

ROUNDTABLE



Putting the skill back into soft lens fitting

Has the one-size-fits-all philosophy led to an over-simplification of soft contact lens fitting? As it celebrates its 20th anniversary, mark'ennovy convened a European roundtable meeting in Madrid to find some answers

The next time you reach for a diagnostic bank to select a contact lens for your patient, consider this: with more than 14 billion eyes on the planet – each one unique – is it likely that one size of soft lens can really fit all?

This was the question posed by mark'ennovy, a company founded 20 years ago this year that delivers a combination of soft lens parameters, geometries and materials to enhance patients' experience of contact lenses.

A roundtable meeting at the company's Madrid base brought together European practitioners, researchers and educators to consider one of the key challenges facing the profession: how to put expertise back into contact lens fitting. Presentations from three panel members set the scene for some lively discussion.

'SUPER SIMPLE'

Eef van der Worp began by pointing to a new phenomenon: the online contact lens test. He points out one supplier in

PANEL MEMBERS

- **Dr Eef van der Worp**, Maastricht University, Maastricht, Netherlands
- **Dr Giancarlo Montani**, Università del Salento, Lecce, Italy
- **Professor James Wolffsohn**, Aston University, Birmingham, UK
- **Gillian Bruce**, Cameron Optometry, Edinburgh, UK
- **Elena García Rubio**, Instituto Nacional de Optometría, Madrid, Spain
- **Professor Christian Kempgens**, Beuth Hochschule für Technik, Berlin, Germany
- **Dr Patricia Wagrez**, Ophtalmologue Lesneven, Brest, France

particular. 'In just five minutes, you can take our vision test [on your iPhone] and re-order your contacts, all without the office visit,' says simplecontacts.com, which charges \$10 per test. 'Getting your contacts just got super simple,' it states.

But are eye care practitioners also in danger of making soft lenses a commodity? Can we really justify our fees if we are relying on the patient to say whether their lenses are

acceptable, rather than evaluating properly whether the lenses fit?

Soft lens fitting as a science and as a skill had been downplayed over the past two decades or so, said van der Worp. How could we put arguments to regulators against developments such as simplecontacts.com? And how could practitioners counter this new challenge?

According to **Gillian Bruce**, online testing could be a threat to some practices but, other than for 'run of the mill' orders, people would ultimately find that it was not working. 'We try to make ourselves a little bit different and make it transparent that they're paying for the care not just for contact lenses,' she said.

James Wolffsohn agreed contact lenses were treated as a commodity. 'Not only have we de-skilled contact lens fitting, we've also taken the interest out of it,' he observed. 'It's gone from a proper hands-on skill to the point of just putting a lens on the eye and seeing whether it works.'

For van der Worp, there were many factors related to dropout and comfort over which practitioners had no say. 'But what we do have control over is the lens fit. Currently, we're trying to find eyes that best conform to our limited arsenal of soft lenses available.'

'The goal is to turn that around, to measure the eye in detail, and to find or design the best possible lens shape for that eye. That could make a difference,' he said.

BEYOND BASE CURVE

There was general agreement that lens design should not be defined by a single number on the lens box. Base curve was only a symbolic or average value, one lens could not be compared with another of the same nominal value, and different base curves did not produce predictable or systematic differences on the eye.

'Base curve is just a starting point,' argued **Elena García Rubio**, who chose a lens by looking at base curve and diameter. Bruce agreed: 'In the past we've only had base curves and K readings – as we were taught at university – and that was due to a lack of other information about the lens or eye shape.' But research showed there was no relationship between central Ks and the behaviour of a soft lens on the eye.

Elevation, sagittal height and tangent angles seemed to be becoming the new standard in soft lens fitting, said van der Worp. The average sagittal height of the ocular surface from a clinical perspective could be assumed to be 3,750 microns for a



Panel members James Wolffsohn, Patricia Wagrez and Gillian Bruce

normal eye over a 15mm horizontal chord, with a 900 micron range.

The sag height of a soft lens needed to be higher than that of the ocular surface – by around 130 microns on average, although dependent on the lens – to generate 'grip' for an acceptable fit. While substantial differences in sag height existed between different lenses, the total range of the lenses available was limited.

Sag height also had limitations, said **Christian Kempgens**. 'It's not a very precise parameter either but it's the best single, composite parameter we have. I'm not sure we can completely throw away base curve. What happens from the centre to the periphery – the back surface design – is also a determinant of fit,' he warned.

Along with material properties, edge design and mid-peripheral thickness were at least as important to lens fit as base curve. The problem was that practitioners usually did not know what lens design they were fitting. Often the geometry of the lens was just described as back surface 'spherical' or 'aspheric'.

IMPROVING FITTING

Van der Worp summed up his wish list: 'What I want is an instrument that at least tells me whether it's a normal eye – if I know that I can fit a standard lens. It's time to look again at parameters – sag may be of added value. But whether we use base curve, diameter or sag height, we can only fit so many eyes.' He estimated about one in four eyes would fall outside the range of soft lens sags currently available as standard.

Soft lens fittings could be categorised into stock or standard 'off the rack' lenses for the centre of the bell-curve of average eyes, out of standard lenses that had fixed geometry but were available in a range of base curves and diameters, and true custom-made lenses that were individually made for a particular eye and had few limits to shape, power, design or material.

With stock lenses, corneal topographers could be helpful in predicting the overall height or shape of the eye but there was little more that could be done to improve fitting. Going from a spherical stock lens to a toric of the same brand could radically change the fit.

Aside from standard lenses, in the absence of sag information it was better to change lens diameter than base curve to influence lens fit. A variety of methods were used for measuring iris diameter: **Giancarlo Montani** used a photographic system to record horizontal, vertical and



Eef van der Worp: The science and skill of soft contact lens fitting has been downplayed

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In discussion: Elena García Rubio, Giancarlo Montani and Christian Kempgens

oblique iris diameters and García Rubio used an autorefractor. Others simply measured HVID in mm with a ruler.

'If we want to take this seriously, we should use a standard method, measure to 0.1mm and in the oblique meridian,' said van der Worp. From studies of HVID measurements, 27% of eyes would benefit from a small or large diameter lens.

With custom-made lenses, a true 'tailored fit' could accommodate the shape and patterns of the ocular surface. But practitioners had to be able to measure the eye accurately over the area covered by a soft contact lens, and should also talk to the patient about the tangible benefits of this approach, whether in terms of comfort or long-term health.

Finding a better standard lens for a given eye, having a range of lens fits to trial, or creating customised contact lenses might prove to be instrumental not only in the future of soft lens fitting but the future of our profession as well, he said.

BACK TO FIRST PRINCIPLES

Changing attitudes would not be easy. 'For years, industry has told practitioners "we're making it easy for you",' said García Rubio. 'Now we need to go back and work from first principles. It's going to be a tough job to get that message across.'

But for Montani, now was the time for a different approach to soft lens fitting. 'The relationship between the lens material and the tear film is considered the most important cause of discomfort and dropout. That's not surprising because every year we hear something new about materials with better performance. But dropout could be related to poor fitting.'

'We need to go back and consider the relationship between the lens and anterior segment, and the movement and centration of lens fitted. For example, with more complex optics – such as multifocals, where centration is critical – we may need to fit lenses differently or they won't work well.'

Education was also an issue, said Patricia Wagrez. 'In France we don't think like that. Contact lenses are a very small part of our studies and most practitioners don't consider corneal shape when fitting soft lenses. Having a corneal topographer helps me understand that more.'

Bruce added that patients needed to be educated too: 'Explain to patients why you're choosing a particular lens and they will be prepared to pay for it.'

PREDICTING COMFORT

If lens fit is difficult to predict with current stock lenses, what about comfort? Montani opened the next session by examining the factors that influence soft lens comfort, with reference to

the 2013 TFOS International Workshop on Contact Lens Discomfort.

Panel members used a variety of methods to assess and record comfort. In her practice, Bruce paid attention to history, symptoms and objective signs. Wolffsohn used the CLDEQ-8 questionnaire in studies but taught his students to rate lens comfort on a 0-10 scale and ask about comfortable wearing time.

Montani suggested a simple three-question approach to cover wearing time, and intensity and frequency of discomfort. The nature of the discomfort – dryness, burning, irritation – could also be recorded.

Studies with concurrent controls and masking were not able to show a difference in comfort between hydrogel and silicone hydrogel (SiHy) materials. Both types were needed to deliver individual properties and meet patients' specific requirements.

Among material properties, modulus was important to lens fit and was a factor to consider when comparing lenses, but there was no definitive answer on whether reducing modulus improved comfort, said Montani. Different materials fitted differently on the eye. And when changing to a lens with different modulus, hydration properties or manufacturing method, different parameters might be needed to achieve the same fit.

Traditionally, high water content hydrogels were associated with more dryness symptoms, although with new materials this was no longer valid. With SiHys, no studies had systematically evaluated the impact of water content alone on comfort. 'We may need to consider hydration and fit over time. We don't have a number to help us understand why one lens loses less water over a day's wear than another,' he said. Neither was on-eye wettability a reliable indicator of lens comfort.

One material property held more promise. 'We now think that friction is part of the solution to increase comfort,' said Montani. Lenses with a lower coefficient of friction might be associated with better end of day comfort or comfort after two hours of wear. Edge design also influenced ocular health although the clinical significance was unclear.

The consensus was that practitioners should have a toolbox of options available, with a range of materials and parameters, and a variety of different properties, to meet their patients' individual needs.

Giancarlo Montani: Different materials fit differently on the eye





James Wolffsohn: Recording 'fit good' tells us nothing

SIMPLIFIED PROCESS

Discussion then turned again to lens fit and how simple a diagnostic fitting set for stock lenses could be used to optimise time spent on fitting while still covering as many eyes as possible.

For Wolffsohn, provided a 'glove fit' were not required, four diameters and three sags – 12 combinations – would be sufficient to cover adult and young children's eyes, or nine combinations for adults. 'Measure HVID, add 2mm to select the appropriate diameter, fit the middle sag and, depending on what you find, go up or down to achieve an optimal fit,' he said.

But many more combinations were required to fit all eye shapes and prescriptions. Mark'ennoy currently offers 86 combinations of base curve and diameter in a typical range, but as many as 1.4 billion individual lens options if all possible parameters, geometries and materials are included.

Research showed that, to classify lens fit, rating movement on blink in upgaze, horizontal lag and recovery on push-up test, each on a three-point scale, was most useful, said Wolffsohn. 'It's better to tie it down to just three measures and make sure they're recorded. Recording "fit good" tells us nothing,' he added.

FROM EARLY TO OLDER

Wolffsohn led the final discussion session, on the challenges of fitting younger and older patients with contact lenses.

Prescribing rates for infants, children and teens were low, although studies had shown that young wearers could be fitted successfully, with good compliance, few interruptions to wear, low complication rates and improved self-perception. Concern about rising levels of myopia was leading to intense interest in paediatric fitting.

Practitioners now considered orthokeratology and time spent outdoors as the most effective myopia control strategies. But branded myopia control soft lenses would soon be available. A change in mind set was needed if practitioners were to fit more children with contact lenses, and early enough for treatment to be effective.

'This year could be a game-changer in myopia control,' said van der Worp. 'In the Netherlands the focus is on using atropine but contact lenses will follow. We're going to start doing that now.' Montani pointed to the need to raise

KEY MESSAGES

- The fitting process has been over simplified, almost to 'one-size-fits-all', and studies show that this approach cannot meet the needs of all your patients.
- Better standard lenses, extended parameter lenses and customised soft lenses may prove instrumental for the future of soft lens fitting.
- K readings, in isolation, are not helpful when selecting lens parameters.
- Base curves are only symbolic values – sag heights would be more useful to understand soft lens fitting and behaviour on-eye.
- Material properties can influence soft lens fit.
- A range of materials – hydrogel and SiHy – and properties is required.
- Small eye size is a consideration when fitting very young children.
- Individually designed multifocals and toric multifocals are available.
- We need to start thinking differently about the way we fit soft lenses.

awareness and prepare the market for myopia control. Bruce's practice had surveyed parents on whether they were aware children could wear contact lenses, to begin the education process.

García Rubio, who specialises in paediatric fitting, had a useful tip. She wrote to the child's teacher as well as the doctor when contact lenses had been fitted, and also supplied the teacher with a lens case and solution should problems arise at school.

Eye size is among the key considerations when fitting very young children with soft lenses. The mark'ennoy range includes 11 diameters, down to 11.50mm, to fit smaller eyes.

PRESBYOPIC OPTIONS

At the other end of the age spectrum, drop-off in contact lens wear occurs earlier than the usual onset of presbyopia so should we be targeting patients earlier – in their mid to late 30s – with presbyopic options, as well as fitting more multifocals?

Presbyopes also have special considerations when fitting with contact lenses. Centration, pupil size, ageing ocular optics, and issues with ocular comfort and physiology, all have to be taken into account.

Standard multifocals generally performed similarly and we are still not good at predicting which design would work best, said Wolffsohn. 'In multifocal intraocular lenses, we have a very large range of designs of different types – multifocal contact lens design could be more inventive,' he argued.

So what was the secret of a good multifocal fitting? For Kempgens, the beauty of individually designed multifocal lenses was that he could maximise or minimise the diameter of the central zones, optimising the zone for the dominant eye for distance and non-dominant eye for reading.

García Rubio went for whatever option allowed the presbyope to be happy and see 'well enough', as did Wagrez. 'The biggest issue right now is toric multifocals,' said van der Worp. 'If we could fit these successfully, that would be a big help.' Kempgens' advice was to fit a toric first then, once the lens was stable, try a toric multifocal. Mark'ennoy is one of the very few companies that supply these lenses.

The discussion ended with a call to 'stop and think' before reaching for the same fitting bank for each patient, to rethink your fitting philosophy and to consider all the lens options available. Who would disagree with García Rubio's assessment of this thought-provoking discussion: 'The meeting was a real mind-shaker,' she said. ○