

## Managing Myopia for Maximum Results

Jason Jedlicka, OD, FAAO, FSLs  
 Jamie Kuzniar, OD, FAAO, FSLs

*Best Education for Patient Care and Business Management*

**OPTOMETRIC  
Management  
SYMPOSIUM**

## Disclosures

### Jason Jedlicka

- Consultant to Bausch Health
- Consultant to Oculus
- Honorarium from Ovitz
- Honorarium from Tangible Sciences
- Shareholder, Lens Design Solutions, LLC

### Jamie Kuzniar

- Consultant to Bausch Health
- Speaker Alliance at Oculus
- Speaker Alliance at Alcon
- Speaker Alliance at Glaukos

## Myopia

- Why the buzz?
- Why the concern?
- What are the mechanisms?
  - Why does it occur?
  - How does it occur?
- Axial Length Implications
- Managing Myopia
  - What doesn't work
  - What does work
    - Medical
    - Optical
  - How to do it in your practice
  - Exam considerations

## Myopia: Why the concern?

- Worldwide myopia
  - 2010 – 2 billion
  - 2020 – 2.6 billion
  - 2050 – 4.8 billion people (projected that ~1 billion will have high myopia)



## Myopia: Why the concern?

- Myopia causes ocular health complications
- Can intervention reduce these complication rates by reducing the end degree of myopia?

Eye Disease	-2.00 D	-4.00 D	-6.00 D	-8.00 D
Myopic Maculopathy <sup>1</sup>	3.2x higher	9.7x higher	40.6x higher	126.8x higher
Retinal Detachment <sup>1</sup>	5.1x higher	9.6x higher	21.5x higher	44.2x higher
PSC Cataract <sup>1</sup>	1.6x higher	3.2x higher	5.4x higher	12.3x higher
Glaucoma <sup>1</sup>	1.7x higher	2.5x higher	2.5x higher	100%

## Myopia: Why does it occur?

- If 1 parent is myopic, a child has a 2-3 times increased risk of being myopic
- If both parents are myopic, a child has a 5-6 times increased risk of being myopic
- Is it genetic?
  - If so, is axial length growth / anatomy what is inherited or is the pliability of the sclera / choroid?
- Or is it learned behavior, children acquiring the same behaviors as their parents?

## Myopia: Why does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

- What correlates with myopia?
  - Studying (more hours per day = more myopia)
  - Physical Activity (more hours per day = less myopia)
  - Outdoor time (more time outdoors = less myopia)
  - Age (older = more myopia)
- Refractive Error Study in Children study (Negrel, Am J Ophthal, 2000)

	AGE 5		AGE 15	
		M	F	
China (n=5552)	3.6%	10.4%	14.7%	
Near (n=5567)	<2%			No change
China Sheny (n=6844)	0%	36.7%	55.0%	
China Guangzhou (n=4358)	3.3%	69.3%	77.8%	

## Myopia: Why does it occur?

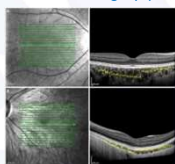
OPTOMETRIC  
Management  
SYMPOSIUM

- My personal working theory is that in a very high percentage of cases (discounting the family of ~20.00 myopes and those with ocular disease) the RISK for myopia development is inherited (the pliability of the sclera / choroid- its softness or ability to be stretched), but something must act upon it to make it happen - multifactorial
- Which means we can alter its course by changing what acts upon the eye to cause myopia's development

## Myopia: How does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

- The choroid is typically thinner in myopic compared to non-myopic eyes (most pronounced at the fovea and thins with increasing myopia and axial length in both adults and children)

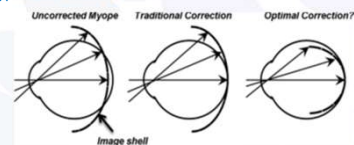


- Scleral thinning associated with axial myopia is primarily restricted to the posterior pole, due to scleral tissue redistribution. Scleral thinning may alter the tissue strength surrounding the optic nerve head, rendering myopic eyes more susceptible to glaucomatous damage

## Myopia: How does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

- Peripheral Hyperopic Defocus

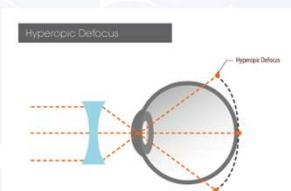


- Imposed hyperopic defocus accentuates the thinning of the choroid and lengthening of the axial eye without a disruption in rhythm

## Myopia: How does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

- Peripheral Hyperopic Defocus: A consequence of traditional corrective lenses

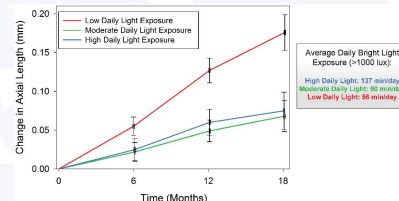


## Myopia: How does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

Light intensity outdoors results in light-stimulated release of the retinal transmitter dopamine, which is known to be able to reduce axial elongation. Inadequate light exposure means less dopamine, which can increase axial elongation

Bright light exposure (Indoor, but with intensity to equal outdoor light) thickened the choroids of chicks later in the day compared with those of control chicks exposed to normal indoor illumination



## Myopia: How does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

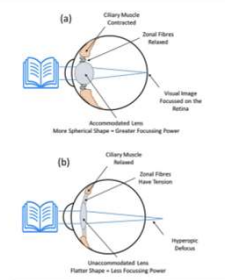
- Ciliary body activity



## Myopia: How does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

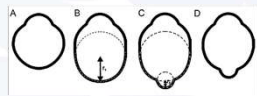
- Ciliary body activity



## Myopia: How does it occur?

OPTOMETRIC  
Management  
SYMPOSIUM

- Peripheral hyperopic defocus, high near vision demand, and lack of moderate to high light intensity all seem to contribute to myopia development
- Genetically some individuals are more predisposed to myopia
- As some myopes have more posterior staphylomatous changes and others do not, there may be more than one mechanism that drives someone to be myopic



## Myopia: Why do we care about progression?

OPTOMETRIC  
Management  
SYMPOSIUM

## Classifying Myopia

OPTOMETRIC  
Management  
SYMPOSIUM

Low Myopia -0.50D to -3.00D

Moderate Myopia -3.00D to -6.00D

High Myopia -6.00D or higher

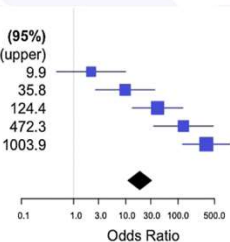
## Myopia: Implications

OPTOMETRIC  
Management  
SYMPOSIUM

### Myopic Maculopathy Vonghanit et al.

	OR	CI (95%) (lower) (upper)
-1.0 to -2.99D	2.2	0.47 9.9
-3.0 to -4.99D	9.7	2.63 35.8
-5.0 to -6.99D	40.6	13.27 124.4
-7.0 to -8.99D	126.8	34.02 472.3
<=-9.0D	348.6	121.05 1003.9

Any Myopia 18



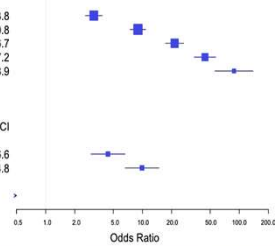
## Myopia: Implications

### Retinal Detachment Risks

Ogawa & Tanaka	OR	95% CI
-0.75 to -2.75D	3.1	2.6- 3.8
-3 to -5.75D	9.0	7.5- 10.8
-6 to -8.75D	21.5	17.3- 26.7
-9 to -14.75D	44.2	34.2- 57.2
<= -15.0D	88.2	56.1-138.9

### Eye Disease Control Study

	OR	95% CI
-1 to -2.99D	4.4	2.9- 6.6
-3 to -8D	9.9	6.6-14.8



## Myopia: Implications

### Ocular health risks

#### Glaucoma

##### The Blue Mountains Eye Study

- odds ratio (OR) for low myopia of **2.3** (95% CI 1.3–4.1) (Mitchell et al., 1999). The relationship was stronger for eyes with moderate-to-high myopia (OR 3.3; 95% CI 1.7–6.4).

##### Meta-analysis of myopia as a risk factor for glaucoma

- pooled data from 11 different studies and concluded that for low myopia (myopia up to -3 D) the odds ratio was 1.65 (95% CI 1.26–2.17) and for higher levels of myopia (in excess of -3 D) the odds ratio was higher still at 2.46 (95% CI 1.93–3.15) (Marcus et al., 2011).

## Myopia: Implications

The Risks are Not Actually Associated with Progression of Myopia, but with Increasing Axial Length

If the cornea became increasingly steep, we would become more myopic as well, but we would not have the associated retinal risks

## Myopia: Implications

### Two patients both are -1.00 D myopes:

- One with K's 46.00D and AL 23.00
- The other: K's 40.00 D and AL 26.00

- Which is more at risk for axial length related complications and requires more aggressive intervention for controlling myopia progression?

### Axial length is the determining factor

- If you don't measure it you can't assess the true risk

## Myopia: Implications

### How reliable is refraction at monitoring for change?

- 86 subjects, aged 11-60 (not children)
- For mean spherical equivalent, the average difference between five averaged automated refractor readings, taken by two different optometrists, was +0.02 D (95% limits of agreement = -0.36 to +0.40 D). The average difference between the two optometrists' subjective refractions was -0.12 D (95% limits of agreement = -0.90 to +0.65 D) (Bullimore, 1998)

	Allc (n)				Allc (n)			
	M	SD	95%	95%	M	SD	95%	95%
All children (n = 145)								
SD	0.57	0.11	0.08	0.17	0.09	0.08		
95% Total empirical interval	1.49	0.36	0.32	0.68	0.34	0.34		
Preschool children (n = 73)								
SD	0.56	0.13	0.10	0.19	0.10	0.09		
95% Total empirical interval	1.47	0.41	0.42	0.75	0.43	0.36		
Schoolchildren (n = 72)								
SD	0.57	0.07	0.07	0.15	0.07	0.06		
95% Total empirical interval	1.61	0.28	0.27	0.56	0.27	0.28		

Rauscher, Franiska G. PhD<sup>1,2</sup>,  
Lange, Heide MSc<sup>1,3</sup>, Yehaoui,  
Doktor, Maryam PhD<sup>2</sup>,  
Regehr, Helmut MD<sup>2</sup>, Stenler,  
Ina MD<sup>2</sup>, Hies, Andreas PhD<sup>4</sup>,  
Wahl, Siegfried PhD<sup>1,5</sup>,  
Wiedemann, Peter MD<sup>2</sup>,  
Ohlendorf, Arne PhD<sup>1,6</sup>,  
Blondowski, Ralf PhD<sup>2</sup>  
Optometry and Vision  
Science, November 2018,  
Volume 96, Issue A3, p. 879-889

## Myopia: Implications

### How reliable is Optical Biometry at monitoring for change?

- Partial Coherence Interferometry (PCI): .030 mm-.050 mm for AXL
  - Example: IOL Master 500, Pentacam AXL
- Optical Low-Coherence Interferometry: .035 mm for AXL
  - Example: Lenstar LS 900
- B Scan Swept-Source Optical Coherence Tomography: .024 mm for AXL
  - Example: IOL Master 700

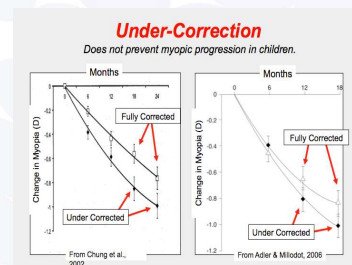
## Myopia: Implications

OPTOMETRIC  
Management  
SYMPOSIUM

- What does this mean?
  - Based on currently available data, the estimation is that a 1 D change in refractive error equals roughly .300 mm increase in Axial Length
- So biometry should be roughly 5 times more sensitive and accurate to measuring for change than measuring refractive error
- If we want to talk to our patients and their families about controlling axial length growth for the health of their eyes, then Axial Length measurements are the gold standard for myopia management

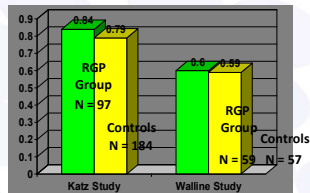
## Managing Myopia: What doesn't work

OPTOMETRIC  
Management  
SYMPOSIUM



## Managing Myopia: What doesn't work

OPTOMETRIC  
Management  
SYMPOSIUM



RGP vs. SCL - 2 year data - The RGP lens group increased in myopia - 1.56 D, the SCL group - 2.19 D.  
This difference in myopia was related to change in the corneal curvature.  
There were no differences in the axial growth

## Managing Myopia: What doesn't work (that well)

OPTOMETRIC  
Management  
SYMPOSIUM

- Bifocal / PAL glasses studies demonstrate a weak effect - less than a quarter diopter over 18 months
- PALs have been shown by [Gwiazda \(2004\)](#) to most benefit a subset of patients who have a near esophoria and a lag of accommodation greater than .50D

## Atropine

OPTOMETRIC  
Management  
SYMPOSIUM

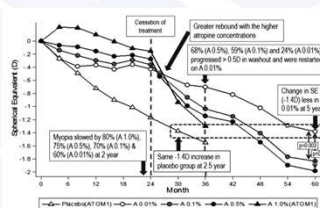
## Managing Myopia - What DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Atropine
  - Atropine has been used for many years to slow myopic progression
  - Atropine 1% is effective but has many side effects, including loss of accommodation, photosensitivity due to pupil dilation, etc...
  - Studies have investigated using lower concentrations for efficacy and side effect profiles
  - ATOM 1, 2 and 3 among many others

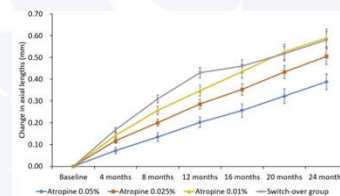
## Managing Myopia - What DOES work

- ATOM 2
- Compared different concentrations
  - .5%, .1%, .01%



## Managing Myopia - What DOES work

- LAMP study
  - Compared .05%, .025% and .01% over 2 years
  - Found .05% to be more effective



## Managing Myopia - What DOES work

- Prescribing Atropine
  - Need a compounding pharmacy
    - Locally or can use Imprimis Rx
  - You can order .01%, .025%, or .05%
  - Cost is roughly \$99 for 2 bottles or \$119 for 3 bottles, each one lasting about a month
  - What concentration do you start with?
  - Check accommodation and ask about light sensitivity at follow up
    - Recommend transitions glasses for atropine patients

## Orthokeratology

## Managing Myopia - What DOES work

- The process of altering the corneal curvature to achieve a desired refractive effect using gas permeable contact lenses



Pre-Treatment  
20/400



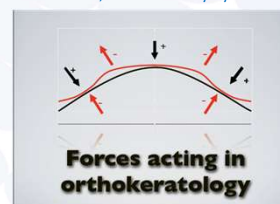
Ortho-k lens



Post Treatment  
20/20

## Managing Myopia - What DOES work

- How does it create the change?
  - Positive pushing pressures along with negative pulling pressures
  - Pressures are via fluid forces, not necessarily by direct applanation

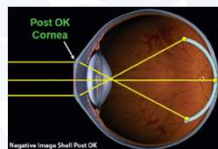
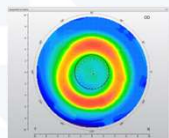




## Managing Myopia - What DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

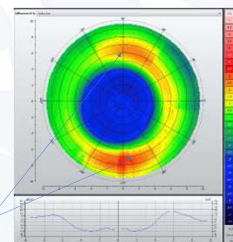
- Orthokeratology
  - Creates proper central vision correction with a MYOPIC peripheral defocus



## Managing Myopia - What DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Orthokeratology
  - It may also create a degree of "add power" to the visual system via the reverse zone that reduces near demand and requires less ciliary body action for near work

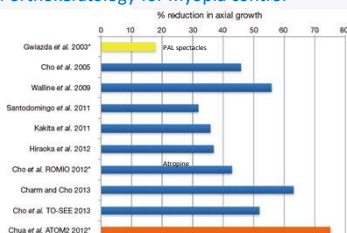


Roughly 2D of add power

## Managing Myopia - What DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Effectiveness of orthokeratology for myopia control



## Managing Myopia - What DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Is Orthokeratology SAFE?

Cont Lens Astigmatism Dec. 2015 Sep 5, pp. 51267-5484/1520013-4, doi: 10.1016/j.cll.2015.07.002. [Each sheet of print]  
Effectiveness and safety of overnight orthokeratology with Boston XO2 high-permeability lens material: A 24 week follow-up study.  
Cheng HC\*, Liang JH\*, Lin WP\*, Wu H\*

Curr Opin Ophthalmol. 2015 Aug 3;1-6. [Each sheet of print]  
Efficacy, Safety and Acceptability of Orthokeratology on Slowing Axial Elongation in Myopic Children by Meta-Analysis.  
Li JH\*, Wang HT\*, Wu SE, Liu LR, Li H, Chen Z, Wang N.

Invest Ophthalmol Vis Sci. 2011 Jul-Aug;52(14):368-9.  
[Article in Russian]  
Rostovskaya NO, Mavrodiev OM, Rostovskaya MV.  
Abstract  
Clinical cases representing complications (refractive, infectious, and topographic) of orthokeratologic lenses (OKL) use are described. These clinical cases show that complications of OKL use can be both similar to those of routine contact correction and caused by features of mechanism of corneal refraction change as a result of OKL wear. In our opinion efficacy and safety of this option is directly depends on the correct lens fitting, patient's compliance and regular monitoring of corneal changes.

## Managing Myopia - What DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Advantages of Orthokeratology for children
  - All lens wear / care / handling done at home with parental supervision
  - No need for lenses away from the home
    - Less risk of loss of breakage
  - 24/7 vision correction and myopia control
  - No concern for vision correction during sports / swimming / activities



## Fitting Ortho-K Lenses

OPTOMETRIC  
Management  
SYMPOSIUM

## Pre-fit: First things first

OPTOMETRIC  
Management  
SYMPOSIUM

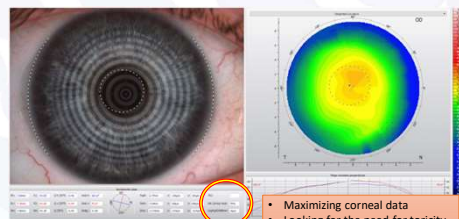
- Remember when obtaining baseline measurements, **you will never have the chance to get this data again!**
  - Get good refractive data (dry and damp / wet)
  - Get axial length measurements if you have the capability
  - Get good topographies
    - Take at least 3 per eye!



Take the time to repeat testing if needed to get the best possible data

## Good maps are crucial to good outcomes

OPTOMETRIC  
Management  
SYMPOSIUM

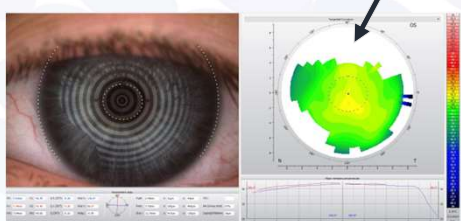


- Maximizing corneal data
- Looking for the need for toricity in the lens design

## Getting good maps

OPTOMETRIC  
Management  
SYMPOSIUM

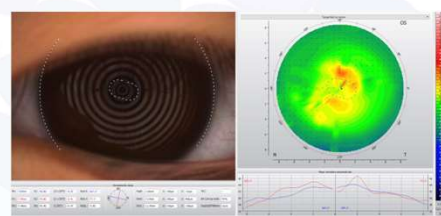
- Get maximal coverage



## Getting good maps

OPTOMETRIC  
Management  
SYMPOSIUM

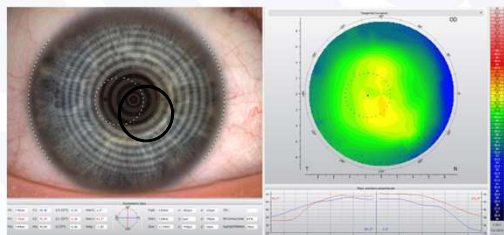
- Get Optimal Quality



## Getting good maps

OPTOMETRIC  
Management  
SYMPOSIUM

- Get correct data



## Get good maps!

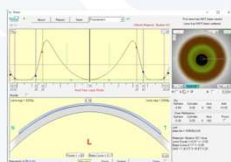
OPTOMETRIC  
Management  
SYMPOSIUM

- You need optimal maps for your baseline – so take the time to get the best scans you can get!
- If you are going to do a map based, software driven lens, the lens will only be as good as the topography you utilize
- Take the time to repeat these until you have the best possible maps

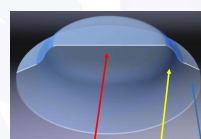


## Fitting Ortho K

- Fitting Set / Slide Rule
- Empirical order (K's, RX, HVID)
- Software Design



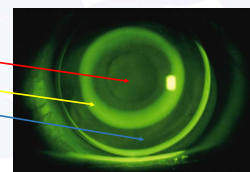
## Parts of an Ortho K lens



Base Curve

Return Zone

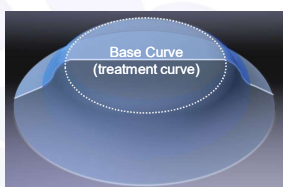
Alignment Zone



## Base Curve

The Base Curve (treatment curve) provides the "mold" for treatment.

**The Base Curve is *not* adjusted to change the fit**



## Calculating base curve

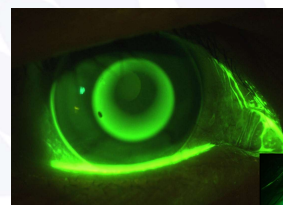
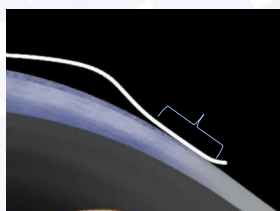
- Take patients FLAT K
- Subtract MR sphere
- Subtract Jensen Factor

- K's 44.00 x 44.50 @ 90
- MR -2.50 -50 x 180
- Jensen factor .75
- Needed BC  $44.00 - 2.50 - 0.75 = 40.75$

## Alignment Zone

### ◆ The Alignment Zone Provides the Fit and Centration

- ◆ Wider alignment will provide a better centered lens
- ◆ Wider alignment will reduce the treatment zone
- ◆ Adjust the angle of it to allow maximum surface area with the cornea



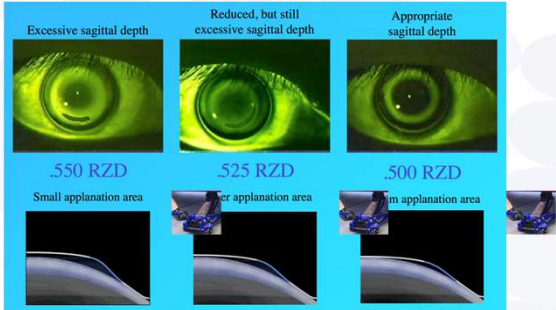
### Return Zone




• The Return Zone Controls the Application of the Treatment

- If too deep, poor application
- If too shallow, epithelial compromise and a "flat fitting" lens

### Return Zone



Excessive sagittal depth  
.550 RZD  
Small applanation area

Reduced, but still excessive sagittal depth  
.525 RZD  
Smaller applanation area

Appropriate sagittal depth  
.500 RZD  
Ideal applanation area

### Ortho-k



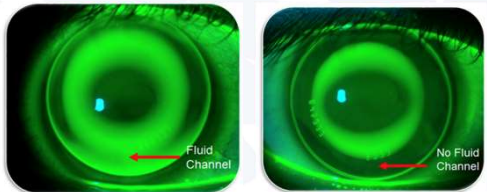
• Our Goal:

- Well positioned lens
- Over refraction plano to +.50
- Full 360 degree alignment
- Little or no corneal staining
- Uncorrected vision 20/20 (or whatever our target RX is)
- Consistent vision from morning until bedtime

Remember that this might take a few weeks to all come together depending on the patient

### Torics

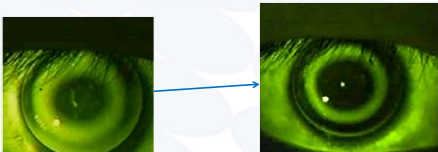
• Can add toricity to the return zone or the alignment zone to get a better, more aligned fit to the cornea



### Troubleshooting

• If Initial Diagnostic lens decenters Laterally or Superiorly:

- Increase sagittal depth in the reverse curve



### Diagnostic Dispensing

◆ If Initial Diagnostic lens decenters inferiorly:  
Decrease Sagittal Depth in either the reverse curve or the alignment zone



## Diagnostic Dispensing

OPTOMETRIC  
Management  
SYMPOSIUM

- ◆ If Initial lens centers but does not provide sufficient central applanation
- ◆ Decrease Sagittal Depth through a flatter Landing Zone or a shallower Return Zone



\*Always confirm  
centration with  
each parameter  
change



## Diagnostic Dispensing Guidelines

OPTOMETRIC  
Management  
SYMPOSIUM

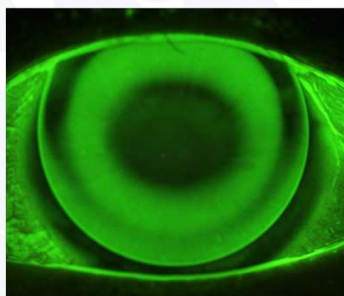
1. Centration is the primary goal



Sagittal depth can be reduced to increase  
treatment applanation at next follow-up.

Case 1

OPTOMETRIC  
Management  
SYMPOSIUM



Case 2

OPTOMETRIC  
Management  
SYMPOSIUM



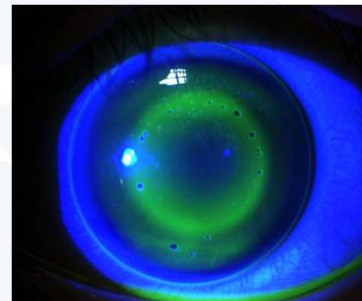
Case 3

OPTOMETRIC  
Management  
SYMPOSIUM



Case 4

OPTOMETRIC  
Management  
SYMPOSIUM

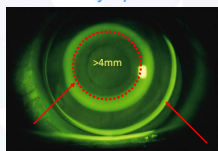


## Dispensability Summary

## Determine Initial Diagnostic Lens

- ◆ Find a lens that has:
- ◆ Centration
- ◆ 3-4mm Treatment Zone
- ◆ Moderate tear-film touch in the mid-periphery
- ◆ Adjust Edge Lift, if necessary
- ◆ Overrefract at the end to ensure proper base curve

## "Bulls-eye pattern"



Centration is the key to success

## Ortho-k follow up

- Recheck
  - Topography
  - History
  - Check unaided acuity
- Refract without contact lenses (If VA is reduced)
  - Keep in mind that the ortho K cornea is multifocal
  - Keep in mind you are refracting a child with lots of accommodative ability
  - **Be careful to NOT over minus**
- Slit lamp – check especially for corneal staining
- Evert lids, check for integrity of palpebral conjunctiva

If the VA is good and the topography indicates a well centered treatment zone, the lenses do NOT have to be placed on eye and assessed if it is just a progress check!

## If VA is reduced..

- Is it due to poor fit or wrong base curve?
- How do you know?
- Check topo and over refract lenses
- When should you need to OR lenses?
  - First week?
  - First month?
  - 3 months?
  - 6 months?
  - 1 year?

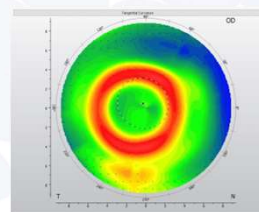
## Ortho k annual exam

- Full exam like any other child
- Topo first
- History
- VA
- Entrance Testing
- Refract without lenses
- Slit Lamp
- Place lenses on
- Check condition and fit
- Over refract
- Remove lenses and finish IOP and Dilate

## Soft Multifocal Lenses

## Managing Myopia - what DOES work

- Soft Multifocal lenses can create an optical system to provide a peripheral myopic defocus just like orthokeratology



## Managing Myopia - what DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Soft Multifocal Options
  - MiSight
  - NaturalVue
  - Biofinity / Proclear Multifocal (Center Distance)
  - Custom soft center distance multifocals
  - Coming soon – Abiliti soft lenses

## Managing Myopia - what DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

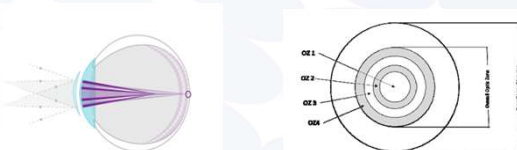
- Misight
  - Specs:
    - Single use spherical hydrogel lens
    - Proclear 1 day material
    - 8.7 BC / 14.2 Diameter
    - -0.50 to -7.00
    - Dual Focus: Distance / Near / Distance / Near zones



## Managing Myopia - what DOES work

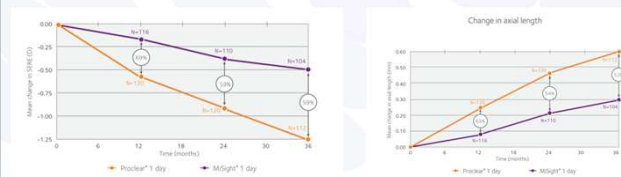
OPTOMETRIC  
Management  
SYMPOSIUM

- Misight
  - Alternating zones of power create confusion that moves an image shell into the myopic defocus zone



## Managing Myopia - what DOES work

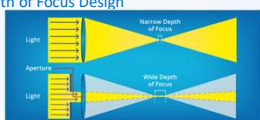
OPTOMETRIC  
Management  
SYMPOSIUM



## Managing Myopia - what DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

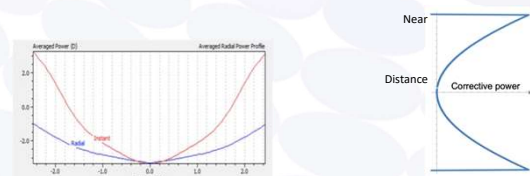
- VTI Naturalvue
  - Specs:
    - Single use spherical hydrogel lens
    - 1 day Acuvue material
    - 8.3 BC / 14.5 Diameter
    - +4.00 to -12.00
    - Center Distance / Extended Depth of Focus Design



## Managing Myopia - what DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Extended depth of focus gives distance VA in the center and up to +3.00 add in the midperiphery



## Managing Myopia - what DOES work

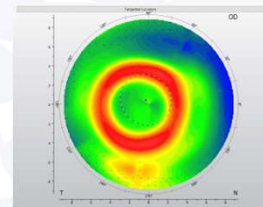
OPTOMETRIC  
Management  
SYMPOSIUM

- Custom Soft Multifocal Lenses
  - Can also be an option
    - Multiple BC and diameter options
    - Toric powers
    - Custom add powers
    - Decentered Optics
    - Custom add zone sizes
  - Only problem is replaceability (typically quarterly replacement)

## Managing Myopia - what DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Custom MF, Distance Center, BC 8.3, Diameter 14.1, power -7.50, 3.5 mm distance Zone, +5.00 Add



## Myopia Control Spectacle Lenses

OPTOMETRIC  
Management  
SYMPOSIUM

## Managing Myopia - what DOES work

OPTOMETRIC  
Management  
SYMPOSIUM

- Myopia control spectacle lenses
  - DIMS (Defocus Incorporated Multiple Segments) spectacle lens
  - Developed and tested at Hong Kong Polytechnic
  - Being manufactured and sold through Hoya as MyoSmart



## Myopia: What does work

OPTOMETRIC  
Management  
SYMPOSIUM

- Atropine
- OrthoK
- Soft Multifocals
- Myopia Control Spectacle Lenses

## Managing Myopia in YOUR Practice

OPTOMETRIC  
Management  
SYMPOSIUM



## Managing Myopia in your practice

OPTOMETRIC  
Management  
SYMPOSIUM

### • THE Discussion

- You need to start having THE discussion with parents of children that are myopic or who are going to be myopic
- Prepare them for the idea of controlling myopia as soon as possible so you can deal with it as soon as possible



## Managing Myopia in your practice

OPTOMETRIC  
Management  
SYMPOSIUM

- Children that are under the age of 6-7 should be mildly hyperopic
- If you see a 6 year old and they are plano, especially with a myopia parent, you need to have THE myopia discussion
- Parents that are myopic should understand
- If the interest is there, you can start a child on low dose atropine even before refractive error shows up, particularly when parents are moderate to high myopes

## Managing Myopia in your practice

OPTOMETRIC  
Management  
SYMPOSIUM

### • THE discussion

- Explain the risks of myopia to the ocular health long term
- Explain that intervening earlier means less risks to the ocular health in the future, more options for vision correction, and potentially safer vision correcting surgery in the future
- Explain the costs associated with these therapies
- Possible have literature ready to give out
- If you are NOT starting intervention now, prepare the parent for it in the future
- Schedule them for their next appointment appropriately
  - Might be 1 year, might be 6 months if they are 6 years old and a -0.25 already



## Managing Myopia in your practice: When its time to intervene

OPTOMETRIC  
Management  
SYMPOSIUM

### • Atropine

- When intervention is occurring prior to development of true myopic refractive error, or when refractive error is very low (-0.50 or less) atropine is a great approach
- Don't need corrective lenses so why both with them
- Often starting Atropine results in a small loss of minus - 0.50 may slip back to - 0.25, further making the use of corrective lenses unnecessary
- For the 4-7 year old that is plano and family history dictates myopia, and the parents want to intervene, this is the approach to take



## Managing Myopia in your practice: When its time to intervene

OPTOMETRIC  
Management  
SYMPOSIUM

### • Orthokeratology

- When the child has enough refractive error to consider correction (-0.75 or more) and they are young enough that the idea of giving them full time correction managed at home with parental assistance in a high / hyper DK lens worn 8 hours a day is preferable to a low DK hydrogel lens worn 14 hours a day and separate glasses when the contact lenses are not being worn, then orthokeratology is a great option
- Great for children 12 and under unless the RX is already too high or they are not interested



## Managing Myopia in your practice: When its time to intervene

OPTOMETRIC  
Management  
SYMPOSIUM

### • Soft Multifocal Lenses

- Transition out of orthokeratology as children get older
- Also for those that are new to contact lens correction and are over the age of 10
- Again, my comfort zone in putting children in full time soft lenses for myopia control is starting somewhere around 10-12
- Also for higher corrections that aren't doing well with orthokeratology



## Managing Myopia in your practice: When is the time to intervene

- Myopia control spectacle lenses
  - Not currently available in the US but expected soon
  - When available, I see them in the same place as orthokeratology - the child that needs correction but is not at an age where I feel good about them in full time low DK soft lenses



## How would you manage this patient?

- 5 year old female
- Both parents myopic
- 9 year old sister doing myopia management
- RX today:
  - OD: plano
  - OS: -0.25
- Axial length:
  - OD: 24.20 mm
  - OS: 24.34 mm

## How would you manage this patient?

- 7 year old male
- New patient to your office
- One myopic parent
- RX:
  - OD: -1.00 sph
  - OS: -1.25
- Axial length
  - OD: 23.52 mm
  - OS: 23.73 mm

## How would you manage this patient?

- 9 year old male
- Both parents myopic
- New patient
- Current spectacles(1 year old):
  - OD: -2.00-.25 x 175
  - OS: -1.75-.50 x 180
- Today's RX:
  - OD: -3.75 -.50 x 175
  - OS: -3.50 -.50 x 180
- Axial Length:
  - OD: 25.15 mm
  - OS: 25.02 mm

## How would you manage this patient?

- 13 year old female
- One parent myopic
- Current spectacles(1 year old):
  - OD: -1.75 sph
  - OS: -2.00-.25 x 180
- Today's RX:
  - OD: -2.50 sph
  - OS: -2.50 -.50 x 180
- Axial Length:
  - OD: 24.74 mm
  - OS: 24.81 mm

## Conducting a Myopia Control Exam: Considerations

## Conducting a Myopia Control Exam: Considerations

OPTOMETRIC  
Management  
SYMPOSIUM

- Do I need an optical biometer?  
• Short answer is NO.
- But if you are going to be a full scope Myopia Managing practice you SHOULD have one.
- It allows you to monitor for progression in the most accurate way, most precise way
- In cases of orthokeratology, its hard to track for change because you can't use refractive error, you have to over refract through the lenses and there is just too much variability

## Conducting a Myopia Control Exam: Considerations

OPTOMETRIC  
Management  
SYMPOSIUM

- Do everything both undilated and dilated when possible
- You need to put away accommodation as a factor in assessing baseline and progression
- So hard to control this in 5-10 year old children without some degree of cycloplegia
- 2 drops of 1% Tropicamide 5 minutes apart should suffice, but **DO IT THE SAME EVERY TIME**

## Conducting a Myopia Control Exam: Considerations

OPTOMETRIC  
Management  
SYMPOSIUM

- Set a **TARGET Axial Length** for therapy just like you would set a **TARGET IOP** in glaucoma
- Projecting out an amount of change expected over time, and initiating a therapy, you can decide at interval visits if you are meeting goals and if not you can alter therapy
- Adding a second line of treatment or increasing concentrations of Atropine, increasing add power in lenses, etc.

## Conducting a Myopia Control Exam: Considerations

OPTOMETRIC  
Management  
SYMPOSIUM

- **Setting Targets: How do I do it?**
  - Talk to parents about how aggressive they want to be
  - Use Brien Holden Vision Institute projections to determine realistic goals
  - If you are not meeting goals at follow-up consider additive therapy



## Practical Practice Considerations

OPTOMETRIC  
Management  
SYMPOSIUM

- Staff training – ALL members need to be knowledgeable in myopia management to some extent
- Assign one or two key myopia management liaisons
  - Answering parent questions, following up after I&R, keeping track of follow up appointments, lens reorders

## Global Fees?

OPTOMETRIC  
Management  
SYMPOSIUM

- Recommend a global fee for myopia management inclusive of contact lens materials
  - All follow ups included throughout the year
  - Helps to improve compliance with follow ups and wear schedule
  - Don't need to worry about running out of contacts mid-treatment
- Structure fee schedule higher year 1 and lower for subsequent years
  - Less follow ups and chair time, no I&R

## Myopia Management Contracts

OPTOMETRIC  
Management  
SYMPOSIUM

- Give contract to parents at time of consultation specific to option you are prescribing
- Spell out fee schedule for year 1 and subsequent years
- Discuss lens warranties and lost/broken lens policies
- Follow up schedule – and potential for refit fee if patient is over 15 months from previous exam
  - Avoids patients that wait until vision worsens or corneas warp resulting in a brand new refit and wash out period
- Risk of contact lens wears – especially with young patients

## Final Thoughts

OPTOMETRIC  
Management  
SYMPOSIUM

- Don't forget about recommending outdoor time
- Breaks from near work
- Setting up proper workstations with plenty of moderate to bright light



## Final Thoughts

OPTOMETRIC  
Management  
SYMPOSIUM

- This is medical optometry:
  - We are managing axial length growth and the associated ocular health complications, not myopia per se
  - Treat this just like you would any other medical optometry aspect of your practice
  - Invest in some equipment when you can to make your practice state of the art



## Final Thoughts

OPTOMETRIC  
Management  
SYMPOSIUM

- Charge appropriate fees and escape managed care control
- Take the time now while you are away from the office to consider how to implement myopia management in your practice when you get back
  - Get your fees set
  - Get your protocols set
  - Consent forms if you like
  - Prepare your staff
  - Come up with a short term and long term plan that includes the equipment you want in the long run

## Questions?

OPTOMETRIC  
Management  
SYMPOSIUM

- [jajedlic@Indiana.edu](mailto:jajedlic@Indiana.edu)
- [drkuzniar@elevateeyemi.com](mailto:drkuzniar@elevateeyemi.com)

