in the UK. What was needed was an evidence-based approach to providing advice on appropriate eye correction and protection in sport.

Picking the winners

Novel contact lens applications also have the potential to bring new benefits to more wearers, according to speakers at this year's conference. Opportunities for fitting more young patients were especially highlighted, given the current interest in myopia control.

Although claims for the treatment effect of various interventions to control myopia progression in children vary, consensus is now emerging on some strategies. The focus is turning to how these strategies might work in practice and ways of communicating them to parents and children.

Padmaja Sankaridurg is program director at the Brien Holden Vision Institute (BHVI), Sydney, which is trialling novel spectacle and contact lens designs for controlling myopia in collaboration with colleagues in China, where some anti-myopia lenses are already commercially available. Sankaridurg offered her advice on 'picking the winners'.

Patient factors involved in myopic progression included age, gender, ethnicity and parental myopia. Young children progressed much faster than older children so examinations should start at 6-7 years or younger. Girls progressed slightly more than boys and Asian eyes much faster than Caucasian eyes. If both parents were myopic, progression tended to be greater, she said.

So far, contact lens approaches showed better potential for myopia control than spectacles, with treatment effects currently around the 30-40 per cent level.

Martin Lloyd observed that, unlike other tennis players, Roger Federer and Rafael Nadal fixate the contact zone of the racket when hitting the ball

Among the most effective interventions was increasing the time children spent outdoors. Myopic progression was 30-70 per cent slower in summer months than winter months and there was a 2-3X increased risk of having more myopic refraction with low outdoor activity. The benefit was small with one hour's activity per day but might be greater with more hours spent outdoors.

Sankaridurg argued that since under-correction of myopia accelerated myopic progression, children needed to be examined frequently to ensure they were fully corrected. Progressive addition spectacle lenses had a small but significant effect on myopic progression. Anti-myopia spectacles only showed a significant effect at one year (for one of three lens types tested) in younger children whose parents were myopic.

Anti-myopia contact lenses showed more promise since the lens aligned with the eye (36 per cent effect at one year). The latest orthoK results demonstrated an average treatment effect (over five years) of 30 per cent. Simultaneous defocus soft bifocal lenses showed similar levels.

Of the pharmaceutical interventions, low-dose atropine (0.01 per cent) had a significant effect and might avoid the side-effects associated with this type of approach.

In his own presentation on 'what works today, use it now', **Brien Holden** had this observation: 'We're being a little unfair on practitioners in this discussion on myopia control because there is not a recognised and developed programme or system that anyone has yet been producing for distribution through educational programmes and professional development.'

But there was 'galloping evidence' that it made sense to do something about children who were myopic and were becoming more myopic, said Holden. Nearly one in three became myopic after the age of 17, so this was not only about young children, he added.

Myopia management in practice

At Australian optometrist **Kate Johnson**'s practice in Brisbane, myopia control is already a reality. Although her presentation focused mainly on orthoK, she had some useful advice on setting a strategy for introducing myopia management into practice and communicating the benefits.

Her own strategy was to start myopia management in children early, at -1D or less, to achieve a more clinically meaningful effect. OrthoK and soft bifocals currently had the most consistent anti-myopia effect, she said. OrthoK appealed to parents since the child wore no lenses during the day, while soft bifocals had fewer limitations in terms of pre-treatment refraction, or for flatter Ks and East Asian lids.

Practitioners needed to understand the risk factors for myopia, understand binocular vision and peripheral defocus, and understand how each of the options worked. Importantly, practitioners should communicate the benefits realistically, and prepare written materials and verbal explanations to help discuss the various options.

The decision to instigate anti-myopia treatment should be based on hyperopia of +0.50D or less at the age of eight, parental myopia and binocular vision status, she said.

Although many in the audience were already using myopia control contact lens interventions in their practices, others were cautious about recommending treatments or making claims based on current results. Opinions might change were a branded product, with the industry support that would entail, to be commercially available and marketed in Europe.

Opportunities for young wearers

Myopia control is not the only reason for fitting contact lenses to young wearers as speakers in another conference session highlighted.

Communication specialist **Sarah Morgan** said that concern about

appearance started at a very early age and spectacle wearers were more at risk of bullying than other children. Contact lenses had many quality of life and convenience benefits for young people.

These observations were confirmed in a study by **Debbie Jones** and co-workers at the University of Waterloo involving children aged 8-16 years. Quality of life scores were higher with contact lenses than with spectacles and the experience was positive for both child and parent. Practitioners should routinely offer contact lenses to children from an early age, said Jones.

Bruce Evans of the Institute of Optometry reviewed cases where contact lenses were the preferred option, such as for orthoptic indications, anisometropia or amblyopia.

Australian researcher **Carol Lakkis** observed that practitioners might be hesitant to fit children because of concerns about safety and compliance. They might perceive children as harder to fit or question their motivation and maturity. Cost might also be an issue. But most common adverse events were minor and were more likely to affect the 16+ age group rather than younger children. Compliance was also similar in adults to children.

For optometrist **Simon Donne**, fitting young wearers with contact lenses could be more profitable than spectacles. Sport was the 'number one driver' in children up to 17 years and the primary reason practitioners recommended them to teens.

Surface and comfort

If opinions are divided on the current status of myopia control, there is no doubting the current focus on improving comfort for all contact lens wearers. The Tear Film and Ocular Surface Society is launching an international workshop on this issue (http://www.tearfilm.org/tfoscldreport/index.htm), following on from similar dry eye and meibomian gland dysfunction workshops.

Studies into the relationship between the ocular surface, the contact lens surface and patient comfort were a common theme at the conference.

Fiona Stapleton described a study at the University of New South Wales examining which characteristics of the ocular surface distinguished normal and marginally dry eyes. The study assessed tear osmolarity and volume, non-invasive tear breakup time, corneal and conjunctival staining and sensitivity, and lid wiper epitheliopathy (LWE) in contact lens wearers and non-wearers. Subjects also completed surveys into ocular comfort, dry eye symptoms and impact on quality of life.

Brien Holden: myopia control not only about young children

Tear osmolarity was a key marker of ocular surface health even in normal and sub-clinical dry eyes. Ocular surface sensitivity was associated with symptoms but not signs, while LWE and conjunctival staining were closely related to both signs and symptoms. These factors helped categorise the role of sensory function in marginal dry eye, said Stapleton.

Soft lens wearers are known to experience reduced comfort for the last two hours of the day. **Nancy Keir** described a new cumulative comfort (CC) score, which takes into account wearing time. In a University of Waterloo study, wearers symptomatic for end of day comfort wore three daily disposable lens types, each for three days with at least a one-day washout between. On Day 2, subjects rated comfort at four-hour intervals and/or prior to lens removal.

CC was calculated for hours worn times comfort rating at each visit added together. This score provided different information from mean comfort ratings, said Keir, and end-of-day ratings alone did not account for those who might respond to poor comfort by removing lenses earlier than desired.

Asking patients whether they removed their lenses early, as well as the time of insertion and removal, was a simple measure to apply in practice.

Keir's colleague **Kathryn Dumbleton** conducted an unusual study on soft lens replacement with surprising results. The study involved soft lens wearers, mainly using monthly replacement lenses, who reported reduced comfort with lens age, and wearers with no symptoms on lens ageing.

In the first part of the study, lenses were replaced at day 28 without the subjects knowing and in the second part lenses were not replaced. Masked replacement had no effect on comfort or vision at day 29 in either symptomatic or asymptomatic group.

Dumbleton concluded that behavioural expectations might be a factor in clinical trials and observed that a third cycle, in which subjects were told their lenses were being replaced but were not, might produce interesting results.

Information and contact lenses

Improving communication is often the default message suggested as the panacea for solving intractable problems but several speakers had practical ideas for informing patients that might actually work.

Kathrine Osborn Lorenz (Jacksonville, Florida) described an astigmatic demonstrator with rotatable +0.25DC/-0.75DC lenses that could be used to demonstrate the effect of correcting low amounts of astigmatism to patients and upgrade low astigmats from spheres to toric contact lenses.

Her colleague **Janelle Routhier** found that electronic reminder systems could aid contact lens replacement, increasing compliance from 40 per cent to 77 per cent. Email reminders were the most popular reminder method.

Rachael Peterson examined whether perception of quality of life impacted comfort scores in contact lens wearer trials. Perceptions of physiological changes were complex and highly subjective, involving factors such as sensitivity, tolerance, personality traits and wellbeing.

Extroverted patients were more likely to voice complaints about comfort and it was important to recognise introverts and encourage comment. Try asking same question two ways to elicit response, advised Peterson.

Meredith Jansen and co-workers at Indiana University looked at whether email surveys were effective for monitoring patient response in real time. Subjects were sent nightly emails to their smart phones at 8pm with a link to a 25-question survey on lens performance at night.

A remarkable 95 per cent of nearly 700 surveys were completed and of these less than 4 per cent were completed late. The highest completion rate was on Sundays and those aged 23 and over more likely to complete. This is one research tool that should probably come with a warning along the lines of 'don't try this at home'.

● More news from the conference in August Contact Lens Monthly.