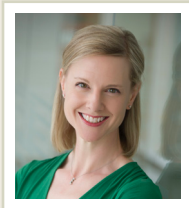


Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Canadian Dry Eye Summit: Conference review

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Introduction

The second Canadian dry eye summit (CDES) was held in November 2019 in Toronto. Sold-out for months prior, the two-day meeting was positioned as being designed to take an eye care professional's dry eye practice to new heights. So, what did the packed room of nearly two hundred practitioners learn during the conference, and how easy might it be to apply that knowledge in practice? This issue of contact lens update discusses key themes coming out of the conference, reports on the tips shared for how to start and run a dry eye-focused practice, highlights some interesting papers from the field, and reviews the use of different symptom questionnaires. The editorial reviews some of the education shared on the first day. Contained in the 'conference highlight' section of this issue is a summary of the many useful, practical tips that were shared to help practitioners apply their knowledge in practice.

Systematic approach to dry eye disease

Dr ETTY BITTON (University of Montreal) delivered a crystal clear overview of how to make use of the Tear Film and Ocular Surface (TFOS) society's Dry Eye Workshop II (DEWS II) report in practice. She highlighted key wording in the definition of dry eye disease, pointing to the role of hyperosmolarity and ocular surface inflammation and their contribution to the 'vicious cycle' of inflammation in particular. She then walked delegates through the TFOS DEWS II flow charts that enable dry eye disease to be classified correctly, based on the combination of signs and symptoms present.¹ The focus of her talk was to encourage practitioners to take a systematic evidence-based approach to each patient. This involved the routine use of the TFOS DEWS II diagnostic algorithm, from initial symptoms quantified by questionnaire, through to identification of at least one of three homeostasis markers – reduced tear break up time, increased tear osmolarity, and ocular surface staining.²



Once the presence of dry eye had been confirmed, the next step, she reminded us, was to understand the subtype (aqueous deficient, evaporative or mixed disease). Subtype classification is crucial to recommend the most appropriate treatments and ongoing management for each patient. Dr Bitton then illustrated the application of both the diagnostic and treatment algorithms,³ via a series of case studies that covered many different types and severity of dry eye disease. The Centre for Ocular Research & Education (CORE) has summarised both algorithms, along with some examples of management for eye care practitioners to refer to, available for download [here](#).



Key points from Dr Bitton's talk were a reminder that current students of Optometry are being taught these processes, making it incumbent for those of us qualified longer to ensure we keep up with current evidence-based best practice. She reminded us to always follow the science and

always ask for evidence as new techniques and treatments become available.

Dry eye disease and vision

Arguably, an often-overlooked area is the effect that a compromised ocular surface and tear film has on vision. **Dr Scott Schachter** (Private practice, California, US) shared a personal story where higher order aberrations found prior to his own LASIK procedure were dramatically improved through the short term use of anti-inflammatories. This experience reminded him just how important the initial interface between the air and tear film is for vision. He also illustrated the dioptric change that can occur through irregular thinning of the tear film, suggesting that a 1.30D change is possible, inducing effects equivalent to the disruption that occurs with higher order aberrations. The resulting visual changes manifest as reduced retinal image quality and ultimately reduced visual function. In fact, fluctuating vision has been identified as a key symptom of dry eye, with more than half of dry eye patients (57.6%) reporting fluctuations, compared to just 10% in a control group.⁴

Recognising that it is difficult to test for reduced visual quality in practice, he shared some research that helps visualise the induced higher order aberrations that occur in different types of dry eye. An aqueous deficient example, with low tear volume and the ocular surface in poor condition, was shown to have blurred vision throughout the inter-blink period.⁵ Conversely, an eye with short tear film break up resulting from borderline evaporative dry eye had fluctuating vision which became worse the longer the eye was kept open after the blink.⁶ He also shared research that examined objective measures of visual quality in dry eye, finding significant differences between dry eye subjects and controls, and suggesting clinicians may eventually be able to access some of these techniques to assess and monitor effectiveness of treatment plans over time.^{7,8}

Dr Schachter illustrated the relationship between dry eye disease and modern life. With increased time spent doing concentrated tasks on digital devices, what is the impact on the eye? What happens to blink rate during detailed tasks for example? A comparison of six different controlled reading conditions found that the level of cognitive demand reduced blink rate across all types of reading device, but only reading on electronic devices resulted in an increase in the number of incomplete blinks.⁹ A recent study examined the relationship between incomplete blinks and dry eye disease, reporting incomplete blinks are associated with reduced tear break up time, increased OSDI score and increased Meibomian gland dropout.¹⁰ As such, the report suggested, assessment of incomplete blinks may be useful to consider as an additional measure for the assessment of mild-moderate dry eye.

Finally, the talk examined the impact poor vision has on quality of life, providing a solid rationale for why eye care professionals should pay more attention to this aspect of dry eye disease for patients. The Beaver Dam Offspring study found dry eye was associated with lower quality of life in both health-related and vision-specific questionnaires.¹¹ Reading speed is impaired in these patients,¹² along with a reported impact on driving performance.¹³

Modern interventions in dry eye management

The conference keynote was given by **Dr Laura Periman** (Private practice, Seattle, US). Echoing similar messages to Dr Schachter, she talked about the biopsychosocial factors that are considerations for dry eye disease: the effects on quality of life, incidence of depression and anxiety, the burden of cost of treatment and loss of work, the burden of time to seek help and to maintain treatment regimes. All useful reminders of the wide-ranging impact dry eye can have on patients, and why, when an eye care professional can help make a difference, these sufferers often become loyal and extremely grateful patients.

Dr Periman's talk focussed on the up to 86% of dry eye patients that have some element of evaporative dry eye with associated Meibomian gland dysfunction.¹⁴ She focussed on the importance of recognising, and then

treating, the level of inflammation present. In her practice she often uses the diagram of the cycle of inflammation to help explain to patients why they need treatment and how that treatment is going to help them by disrupting the vicious cycle. Ultimately, she reminded us, patients want to feel good via relief of their symptoms, and to look good through reducing levels of redness.

Intense-pulsed light (IPL) therapy is one way to achieve this, with advantages that it is fast and effective. This therapy has been the subject of many recent trials, and shows good efficacy in improving the components that contribute to Meibomian gland dysfunction: reducing the presence of bacteria and Demodex, lowering levels of inflammatory markers and overall inflammation, improving the condition of the meibum and reducing the numbers of obstructed glands.

Dr Periman reminded delegates of the overlap between dry eye and inflammatory conditions of the skin, for example the significant proportion of rosacea patients that also have Meibomian gland dysfunction. She also shared a new piece of work examining the microbiome of the gut, where reduced diversity was found in dry eye patients compared to controls.¹⁵ This, it was felt, had important implications when considering treatment options for dry eye patients, and may provide good reason to recommend anti-inflammatory therapies such as IPL instead of antibiotic regimens that may further reduce an already depleted gut microbiome. A key take away from her talk was the focus on inflammation and that no one single treatment could be deemed a “magic bullet”, but rather that the most effective treatment regimens would likely be a multi-pronged approach to reduce inflammation and then maintain any gland improvements over time.

Contact lenses and dry eye

The distinction between dry eye disease and contact lens discomfort was clearly explained when **Dr Lyndon Jones** (CORE, University of Waterloo) took to the stage. Contact lens discomfort was tackled in a 2013 TFOS report, and is defined as “*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 ocular environment, which can lead to decreased wearing time and discontinuation of contact lens wear.*”¹⁶ When this definition is used, the difference between contact lens discomfort and dry eye becomes clear, as the latter must present with a minimum level of symptoms in the absence of a contact lens. Dr Jones went on to discuss the situation of contact lens discomfort specifically and the evidence that exists to make informed changes to try and improve comfort when it is not optimal.

In the extensive 2013 review, a number of lens material and design factors were identified as not being drivers of contact lens comfort. These include logical sounding factors such as material ionicity and tear lens exchange, through to the somewhat surprising elements of increased oxygen transmissibility (Dk/t) and modulus.¹⁷ A number of material and fit factors did have evidence that they can positively influence comfort however, including a good lens fit, shorter replacement frequency, high in vivo (in eye) wettability, and low friction.¹⁷ Dr Jones covered some examples of material technology designed to enhance comfort such as additions of wetting agents to the blister pack, or wetting agents that are permanently bound in the lens material, or designed to elute from the lens with wear, depending on the proprietary technology in question. Novel technologies such as a material with a silicone hydrogel core and a hydrogel surface were mentioned, along with novel coatings found on rigid gas permeable and scleral lenses. Use of care solutions can influence comfort, with removal of solutions being reported as the most comfortable option.¹⁸ Reusable lens comfort can be altered by changing the combination of material and solution,¹⁹ a point worth bearing in mind for patients wearing two week or monthly disposable lenses.

The patient can also influence contact lens comfort, with factors such as systemic medications, allergies, hydration, alcohol consumption, smoking, and lens wear and care compliance all potentially reducing how good the lens feels when worn.²⁰ The condition of the tear film, ocular surface and lid margins can of course also influence comfort. With cross over to some dry eye topics, the presence of *Demodex* is relevant, having been

shown to be higher in lens wearers,²¹ and also more common in contact lens dropouts too.²² Lid margins should be routinely assessed in contact lens wearers, instigating treatment such as lid cleansing, warm compresses and expression depending on their condition.

In addition to the information covered in the talk, it is of interest that a recent study reminds us not all “dry eye” in lens wearers is contact lens-induced, with subjects who experience continuing symptoms on lens removal being shown to have significantly worse clinical measures and an underlying dry eye condition.²³ These situations may not respond to simple contact lens discomfort recommendations and would also need the dry eye condition diagnosing and managing in order to try and improve overall levels of comfort, both with and without their lenses.

Dry eye and ocular surgery

In the last session of the day the subject of dry eye was examined in relation to ocular surgery. **Dr Sondra Black** (Johnson & Johnson Vision) started by showing that patients have high expectations for their levels of post-operative vision and ocular comfort. “It is important to realise that those outcomes are influenced by the pre-operative condition of the ocular surface” she said. Sharing unpublished data, she showed that 80% of cataract patients present with signs and symptoms of dry eye. These results are supported by the Prospective Health Assessment of Cataracts Patients’ Ocular Surface (PHACO) study that found 63% of patients had tear break up time of less than five seconds, and 77% had significant corneal staining prior to surgery.²⁴ Left untreated, dry eye affects the accuracy of pre-operative measurements, and levels of post-operative vision, comfort and overall refractive outcome. Given the significant numbers of patients presenting without symptoms, Dr Black recommended that all patients be evaluated for meibomian gland dysfunction prior to referral.

Once dry eye and ocular surface disease have been discovered in the patient awaiting surgery, the management options that can be undertaken are not fundamentally different from the typical management of dry eye disease. What is different is the recommendation to treat the ocular surface even if the patient is asymptomatic, and, potentially, to accelerate certain treatments such as the short-term use of steroids, and heat-assisted in-office gland expression to expedite ocular surface improvement prior to the procedure.

Conference summary

The initial impression of the meeting was “this feels different”. Different compared to many other large optometric conferences. Different in a genuinely good way. The dry eye summit had a carefully selected balance of speakers over the two days: from specialist dry eye practices, from newly set-up dry eye offices, and from academia. Yes, the level of education was high and credible, but much more than that, the conference truly did deliver an aspirational ‘how-to’ guide for getting started in the specialist management of dry eye disease. The advice from the podium was rooted in experience from day-to-day practice, and the level of engagement in the room seemed borne out of a deep-seated interest in gaining practical knowledge easily translatable into their own offices. Practical sessions had been built into the day to allow delegates the chance to experience diagnostic and management techniques for themselves. Given the quality of the meeting and level of engaged delegates, it is not surprising that in 2020 this conference doubles, being held in two different Canadian cities during the year.

Those important tips on ‘how’ to do this in practice are summarised in the conference highlights section of this issue. An in-depth write up of advice on nutrition and the eye forms the ‘featured article’, and a review of commonly used symptom questionnaires can be found in the clinical insight section.

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