

Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

The CLEAR reports – clarity, consensus, and cogitation

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Introduction

Given the pace of change of technology, it is reasonable to assume that contact lens practice will undergo substantial change during every eye care practitioner's (ECP) career. A rapidly evolving landscape obliges all ECPs to remain informed of the latest research and evidence-based guidance and adapt practices accordingly. However, accommodating substantial amounts of reading alongside the running of busy practices presents an impractical, if not insurmountable, challenge.

The Contact Lens Evidence-based Academic Reports (CLEAR) embarked upon the formidable task of consolidating several decades worth of research, to update practitioners, colleagues in industry, researchers, educators, and other interested parties, in ten key areas of contact lens practice. The collaborative effort involved over 100 globally located colleagues. Whilst initial plans to meet in-person were thwarted by the onset of the COVID-19 pandemic, this did little to dampen enthusiasm or impede the project's progress.¹ Under the guidance of 10 report leads, the project culminated in April 2021 when the reports were published in a special issue of the journal *Contact Lens and Anterior Eye*.

Links to summaries of each report are provided below and summaries of each report are available in the 'Feature Article' section of this edition of Contact Lens Update.

Rationale For Global Consensus Reports

Previous work by the Tear Film and Ocular Surface Society (TFOS),² the International Myopia Institute (IMI)³ and others has established a model for global consensus reports in eyecare. In addition to guiding clinical practice, consensus reports help identify gaps in the evidence base and galvanise future research efforts.

CLEAR represents the first major global consensus encompassing contact lens discomfort since 2013.⁴ In the intervening years, novel product categories and treatments have been introduced and newer areas of practice such as myopia management have also begun to gain momentum. Suffice to say, the CLEAR papers warrant their widespread anticipation.

What Do The Reports Offer?

Despite spanning approximately 300 pages, CLEAR manages to provide succinct accounts of contact lens research without compromising on key details. The reports are rich with facts and evidence-based clinical pearls that are directly applicable to contemporary contact lens practice.

Although each report can be appreciated as a stand-alone publication; several unifying themes help establish a cohesive body of work.

Improved communication through standardised terminology

The customary practice of naming bodily structures after individuals is longstanding. Yet whilst most ECPs may readily identify an Adam's apple, identifying your Wormian bones or Pacinian corpuscles might prove more challenging! Eponyms are not always the most practical choice in medicine, thus CLEAR advocates retitling corneal layers by designating more literal descriptors. This means Bowman's and Descemet's layer become the anterior and posterior limiting lamina respectively. A similarly logical approach is proposed for other terms, e.g., rigid *corneal* lenses instead of rigid *gas permeable* lenses. A change that reflects the fact that all contemporary rigid materials are gas permeable, with the addition of the word 'corneal' to enable distinction from scleral lenses.

Alongside updates to nomenclature, a consensus has been reached for defining commonly used expressions e.g., 'medical contact lenses'.⁵ The need for unanimity is not merely academic; the reports advise that healthcare insurance claims may depend upon the use of specific terminology.

Skills development – how to read a paper

The reports seek to critically appraise and summarise evidence, but as described in the 'evidence-based contact lens practice' report, evidence itself is subject to a hierarchical system where studies may be stratified into the weaker (e.g., case reports) through to the much more robustly designed and minimally biased evidence (e.g., randomised control trials).⁶

Elsewhere, the ramifications of incongruous studies are laid bare: progress in areas such as contact lens comfort is reported to have been hampered by a lack of standardisation, making comparisons between experiments more challenging.⁷

These insights offer readers an opportunity to improve an invaluable skill; aptitude in critically examining future research outputs.

Back to basics – optical principles and ocular anatomy

A recent resurgence in scleral lens prescribing and increasing interest in orthokeratology, may provoke a desire to better understand lens designs. A reminder of such fundamentals is provided in the reports pertaining to optics,⁸ orthokeratology,⁹ and scleral lenses,¹⁰ which offer a helpful foundation from which to discharge a more sophisticated and personalised approach to eye care.

The CLEAR reports also consider how the optics and anatomy of the eye are not static throughout an individual's lifetime. Accompanying the beautiful illustrations in the anatomy report is a reminder of how changes in refractive error, loss of accommodation, and changing tear properties, necessitate a pliant, patient-centred, approach to contact lens fitting.^{8,11}

Reflection – scrutiny of widely accepted practices

Reflecting upon the origins of dropout rates may not possess quite the same allure as learning about lenses that let you scroll through text messages, but these simpler aspects of clinical care are crucial to sustaining a viable practice. The reports review evidence for such core areas, including a thorough dissection of the contact lens appointment; wherein challenges to widely accepted practices are likely to provoke debate.

Of note, is the paucity of research evidence for practice fundamentals such as the contact lens teach and, despite a growing older demographic, an inability to identify which patients will make for successful multifocal lens wearers.⁶

Complications – out with the old, in with the new?

One-third of contact lens wearers will develop complications.¹² Such figures are clearly undesirable, but reassuringly most complications are mild, and an excellent reference table is provided within the complications report, outlining presenting features and causative factors.

By describing how lens design and power influence oxygen transmissibility, the reports also help dispel the myth that introduction of newer lens materials has eradicated the use of hydrogel lenses completely, reporting for daily disposable open eye wear that hydrogels have a long history of safe wear.

Closely aligned to the topic of complications is patient compliance. Several reports stress the critical role of good patient-practitioner communication,^{1,6,12} with recommendations to supplement in-practice education with written and online materials for home use. Advances in the use of antimicrobial lens and case coatings offer further promise of minimising complications.

The ECP of the future – where do we stand?

In addition to chronicling the many triumphs and missteps of contact lens innovations past, CLEAR provides an engaging commentary of pipeline developments, creating a palpable sense of the ECP's growing role in both monitoring and treating disease.¹³

The clinical benefits of monitoring physiological changes through use of contact lens embedded biosensors; the potential to acquire continuous diurnal measurements; and the development of a more efficacious method of drug delivery are all of obvious benefit. Yet so many of the so-called 'smart' contact lenses have eluded commercialisation.

The 'contact lens technologies of the future' report, provides a reminder that while change in the field appears to be rapid, developmental timelines are not. Perhaps, however, there is an advantage to these prolonged experimental periods since they allow the opportunity to prepare for the imminent arrival of new lens categories. Consideration of how such lenses will be prescribed, by whom, and where the limits of the prescriber's responsibility lies, are all points which will need to be addressed. How, for example, will privacy concerns relating to lenses that allow discrete capture of photographs be regulated? These are uncharted waters for ECPs. In the meantime, many ECPs around the world can recognise they already have access to lenses that go beyond refractive error correction, providing slowing of axial length growth for myopia management for example. Drug-delivery will soon become available, with the imminent global launch of an antihistamine-releasing contact lens for ocular allergy symptoms and recent approval in two countries already.

An Improved Toolkit To Match A Field In Flux

Innovation brings new opportunities, and CLEAR is brimming with ideas for practitioners to expand services, develop niches, and possibly deliver a more professionally satisfying approach to lens fitting.

In the short interim between initiating the reports and their publication, newer conditions such as Mask Associated Dry Eye (MADE)¹⁴ and a reported increase in 'quarantine' myopia,¹⁵ are already changing eyecare priorities.

Alongside these unexpected influences are more predictable pressures, such as shifting demographics, that will

likely govern future prescribing trends. Increasing longevity may also lead to a corresponding rise in systemic health conditions, some of which future ECPs could monitor via contact lenses.

Hence, future contact lens practitioners are likely to be delivering *therapeutic* care for patients from childhood (myopia management) through to late adulthood.

In short, significant change is on the horizon, but by continuing to overlook the basic elements of clinical practice, such as contact lens attrition, the profession risks a failure to capitalise on the plethora of opportunities coming our way.

The Take Home Messages:

- Use of updated nomenclature, and consensus over the definitions of medical terminology will help facilitate communication and consistency between all stakeholders.
- Despite advancements in many areas of contact lens knowledge, core areas of practice are yet to be optimised so that comfort can be improved and dropouts minimised.
- Recent introduction of novel lens categories offers ECPs an opportunity to diversify product portfolios and the prospect of carving out specialisms and personalised approaches to eyecare.
- In the future, ECP's may play a greater role in the monitoring of both ocular and systemic health conditions via contact lens technology and there may be more opportunities for delivering therapeutic care.

REFERENCES:

1. Wolffsohn JS, Morgan PB, Barnett M, *et al.* Contact Lens Evidence-Based Academic Reports (CLEAR). *Cont Lens Anterior Eye* 2021;44:129-31.
2. Craig JP, Nelson JD, Azar DT, *et al.* TFOS DEWS II Report Executive Summary. *Ocul Surf* 2017;15:802-12.
3. Wolffsohn JS, Flitcroft DI, Gifford KL, *et al.* IMI – Myopia Control Reports Overview and Introduction. *Invest Ophth Vis Sci* 2019;60:M1-M19.
4. Nichols JJ, Jones L, Nelson JD, *et al.* The TFOS International Workshop on Contact Lens Discomfort: Introduction. *Invest Ophth Vis Sci* 2013;54:TFOS1-6.
5. Jacobs DS, Carrasquillo KG, Cottrell PD, *et al.* CLEAR – Medical use of contact lenses. *Cont Lens Anterior Eye* 2021;44:289-329.
6. Wolffsohn JS, Dumbleton K, Huntjens B, *et al.* CLEAR – Evidence-based contact lens practice. *Cont Lens Anterior Eye* 2021;44:368-97.
7. Willcox M, Keir N, Maseedupally V, *et al.* CLEAR – Contact lens wettability, cleaning, disinfection and interactions with tears. *Cont Lens Anterior Eye* 2021;44:157-91.
8. Richdale K, Cox I, Kollbaum P, *et al.* CLEAR – Contact lens optics. *Cont Lens Anterior Eye* 2021;44:220-39.
9. Vincent SJ, Cho P, Chan KY, *et al.* CLEAR – Orthokeratology. *Cont Lens Anterior Eye* 2021;44:240-69.
10. Barnett M, Courey C, Fadel D, *et al.* CLEAR – Scleral lenses. *Cont Lens Anterior Eye* 2021;44:270-88.
11. Downie LE, Bandlitz S, Bergmanson JPG, *et al.* CLEAR – Anatomy and physiology of the anterior eye. *Cont Lens Anterior Eye* 2021;44:132-56.
12. Stapleton F, Bakkar M, Carnt N, *et al.* CLEAR – Contact lens complications. *Cont Lens Anterior Eye* 2021;44:330-67.
13. Jones L, Hui A, Phan CM, *et al.* CLEAR – Contact lens technologies of the future. *Cont Lens Anterior Eye* 2021;44:398-430.
14. Moshirfar M, West WB, Marx DP. Face Mask-Associated Ocular Irritation and Dryness. *Ophthalmol Ther* 2020;9:397-400.
15. Wang W, Zhu L, Zheng S, *et al.* Survey on the Progression of Myopia in Children and Adolescents in Chongqing During COVID-19 Pandemic. *Front Public Health* 2021;9:646770.