

# Treatments Showdown: What Myopia Control Option Would You Choose?

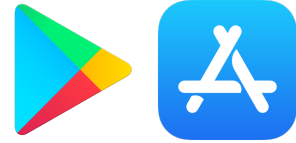
**Moderator:** Jeffrey J. Walline, OD PhD  
**Orthokeratology:** Ashley Wallace-Tucker, OD  
**Spectacles:** Pauline Cho, BOptom MEd PhD  
**Soft Contact Lenses:** Kate Gifford, PhD BAppSc(Optom)Hons  
**Atropine:** Sally Dillehay, OD EdD

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## Download the App

- To participate in polls used during this lecture
- Search 'PentaVision Conferences' and download app



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## Ashley Wallace-Tucker, OD, FAAO, FSLs

- Private Practice Owner
  - Bellaire Family Eye Care
  - Contact Lens Institute of Houston
- Adjunct Faculty
  - University of Houston College of Optometry
- B.S.
  - University of Florida
- O.D.
  - University of Houston College of Optometry
- Fit over 500 patients in ortho-k



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## Pauline Cho, BOptom MEd PhD

- Visiting Professor
  - West China School of Medicine/West China Hospital
- Sichuan University
- BOptom: University New South Wales, AU
- PhD University of Bradford, UK
- 200 peer-reviewed papers
  - Orthokeratology



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## Kate Gifford, PhD, BAppSc(Optom)Hons

- Clinical Optometrist since 2003 and Private Practice Owner (2007-2019)
- Visiting Research Fellow at Queensland University of Technology (QUT), Brisbane, Australia
  - BAppSc(Optom)Hons 2003, Ophthalmic Medicines Prescribing 2006, PhD 2018
- Professional leadership
  - National President of Optometry Australia (2014-2016)
  - Chair of IMI Clinical Management Guidelines Committee
- 80+ professional and peer-reviewed publications
- 160+ conference lectures given
- Co-founder of Myopia Profile



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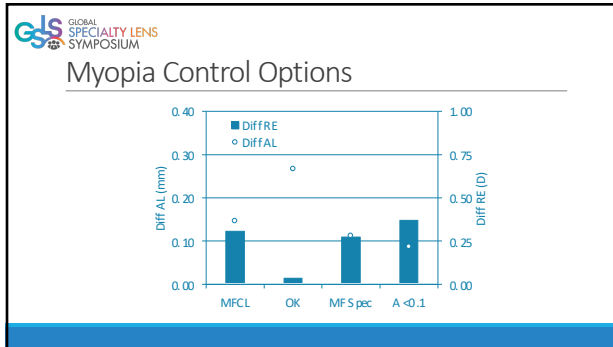


## Sally Dillehay, OD EdD

- President, ClinTrialSolutions, LLC
- 35 years of research in myopia
- OD, MS: The Ohio State University
- EdD: Nova Southeastern University
- 90 peer-reviewed publications
  - Myopia, Contact Lenses, Spectacles, Ophthalmic pharmaceuticals
- Lectured in 6 of the 7 continents
- Disclosures: Consultant to Hoya Vision Care, Kubota Vision, Visioneering Technologies, Inc



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GLOBAL SPECIALTY LENS SYMPOSIUM

### Case 1

2 year old male

**Refraction**

- OD: -2.75 -0.50 X 170
- OS: -3.00 -0.25 X 010

**Keratometry**

- OD: 43.50 / 44.50 @ 080
- OS: 43.25 / 44.00 @ 100

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GLOBAL SPECIALTY LENS SYMPOSIUM

### Case 1: Orthokeratology

- Due to young age, ortho-k is ideal myopia management option
  - Parents will be in complete control of insertion, removal and handling of lenses
- Spectacle Rx and keratometry values well within range for successful orthokeratology fit
  - Toric Ortho-K designs available to accommodate corneal toricity
    - OD: -1.00D cyl
    - OS: -0.75D cyl
- Patient will be free from daytime correction
  - No battling with child to wear spectacles
  - No need to replace broken glasses...multiple times
  - No irritants from daytime contact lens wear

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GLOBAL SPECIALTY LENS SYMPOSIUM

### Case 1: Atropine

**Evaluation:**

More D than years (very young onset); Ethnicity; Parental myopia

Compliance not likely with any type of CL

Compliance with glasses likely, but limited options for such high risk

Atropine easiest for child and parents – Good compliance and vision

**Plan:**

Consult with Peds and Genetic testing

RX: 0.1% Atropine QD OU 7D/wk

- Younger age responds less to Atropine

Spectacles: PAL + Transitions FT wear

RTC: 1M, 3M, 6M – Check BV status throughout

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### Case 1: Soft Contact Lenses

<ul style="list-style-type: none"> <li>✓ Child needs vision correction</li> <li>✓ Full-time visual stimulus</li> <li>✓ Full parental oversight possible</li> <li>✓ Minimal astigmatism</li> </ul>	<ul style="list-style-type: none"> <li>✗ More difficult modality than spectacles or atropine</li> <li>✗ Parental handling challenges could lead to extended wear</li> <li>✗ No data on efficacy at this age</li> </ul>
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Undercorrect by 0.50-1.0D until age 4 for emmetropization (Leat 2011)

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### Case 1: Spectacles

- Child is only 2 yo and already a moderate myope
- Research has shown that myopia progresses fastest when young
- MC Glasses
  - Effective MC; Less expensive than other options
  - Easy – prescribe, use, adapt, replace if lost or damage
  - Safe → no issue with overwear, non compliance with care procedures and no adverse effects
  - No need for daily maintenance/care or parental responsibilities
- Child only 2 yo
  - CL options: Heavy responsibility to ensure strict compliance with use and care
  - Atropine: 14 years of application of mydriatic drug!

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## Case 1: Poll



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## Case 2

9 year old male


**Refraction**

- OD: -1.75 DS
- OS: -1.50 -0.25 X 180

**Keratometry**

- OD: 43.25 / 43.50 @ 080
- OS: 43.00 / 43.50 @ 100

Hates the idea of anything touching the eyes



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## Case 2: Spectacles


- Low myope; dislike the idea of touching his eyes
- MC specs
  - Shown to be effective for MC
  - Non-invasive (No touch compared with CL & atropine)
  - Low myope, so specs cosmetically OK
  - Don't have to wear all the time → Can remove when not needed for near activities or non-visually demanding activities
  - No/low motivation to wear CL/atropine
  - No maintenance or daily care procedures or frequent aftercare
  - No risk (CL- or atropine-related)

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## Case 2: Soft Contact Lenses

- ✓ SCLs provide both myopia correction and management
- ✓ Easier pathway to CL wear than OrthoK
- ✓ Benefits of CL wear for kids
- ✓ Efficacy of treatment known for age
- ✓ Minimal astigmatism
- ✗ Handling / willingness to wear could impact compliance




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## Case 2: Orthokeratology

- Excellent age to teach responsibility and courage especially in regard to something that will affect his long-term eye health
- Freedom from daytime correction
  - Increase confidence
  - Improve self image
- Ideal spectacle Rx and keratometry values for successful orthokeratology fit



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## Case 2: Atropine

**Evaluation:**

Young age; Male; Ethnicity

Compliance not likely with any type of CL

Compliance with glasses may be spotty

Atropine easy for the child and parents


Atropine meets child's needs and request – Good Compliance and Vision

**Plan:**

RX: 0.05% Atropine QD OU 7D/wk

Spectacles: PAL + Transitions FT wear due to light complexion


RTC: 1M, Possibly 3M depending on progression rate, 6M



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## Case 2: Poll



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## Case 3


11 year old female

**Refraction**

- OD: -1.00 -1.50 X 170
- OS: -1.25 -1.25 X 010

**Keratometry**

- OD: 43.50 / 45.50 @ 080
- OS: 43.25 / 45.00 @ 100



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## Case 3: Atropine

**Evaluation:**

Young age; Female; Ethnicity?, Parental myopia?  
Compliance not likely with any type of CL, especially "snowflake" toric lenses!  
Compliance with glasses may be spotty as she can squint when needed  
Atropine easy for the child and parents  
Atropine meets child's needs – Good compliance and vision

**Plan:**

RX: 0.025% Atropine QD OU 7D/wk  
Spectacles: SV unless issue with glare/halos then PAL + Transitions FT wear  
RTC: 1M, Possibly 3M depending on progression rate, 6M



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## Case 3: Spectacles

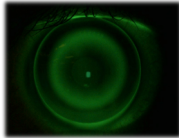
- MC SCL
  - Toric lenses not available
  - Non-compliance → complications
  - Regular/frequent AC required
- MC glasses better option
  - Better vision; Non-invasive, No need for daily maintenance/care, no issue with non compliance which increases risk of ocular complications, no need for regular AC, hence save time for both parents and ECP, Less expensive than other options
- Again, as stated before, they are Easy to prescribe, use, adapt, replace if lost or damage
- Atropine
  - Adverse effects such as allergy, blur near vision, photophobia have been reported
  - Many years of the drugs

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## Case 3: Orthokeratology

- Although initial inspection of spectacle Rx and keratometry values doesn't seem ideal, custom toric ortho-k lenses can be designed for this patient
  - corneal and refractive cylinder similar
- Teaches the child responsibility and benefits of following a routine
- Freedom from daytime correction
  - Increase confidence
  - Improve self image
- Better consistency of visual acuity compared to daytime contact lens options




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## Case 3: Soft Contact Lenses


- ✓ SCLs provide both myopia correction and management
- ✓ Benefits of CL wear for kids
- ✗ Astigmatism: toric MFCL or spherical MCCL with over-specs
- ✗ No efficacy data on toric MFCLs



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### Case 3: Poll



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### Case 4


11 year old male

**Refraction**

- OD: +0.25 -0.50 X 180
- OS: -2.25 -0.25 X 180

**Keratometry**

- OD: 43.50 / 44.50 @ 090
- OS: 43.25 / 44.00 @ 090




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### Case 4: Soft Contact Lenses

- ✓ SCLs provide both myopia correction and management
- ✓ Comfort in unilateral CL wear
- ✓ CLs ideal for anisometropia
- ✓ Benefits of CL wear for kids
- ✓ Efficacy known in this age group
- ✓ Minimal astigmatism
- ✓ Easy to start wear in OD if/when needed

✗ Potential comfort difference felt during daytime SCL wear




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### Case 4: Orthokeratology

- Excellent candidate for orthokeratology OS based on spectacle Rx and keratometry values
  - Custom toric lens available – OD 1.00D cyl, OS 0.75D cyl
  - Watch OD very closely – may become myopic at some point
- No anisometric visual effects
- Teaches child responsibility and benefits of following a routine
- Freedom from daytime correction
  - Increase confidence
  - Improve self image
  - No nuisance of wearing just one contact



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### Case 4: Spectacles

- Anisometropia
- Can see well without correction
- Poor motivation to wear ortho-k & MC SCL in one eye only
- Atropine? One eye or both eyes?
- Potential problems
  - Comparison of ocular comfort between eye with and without CL/atropine
  - Parental monitoring necessary
  - May forget to remove SCL, overwear, napping etc.
  - Ocular adverse events (CL, atropine)
  - AC
- MC spectacles
  - Special MC lens design for both eyes; Convenient; Easy to use/adapt; Relatively cheaper

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### Case 4: Atropine

**Evaluation:**

Young age; Male; Ethnicity?, Parental myopia?, Anisometropia of 2.50D

Compliance not likely with any type of CL for OD

Compliance with glasses may be spotty as perfect "Distance/Near" correction

Atropine easy for the child and parents


Atropine meets child's needs – Good compliance and vision

**Plan:**

RX: 0.025% Atropine QD OU 7D/wk

Spectacles: SV unless issue with glare/halos then PAL + Transitions FT wear


RTC: 1M, possible 3M depending on progression rate, 6M – Monitor BV status and check ergonomics



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## Case 4: Poll



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## Case 5


6 year old male

**Refraction**

- OD: +0.25 DS
- OS: plano DS

**Keratometry**

- OD: 42.50 / 43.00 @ 090
- OS: 42.25 / 42.75 @ 090



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## Case 5: Spectacles

- **Convenient**
  - Can take off any time eg. during sports, as child can see clearly without correction
  - Relatively cheaper option in case child refused intervention
  - No need for daily care and maintenance (by parents)
- **SCL**
  - Not practical, relatively more expensive
  - No motivation to wear; Effectiveness for pre-myopes unknown
  - Discomfort/dryness & parents not around to help
  - Other CL-relative adverse events
- **Atropine & Ortho-k**
  - Effectiveness for pre-myopes unknown; Relatively more expensive
  - Low motivation; Potential adverse events

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## Case 5: Atropine

**Evaluation:**

Young age and headed to myopia; Male; Ethnicity?, Parental myopia?

Compliance not likely with any type of CL as vision Cx not required

Compliance with glasses not likely as vision Cx not required

Atropine evidence for prevention

Atropine easy for the child and parents

Atropine meets child's needs

"Less screen time, more green time" not likely to happen!!!


**Plan:**

RX: 0.025% Atropine QD OU 7D/wk

- Atropine works less in younger ages, but 0.05% would most likely require spectacles

Spectacles: SV unless issue with glare/halos then PAL + Transitions FT wear

RTC: 1M, 6M - Monitor for allergies/vernal conjunctivitis




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## Case 5: Orthokeratology

- Wait a few years...
- Lower hyperopia than would like for his age thus trending towards myopia



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## Case 5: Soft Contact Lenses

It's useful to mention myopia control treatments for familiarization in pre-myopes

✗ No vision correction needed


✗ No data on pre-myopia efficacy



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## Case 5: Poll



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## Case 6

10 year old female

**Refraction**


- OD: -1.75 DS
- OS: -1.50 DS

**Keratometry**

- OD: 45.50 / 46.00 @ 090
- OS: 45.25 / 45.75 @ 090

Patient likes wearing glasses

Wants contact lenses for dance and softball only




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## Case 6: Orthokeratology

- Excellent candidate based on spectacle Rx and keratometry values
- Freedom from daytime vision correction
  - Can buy inexpensive plano spectacles and change them up more frequently!
- No need to worry about daytime contact lens irritants especially during sports activities



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## Case 6: Atropine

**Evaluation:**

Young age; Female; Parental myopia?, Steepish K's

Atropine easy for the child and parents

Atropine meets child's needs and requests - Good compliance and vision


**Plan:**

RX: 0.025% Atropine QD OU 7D/wk

Spectacles: SV unless issue with glare/halos then PAL + Transitions FT wear

DD CLs for dance and softball

RTC: 1M, Fit for CLs, possibly 3M depending on progression rate, 6M



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## Case 6: Spectacles

- Low myope, so glasses not thick or heavy
- Child likes to wear glasses
- Convenient
  - Can remove when not needed for near activities or non-visually demanding activities
  - Safer for child as no issue with CL or atropine-related adverse events or overwear or nap with CL
- Can wear daily disposable contact lenses for dance (low myopia may not need vision correction) & softball

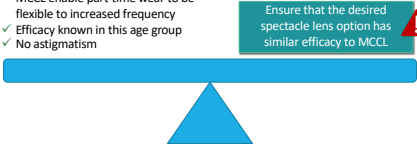
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## Case 6: Soft Contact Lenses

- ✓ SCLs provide both myopia correction and management
- ✓ Benefits of CL wear for kids
- ✓ MCCL enable part-time wear to be flexible to increased frequency
- ✓ Efficacy known in this age group
- ✓ No astigmatism


Ensure that the desired spectacle lens option has similar efficacy to MCCL



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## Case 6: Poll



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## Case 7

12 year old female


**Refraction**

- OD: -7.75 DS
- OS: -8.50 DS

**Keratometry**

- OD: 45.50 / 46.00 @ 090
- OS: 45.25 / 45.75 @ 090

Competitive athlete




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## Case 7: Soft Contact Lenses

- ✓ SCLs provide both myopia correction and management
- ✓ Benefits of CL wear for kids: athletics
- ✓ Immediate full acuity achieved
- ✓ Better vision & function with CLs
- ✓ CLs most suitable option for sport
- ✓ Known efficacy in this age group
- ✗ Lens availability in high myopia
- ✗ No efficacy data on commercially available options over -5.00 or -6.00



1: Walline et al 2020, 2: Walline et al 2013

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## Case 7: Spectacles

- Ortho-k
  - Only 1 brand available? Partial reduction possible, but involves wearing glasses in the daytime
  - Fluctuations of vision (eg if lens decentred the night before)
- Ortho-k and atropine
  - CL- or atropine-related adverse events or overwear/nap with CL
- Convenient
  - Can remove and wear DDSCL when playing sports (reducing CL-related problems)
- Atropine
  - 0.01% atropine not effective in slowing AE!
  - may have problems with glare or halos due to increase pupil size which can affect her sport performance

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## Case 7: Atropine

**Evaluation:**

Young age; Female; Parental myopia?, Steepish K's, very high Rx, anisometropia of almost 1D

Atropine easy for the child and parents as already wears glasses

Atropine meets child's needs and requests – Good compliance and vision


**Plan:**

RX: 0.05% Atropine QD OU 7D/wk

Spectacles: PAL + Transitions FT wear

DD CLs for athletics with sport safety glasses

RTC: 1M, Fit for CLs, 3M check [ATR], 6M




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## Case 7: Orthokeratology

- More challenging orthokeratology fit based on high spectacle Rx but it CAN be done
  - May not be able to get full Rx with orthokeratology lenses alone
  - Consider combo treatment
- Potential for better quality of vision compared to specs
- Freedom from daytime correction
  - Especially important for athletes
  - No risk of glasses breaking or daytime contact lens issues during game time
- Excellent age to take this responsibility on her own




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Case 7: Poll

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Summary

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