

Title: Orthokeratology: Interactive Round Table. Implementation and Fitting into Your Practice.

Speakers:

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Description: This interactive presentation will deliver ideas and tools for effectively implementing orthokeratology (OK) into a practice setting. We will discuss how to have productive conversations with patients seeking OK as an alternative to daily contact lens wear or refractive surgery. Additionally, we will discuss options for parents seeking myopia management with orthokeratology. The concepts of safety and handling of OK lenses, how to set patient and/or parent expectations to maximize successful outcomes in a practice setting, how to effectively flow through a complete orthokeratology fitting process, the importance of proper staff training, and getting down to the finite details of fitting orthokeratology lenses, fitting tricks and troubleshooting tips.

Learning Objectives:

1. Understand orthokeratology indications
2. Learn how to present ortho-keratology to patients/parents so they understand what to expect from the treatment.
3. Understand how to set expectations for ortho-keratology in order to maximize patient and practitioner success.
4. Implement and apply orthokeratology fitting protocols and processes in their clinical practice
5. Understand on how to use topography for fitting success of orthokeratology
6. Implement and apply effective practices relating to office flow and how to train staff for orthokeratology fitting procedures.

COPE Outline

I. Overview of clinical aspects:

1. Orthokeratology concepts

- a. Share the minimal effect on the eye
- b. Share how it helps to bend light to improve vision/slow progression

2. What makes a good candidate for orthokeratology lenses?

- 1. refractive error
- 2. keratometry/topography
- 3. HVID
- 4. Pupils

3. Discussion around Safety of Ortho-k

- a. What are the statistics for safety
- b. What can parent/child/patient do to increase safety of lens wear
 - i. Hand washing
 - ii. Cleaning of lenses
 - iii. Replacement schedule

4. Discussion of expectations

- a. How often to wear lenses
- b. How much lens wear is needed
- c. What expectations do we have for vision
 - i. What can be done to further enhance vision
- d. Discussion of possible variability of vision.

5. Discussion of office flow

- a. When should you incorporate an orthokeratology fitting?
- b. Should you have a myopia management and orthokeratology discussion during a comprehensive visit or during a separate consultation visit?

c. Should you charge for your consultation visit?

d. Scheduling for success

i. if myopia management, book a separate consultation visit

1. baseline AXL measurements

2. cycloplegic refraction

3. baseline topography

4. ocular health assessment

6. Follow up visits for orthokeratology fittings

a. Initial fitting

b. Should you perform a diagnostic fitting or an empirical fitting?

c. Initial Fitting flow:

1. Diagnostic fitting decision tree

ii. Application and removal training

1. Pearls for success

iii. Day 1 follow up:

1. Patient/child will come in wearing OK lenses

2. Visit should ideally be in the morning after dispense day

3. Check for lens binding

4. Provider to remove lenses

5. Topography after lens removal

6. Discussions with child/family

iv. One week follow-up

1. History and symptom check

2. Vision, uncorrected

3. Refractive status check

4. Ocular health check

- 5. Topography
- 6. OK lens assessment
- 7. OK over-refraction
- v. One month, 3 month, 6 month checks
 - 1. Pearls for history taking
 - 2. Specific areas of clinical findings
 - 3. Troubleshooting
- d. Follow ups and annual checks
 - i. Assessing axial length measurements at follow up visits?
- f. Staff training and involvement
- i. Myopia control coordinator
 - 1. understanding of fees, scheduling, needs of the patient
 - 2. communication with patients/parents and families directly
 - 3. application/removal training

II. Orthokeratology Contact Lenses and Troubleshooting

- 1. Orthokeratology lenses
 - i. Lens anatomy- reverse geometry design
 - ii. Required measurements to create a lens
 - iii. Centration is key to properly fit an Ortho-K lens for myopia management
 - iv. How to assess if the Ortho-K lens is effective with topography
 - v. Assessing cornea health when using OrthoK lens
 - 2. Troubleshooting orthokeratology lenses through case presentations
- Smiley Face Response
- i. **Smiley Face Response** In the smiley face topographical response, the red ring decenters superior-temporally with respect to the pupil
 - 1. Centration

2. This is caused by a flat-fitting lens.
3. less-than-expected myopia reduction, an increase in with-the-rule astigmatism, or associated ghosting, glare, and flare
4. A flat, superior-riding lens has too little sagittal depth either from underestimating the corneal sagittal depth or overestimating the corneal eccentricity
5. To correct for this, increase the sagittal depth of the lens.
Depending on the lens design, practitioners can accomplish this in a number of ways that include steepening the alignment curve, the BOZR, or the reverse curve zone. Additionally, widening these curves can also increase the sagittal depth of the lens and fix the problem of a smiley face topography

6.

3. Frowny Face Response

- i. With a frowny face response, the red ring decenters inferiorly with respect to the pupil
 1. Centration
 2. This is caused by a steep-fitting lens.
 3. A patient who presents with this topography pattern may have less myopia reduction than expected, an increasing amount of astigmatism, or associated ghosting, glare, and flare.
 4. A frowny face topography is caused by the lens having too much sagittal depth from either overestimating the corneal sagittal depth or underestimating the corneal eccentricity. A smaller overall lens diameter may cause this as well.
 5. Remedy this topographical response by reducing the lens sagittal depth. This can be accomplished by flattening the alignment curve, the reverse curve, or the BOZR. Decreasing the width of these curves will also decrease the overall sagittal depth of the lens. If a small diameter is causing decentration of the lens, increasing the diameter will help achieve a proper fit.

4. Lateral Displacement

- i. A topographic red ring that decenters nasally or temporally with respect to the pupil indicates lateral displacement of the lens
 1. Centration
 2. A patient whose ortho-k lens is laterally displaced may exhibit associated ghosting, glare, or flare; have induced astigmatism; or have vision that is reduced in the paracentral region of the pupil. Possible causes of lateral decentration are a lens that is too steep or too flat, a lens that is not large enough, an asymmetrical corneal curvature, or a decentered corneal apex.
 3. Increasing or decreasing the sagittal depth of a lens can help remedy a flat- or steep-fitting lens, respectively. If a small lens is

causing lateral decentration, increasing the lens diameter will help improve the fit. If an asymmetrical corneal curvature or decentered apex is causing decentration, altering the alignment curves or changing to a toric design lens may help with this concern.

5. True Central Island

1. **True Central Island** In a true central island, the red ring centers perfectly; however, there is also a central area of steepening on topography.
2. This area of central corneal steepening relative to the rest of the treatment zone is caused by a steep-fitting lens. A true central island has no sign of epithelial damage upon lens removal, and the central peak is $> 0.00D$ on corneal topography. The steeper the lens, the steeper the central island.
3. Patients who present with a true central island may have an over-refraction with no clear end-point, reduced best-corrected visual acuity of more than one line on the Snellen acuity chart, or unaided acuity that is worse compared to the pre-fit acuity if the cornea becomes steeper than baseline. Possible causes of a true central island include a lens sagittal depth that is too high because of overestimated corneal sagittal depth or underestimated corneal eccentricity. True central islands can be resolved by reducing the sagittal depth of the lens (similar to the changes needed to resolve a frowny face topography).

6. False Central Island

1. A false central island appears as a central peak within the treatment zone that has a topographical value of $< 0.00D$
2. This is caused by a flat-fitting lens and often is accompanied by a smiley face topography pattern of superior lens displacement. Patients who have a false central island will often have corneal staining upon lens removal from epithelial damage. Additionally, distortion of the placido disc mires may appear with topography. In these cases, patients may have associated ghosting, glare, and flare or have poor best-corrected vision if the staining is central in location.
3. A false central island is caused by heavy bearing of the lens on the corneal surface; the topographer interprets the induced epithelial damage as an area of steepening. This may be remedied by increasing the lens sagittal depth (similar to the changes needed to resolve a smiley face topography response).

7. Hands-On Training

- i. Cleaning and disinfection of scleral lenses
- ii. Selection of base curve/vault

- iii. Application with plunger vs finger techniques
 - a. Demonstrate patient positioning
 - b. Suction vs non-suction
- iv. slit lamp
- v. Vault and fluorescein evaluation
- vi. Assessing peripheral fit (landing/alignment curve)
- vii. Assessing tear flow
- viii. Removal technique
- ix. Plunger
 - 1. Importance of slightly decentered plunger placement
 - 2. Hands/finger
- x. Solutions
 - 1. Application solutions
 - 2. Disinfection solutions
 - 3. Hydrogen peroxide solutions
 - 4. compatible RGP cleaning solutions
 - 5. Additional cleaners

II. Conclusions and summary