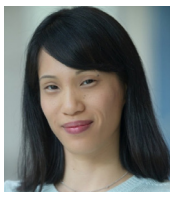
Contact Lens Update
CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Evidence-Based Contact Lens Practice

June 15, 2021



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Wolffsohn JS, Dumbleton K, Huntjens B, et al. CLEAR – Evidence-based contact lens practice. Cont Lens Anterior Eye 2021;44:368-97

The evidence-based contact lens practice report summarizes previous research findings to enable a practitioner to decide on the best contact lens to fit and how to manage problems with soft and rigid corneal contact lenses.[1] The report covers all the visits that a practitioner will encounter with a new or existing contact lens patient, including topics to discuss in the history and symptoms, how to examine the anterior eye, how to choose which lens to fit, how to assess the fit and evaluate visual performance, through to prescribing and conducting an aftercare visit.

History and Symptoms

In order to aid lens selection and optimize successful contact lens wear, a history and symptoms assessment should include: reason for visit, age, ocular symptoms and history, general health and medication, occupation and work environment, hobbies, and lifestyle (including driving, smoking, alcohol, use of eye cosmetics). Daily disposable contact lenses should be considered as first choice in a number of situations where increased risk factors for corneal infiltrative events are present. Ocular symptoms should be assessed in both habitual contact lens wearers and in neophytes prior to lens fitting, using a validated questionnaire (e.g. Contact Lens Dry Eye Questionnaire (CLDEQ-8) for lens wearers, or the Standard Patient Evaluation of Eye Dryness (SPEED), or Ocular Surface Disease Index (OSDI) for neophytes). Since the prevalence of dry eye and meibomian gland dysfunction increases with age and systemic medications can alter the ocular surface, a detailed examination of the quality and quantity of the tear film, and ocular surface is required to assess the health of the eyes.

Anterior Eye Evaluation

A thorough assessment of the anterior eye is required prior to lens fitting and at each subsequent aftercare visit. Least invasive tests should be performed first, with more invasive tests involving lid eversion and/or use of diagnostic dyes performed last. The tear film should be assessed using non-invasive techniques, such as with a cold light source or a placido disc video topographer. Corneal topography can be evaluated with a conventional keratometer over the central 2-3 mm of the cornea, although video topography will permit a more extensive view of the cornea. Taking multiple images in different positions of gaze with a video topographer can help eliminate shadows from the ocular adnexa. The shape of the anterior and posterior cornea, and sclera can be viewed using optical coherence tomography (OCT), scanning-slit, or Scheimpflug cameras.

Slit lamp examination is necessary at each visit to assess the fit of a contact lens, along with the anterior eye and adnexa. Practitioners should refer to a grading scale at each visit and use white light to record the level of blepharitis, meibomian gland dysfunction, bulbar and limbal hyperemia, corneal neovascularization, and palpebral conjunctival hyperemia. Palpebral roughness of the everted upper and lower lid also be graded with the use of sodium fluorescein. Grading scales should be recorded to the nearest 0.5 step. A grade >2 may indicate intervention is required, while a change >1 grade is typically thought to be clinically significant. Use of slit lamp photography and videos can assist with record keeping, management, and patient education.

Fluorescein should be instilled by adding a drop of saline to a paper strip. After shaking the strip to remove excess liquid, apply the strip to the temporal canthus. Optimal viewing conditions are under blue light and a yellow filter. Corneal staining is best observed 1 to 3 minutes after instillation of fluorescein. Conjunctival staining is ideally assessed with lissamine green, if available. To instill lissamine green, place a drop of saline on the paper strip for at least 5 seconds. Staining is best viewed with white light 1-4 minutes after instillation. A red barrier filter can help enhance the staining. Practitioners need to record corneal and conjunctival staining with a drawing and describe the depth of staining.

In addition to investigating the presence of blepharitis and meibomian gland dysfunction, the conjunctiva should also be examined for lid-parallel conjunctival folds (LIPCOF) and the lid margins for lid wiper epitheliopathy (LWE). LIPCOF are folds in the bulbar conjunctiva visible under white light. Although the cause is not known, LIPCOF are a fair to significant predictor of contact lens discomfort. LWE can either be visualized with lissamine green or sodium fluorescein. The full extent of LWE staining is visible using 2 strips of lissamine green to instill a drop of dye of one-minute apart. Staining should be assessed with the lids everted under white light between 1-5 minutes after instilling the second drop of lissamine. Two drops of fluorescein can also be instilled one-minute apart and viewed 3-5 minutes after application of the dye. A consistent relationship between LWE and contact lens discomfort has not been found.

Lens Selection

Assessments that may influence lens choice include different measurements of the ocular surface. Horizontal visible iris diameter values will be significantly different depending on the technique used to measure it. Despite a lack of evidence to guide a practitioner's choice of lens diameter, it is thought best to avoid the contact lens interacting with the limbal region. Although practitioners commonly measure vertical palpebral aperture, no scientific literature has found that it is necessary to fit a contact lens. The report includes a table providing further guidance on lens selection based on specific general health conditions and patient history, refraction, and the health of the ocular surface.

Soft Lens Selection

Keratometry and corneal topography do not strongly predict the fit of a soft contact lens. Ideally the sagittal height of a soft contact lens should match the corneal sagittal height to ensure good movement. As these values are not easily accessible, 75-90% of eyes can be adequately fit with a mass-produced soft contact lens. Custom-designed lenses should be fit when mass-produced lenses are unsuitable. Although pupil size is theoretically understood to impact the performance of multifocal soft contact lenses, it has not been shown clinically to impact how the lens performs when worn. Soft contact lens comfort is mainly affected by the lubricity of the lens surface and the coefficient of friction.

Lenses must be used in accordance with their regulatory indication. The term "overnight wear" was introduced in the report to encompass napping in a lens, extended wear up to 7 days, and continuous wear up to 30 days. Overnight wear increases the risk of contact lens complications, with similar rates of microbial keratitis found with silicone hydrogel and hydrogel contact lenses. Daily disposable lenses can reduce the severity of microbial

keratitis and help reduce symptoms in those suffering from ocular allergies.

Soft Lens Fit

A poor fitting soft contact lens can affect the physiology of the eye and lead to drop out. The fit should be assessed 10 minutes after insertion and the patient asked to rate the comfort on a 0 [poor] to 10 [can't feel] scale. Centration should be recorded, along with the three tests most predictive of lens mobility: post-blink movement in upgaze, horizontal lag, and push-up recovery speed. Poor movement after 10 minutes of wear with a blink or push-up should be considered an unacceptable len fit. The vision and lens marking orientation of a well-fitting toric lens should be assessed. When fitting monovision or multifocal lenses, sensory dominance should be tested. Although it is commonplace to optimize the prescription in the dominant and non-dominant eye, no evidence was found to support this practice. Multifocal visual performance should be assessed using with real-world tasks, rather than standard vision tests.

Rigid Corneal Lens Selection

Corneal topography is necessary to select the base curve for a rigid corneal lens and total diameter should be 2 mm smaller than the horizontal visible iris diameter. Adapted lens wearers may appreciate improved comfort with a large diameter lens. Measurement of pupil size is necessary to prevent glare and haloes from an inadequate back optic zone diameter. Advantages of rigid corneal lenses include better tolerance in people with dry eye, and fewer complications, including microbial keratitis.

Rigid Corneal Lens Fit

A poor rigid corneal lens fit can affect comfort and cause corneal staining. The report includes a revised scheme to assess the fit of a rigid corneal lens. Ask the patient to rate the comfort on a 0 [extreme discomfort] to 10 [no lens sensation] scale and evaluate: coverage, centration, inter-blink movement, and assess the primary fluorescein pattern in each principal meridian between 30 seconds to 3 minutes after instillation of fluorescein. Use of an anesthetic at the initial fitting appointment can improve comfort, reduce anxiety, and decrease drop out. Another helpful table found in the report is one that lists the minimum change required to significantly change the fluorescein pattern on an average cornea.

Prescribing

Poor handling can lead to drop out and contact lens complications. Due to poor retention of information, both verbal and written information should be given to patients at the teaching appointment. Soft lenses can be worn without the need for patients to build up their wearing time. However, soft multifocal wearers may need 15 days for sensory adaptation to their lenses, while rigid corneal lens wearers may require 2-3 weeks for comfort adaptation.

One-step hydrogen peroxide systems are often used as a way of troubleshooting problems, but the report recommends their use could be more routine. However, if a multipurpose solution is used, patients must be advised to rub the lens. Conflicting advice exists regarding how often to replace a case and how to clean them. Cases should be cleaned by manually rubbing or wiping them with a clean tissue, and by putting the case face down to dry. Neither contact lenses nor their storage cases should come into contact with tap water.

Aftercare

Frequent follow ups should be made for neophytes to reduce the risk of drop out over the first couple months of lens wear, especially in toric and multifocal lens wearers. Another useful table included in the report covers the

procedure to be followed at a routine aftercare visit. Routine aftercare visits should include the use of fluorescein, lid eversion and be conducted at the following intervals:

- Soft daily disposable: 24 months, although local preference and/or regulatory guidelines may recommend 12 months
- Soft daily reusable and rigid daily wear: 12 months
- Soft and rigid overnight wear: 6 months

More frequent visits may be required in specific cases, including progressing myopia or advancing presbyopia.

Conclusion

The report concludes by acknowledging the gaps that still exist in evidence-based practice, and the limitations of some study designs and data. That said, it finishes with an important reminder of the need for ECPs to ensure they are conducting evidence-based practice wherever possible, in order to provide the best outcomes on the safe wear and care of contact lenses.

The Clinical Insight section of this issue of Contact Lens Update contains a summary of all the CLEAR papers. It is fundamentally based on the patient journey through the process of contact lens fitting, drawing heavily on the steps outlined above. It is designed to provide a quick reference to many of the key points raised across all the reports, and is free to download.

REFERENCES:

1. Wolffsohn JS, Dumbleton K, Huntjens B, *et al.* CLEAR – Evidence-based contact lens practice. *Cont Lens Anterior Eye* 2021;44:368-97.