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## What influences comfort and contact lens wear?

This year's BCLA conference offered a timely reminder of the ongoing investigation by TFOS into factors influencing comfort and contact lens wear

Posted by [Mike Hale](#) on 5 September 2014 in [Contact Lenses](#), [Feature](#), [News & Features](#)

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*Professor Eric Papas chaired a stellar cast*

Last year, the Tear Film and Ocular Surface Society (TFOS) published the findings from a workshop comprising internationally recognised experts assembled to look at the published research relating to ocular comfort and contact lens wear. In a special session at this year's BCLA, key members of the various sections of the TFOS workshop presented their findings and recommendations. The session was led by Professor Eric Papas who, after a brief explanation of the TFOS aim, introduced representatives of each of the various sub-committees of the workshop, allowing them to briefly explain their findings concerning

contact lens discomfort (CLD).

### **CLD definition and classification**

Professor Brien Holden explained how a lack of clarity and consistency in the terminology relating to CLD had somewhat muddled the various findings of research aimed at helping improve the situation. This makes comparison of data and inter-study interpretation difficult. As such, the sub-committee had decided upon the following definition of CLD: 'Contact lens discomfort is a condition characterised by episodic or persistent adverse ocular sensations related to lens wear, either with or without visual disturbance, resulting from reduced compatibility between the contact lens and the ocular environment, which can lead to decreased wearing time and discontinuation of contact lens wear.'

### **Epidemiology of CLD**

Dr Kathy Dumbleton explained how studies have reported that between 12 and 51 per cent of lens wearers 'drop out' and it appears that CLD might be the primary reason for discontinuation. Being precise about epidemiology is problematic as there is little consistency in methodology and interpretation.

### **Contact lens materials, design and care**

Professor Lyndon Jones explained how the most significant impact on comfort is likely to involve length of wearing, replacement frequency, coefficient of friction and oxygen transmissibility. However: 'Problems with study design, lack of rigour, lack of coherent definitions and an inability to hold the design constant when testing an attribute make interpretation and any definitive conclusions very difficult indeed.'

Possible associations might include higher water content, higher modulus, poorer wettability, looser fit, increased thickness, and increased levels of deposition. Factors which, as yet, are still unknown and unproven as to their impact include wear modality, length of wear time, ionicity, nature of tear exchange and care systems.

### **Neurobiology of discomfort and pain**

Professor Mark Willcox explained how the interaction of a contact lens involves some of the most richly innervated surfaces in the body and so a degree of sensation beyond that related to most other interactions is not a surprise. Having said this, the complexity of the interactions are not fully understood and there is a need for more research. 'An important first step would be to design experiments to determine which tissue (such as corneal or lid margin) is the primary sensory location of CLD.'

### **Interactions with the ocular surface and adnexa**

Professor Nathan Efron suggested that there was some evidence to suggest a link between conjunctival and lid changes with CLD, and that the strongest evidence was related to meibomian gland and lid wiper epitheliopathy changes. However, there was no convincing evidence of a link between CLD and any other tissue changes found with contact lens wear. Future research would need to look at this and preferably include longitudinal designs showing impact over time.

### **Interactions with the tear film**

Associate Professor Jennifer Craig explained how there were 'significant gaps in our understanding of the extent to which tear film changes in contact lens wear are responsible for CLD'. It seems CLD is related to decreased tear stability, increased evaporation, reduced tear turnover, and tear ferning. 'Given the relevance of pre-lens tear film stability in CLD, future research should focus on the development of novel materials or surface treatments to resist tear evaporation during wear, and on the development of wetting agents in care products to promote long-term contact lens wettability.'

### **Trial outcomes and design**

Dr Robin Chalmers underlined how research studies to this date have been less than ideal, with small numbers of participants and (surprisingly) rarely focusing on the specific nature and

aetiology of the discomfort. Rather, they have been more likely to look at individual care system or lens performance. There are many examples of study bias in this area and future studies would need to avoid these.

## Management and therapy

Professor James Wolfssohn emphasised the challenges in managing and treating CLD. Careful history is obviously essential and it is important to remember that the blanket term 'symptom' may mask an underlying or associated co-morbidity. He concluded with the declaration that 'given the current state of knowledge of CLD, some patients will have residual levels of CLD that are sufficiently bothersome that it causes them to discontinue contact lens wear'.

## The future

It might seem that such an assembly of stellar names in the field of contact lens research has concluded little of concrete value here, but these reports represent a significant step in moving ahead and, through a more formal and standardised approach to research, may begin to make inroads into the considerable challenge of discomfort.

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