Controversies in Contact Lens Care

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Question 1

- What myopia control method do you prescribe most often? (Jeff W)
  1. Bifocal/Multifocal spectacles
  2. Gas permeable contact lenses
  3. Orthokeratology
  4. Soft bifocal contact lenses
  5. Atropine

Myopia Control Summary

Bifocal / PAL Undercorrection  
Atropine

Pirenzepine

Orthokeratology

Soft Bifocal

42% 46% 59%

Lam CS, et al., BJÖ 2014;98:40-5

Soft Bifocal Myopia Control

Orthokeratology Myopia Control

Chang et al., [mm] (5th, 75th, 975th)

Lam CS, et al., BJÖ 2014;98:40-5

Myopia Control Summary

Orthokeratology Myopia Control

0.01% Atropine Myopia Control


- Accommodative (D) 0.01%: ±4.6, 0.1%: ±10.1, 0.5%: ±11.8
- Pupil (mm): 0.01%: 1.15, 0.1%: 2.71, 0.5%: 3.56
- Pupil (photo, mm): 0.01%: 0.75, 0.1%: 2.24, 0.5%: 3.11
- Distance VA (logMAR): 0.01%: -0.02, 0.1%: +0.01, 0.5%: -0.01
- Near VA (logMAR): 0.01%: -0.02, 0.1%: +0.06, 0.5%: +0.25
- Reading specs (% yes): 0.01%: 6, 0.1%: 61, 0.5%: 70


Question 2

- Do you recommend that patients rub the case daily? (Jeff W)
  1. Yes
  2. No

Case Care as Risk Factor for MK

- Poor case hygiene (not air dry) and all MK
  - Odds ratio = 3.7 (1.8-7.8)
- Poor case hygiene and moderate to severe MK
  - Odds ratio = 6.4 (1.3-31.7)
- Elimination of moderate and severe MK
  - 50% by air drying case
  - 27% by frequent storage case replacement
  - 62% by combination


Case Contamination

- Written and verbal instructions (Group 1) significantly reduced the rate of case contamination compared to verbal only
  - 13% still used tap water

Tilia D, et al. OVS 2014;91:262-71
To Rub or Not to Rub?

No clean  Rinse  Air dry  Rub  Rinse  Air dry  Rub  Rinse  Air dry  Rub  Rinse  Tissue  Air dry

Wu YT, et al. IOVS 2011;52:5287-92

CL Case Care

• Immediately after lens insertion
  — Discard old solution
  — Rub case with clean fingers (5 sec)
  — Fill case 80% and pour out
  — Wipe dry with tissue
  — Store upside down with lid off

Wu YT, et al. IOVS 2011;52:5287-92

To Rub or Not to Rub?

Wu YT, et al. IOVS 2011;52:5287-92

Contact Lens Safety: Case Care

• Most asked question on ContactLensSafety.org:
  “How should I clean my contact lens case?”

How Air Dry?

• Face down
  — Location not important if face down

Wu YT, et al. IOVS 2011;52:5287-92
Question 3

• How often do you tell your patients to replace their contact lens case? (Tom)
  1. Monthly
  2. Every three months
  3. Every six months
  4. Annually
  5. I don’t recommend a replacement schedule

How often to replace the case?

• 3 month vs 6 months or more
  – Every 3 months safer
  – risk of mod/severe MK by 5.4 times


Question 4

• What contact lens replacement schedule do you prescribe most? (Shalu)
  1. Daily
  2. Biweekly
  3. Monthly
  4. Annual

Question 5

• What material do you think is safest for patients to wear? (Randy)
  1. Hydrogel
  2. Silicone hydrogel

How often to replace the case?

• Cases may develop significant contamination after two weeks!
• Suggests monthly replacement is advisable

Lakkis C. et al. Time course of the development of contact lens case and contact lens contamination. ARVO, 2009
Question 6
• When prescribing contact lenses do you consider UV protection? (Shalu)
  1. I never consider UV protection
  2. I occasionally consider UV protection
  3. I usually consider UV protection
  4. I always prescribe contact lenses with UV protection

The Case of the Occasional Wearer
• Case contamination rate: 30-85% 1-6


Question 7
• Do you pair specific contacts and solutions when prescribing? (Randy)
  1. I always recommend the same solution
  2. I don’t consider the lens/solution combination
  3. I pair the same company solution with the same contact lens brand
  4. I pair based on the Andrasko staining grid

The Case of the Occasional Wearer
• Case contamination rate: 30-85%
  • Case bacterial biofilm resistance
    – Easily removed initially
    – Significantly more resistant over time


Question 8
• When do you recommend a part-time contact lens wearer dispose of 30-day lenses? (Tom)
  1. 30 days after foil pack is first opened
  2. After 30 days of actual wear
  3. I refit all patients who wear their lenses occasionally into daily disposables

The Case of the Occasional Wearer
• Case contamination rate: 30-85%
  • Case bacterial biofilm resistance
  • Effect of disinfecting soln with time

The Case of the Occasional Wearer

- Case contamination rate: 30-85%
- Case bacterial biofilm resistance
- Effect of disinfecting soln with time
- Evidence of case contamination @ 2 wks

Lakkis C, et al. Time course of the development of contact lens case and contact lens contamination. ARVO, 2009

Refit to Daily Disposable Lenses

-12.5x lower risk vs reusable lenses


Question 9

- Surveyed compliance rates with recommended replacement schedule (2,147 respondents):
  2WR (34%), DD (74%), 1MR (67%)

- Compliance study in Japan- Most frequent lens type prescribed 2WR (32.1%) and DD (31.0%)-
  42.7% of DD and 2WR patients adhere to recommended replacement schedule

Question 10

- In my practice I fit full scleral lenses (>16.0mm) (Jeff S)
  1. Not at all
  2. Only for irregular cornea patients
  3. For irregular cornea, and healthy astigmatic single vision patients
  4. For irregular cornea, healthy astigmatic, and presbyopic patients
Question 11

- The average number of visits it takes me to fit a full scleral lens (>16.0mm) is: (Jeff S)
  1. 1-2
  2. 2-3
  3. 3-5
  4. 6-8

- Retrospective case series at Mayo Clinic on patients with ocular surface disease - Average 3 visits - range 2-6

Question 12

- The healthiest (least infections and other complications requiring temporary discontinuation of lens wear) form of contact lens is: (Ed)
  1. Silicone-hydrogel monthly replacement daily wear
  2. Hydrogel monthly replacement daily wear
  3. Daily disposable
  4. Rigid gas permeable (GP)

### Annualized incidence of MK (courtesy of Loretta Szczotka-Flynn OD, PhD)

<table>
<thead>
<tr>
<th>Study Location</th>
<th>Year</th>
<th>Lens Type</th>
<th>Annualized Incidence per 10,000 wearers Daily non-overnight</th>
<th>Annualized Incidence per 10,000 wearers Extended overnight</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>1993</td>
<td>Conventional Low Dk</td>
<td>4.1</td>
<td>20.9</td>
</tr>
<tr>
<td>Holland</td>
<td>1999</td>
<td>Conventional and Disposable Low Dk</td>
<td>3.5</td>
<td>20.0</td>
</tr>
<tr>
<td>West of Scotland</td>
<td>1999</td>
<td>Conventional and Disposable Low Dk</td>
<td>2.7</td>
<td>Not available</td>
</tr>
<tr>
<td>US</td>
<td>00-04</td>
<td>Lotrafilcon A</td>
<td>Not available</td>
<td>18</td>
</tr>
<tr>
<td>Australia</td>
<td>03-04</td>
<td>Low Dk soft Si Hy</td>
<td>2.6</td>
<td>19.5</td>
</tr>
</tbody>
</table>

### Crude Incidence for MK per 10,000 wearers (Stapleton et al 2008)

<table>
<thead>
<tr>
<th>Lens Type</th>
<th>Any MK</th>
<th>Severe MK</th>
<th>VA loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Wear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGP DW</td>
<td>1.2</td>
<td>1.2</td>
<td>0</td>
</tr>
<tr>
<td>DW soft</td>
<td>1.9</td>
<td>1.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Daily Disp.</td>
<td>2.0</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>DW Si-Hy</td>
<td>11.9</td>
<td>8.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Overnight Wear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EW soft</td>
<td>19.5</td>
<td>13.3</td>
<td>4.0</td>
</tr>
<tr>
<td>SH soft</td>
<td>25.4</td>
<td>16.9</td>
<td>2.8</td>
</tr>
<tr>
<td>ANY</td>
<td>4.2</td>
<td>2.7</td>
<td>0.6</td>
</tr>
</tbody>
</table>

13.9 % of MK results in loss of VA
GP LENSES

- Advantages in quality of vision and eye health

DAILY DISPOSABLE LENSES

- Use increasing: 15%(US), 29% worldwide(1) due to health benefits(1,2)
- Minimize/eliminate ON wear complications, little deposit-buildup problems; solution toxicity & case contamination

SILICONE HYDROGEL LENSES

- Increase O2 transmission 3 – 5 times
- Not reduced risk of eye infection, notably with EW (1,2)
- However, less corneal swelling and appear to be a healthier option (3)

Question 13

- For a spherical soft lens wearer who is now presbyopic, which option do you prefer: (Ed)
  1. Monovision
  2. Over-spectacles for reading
  3. Soft multifocal
  4. GP multifocal

2013 Annual Report (Nichols J, CLS 1/14)

- Survey via Jeff Johnson OD (Vice-President, Robert W. Baird & Co.)
- For presbyopes wearing CLs, practitioner preference was:
  - Multifocal lenses: 72% (59% in 2008)
  - Monovision: 19% (27% in 2008)
  - Over-spectacles: 8% (14% in 2008)
- "...new technologies in multifocal lens designs would lead to the slight rise in fitting multifocal contact lenses compared to monovision. . ."

Monovision Versus Soft Contact Lens Bifocals/Multifocals Part I

- 68 – 76% preferred multifocals
- Kirschen, Hung & Nakano (OVS, Dec., 1999): improved stereoaucity, visual acuity and binocularity with Acuvue Bifocal (versus monovision)
- Situ (ECL, 2003) refit 50 monovision wearers into the Acuvue Bifocal
  - 40 completed 6 month study
  - Low & high contrast visual performance equal
  - 68% preferred bifocal, 28% preferred monovision
Monovision Versus Soft Contact Lens Multifocals: Part II

- Richdale, Lynn & Zadnik (OVS, May, 2006)
- Binocular high contrast acuity at distance and near: both 20/20
- Slight loss at both distances under low contrast (near loss 5-6 letters with MF; 2 letters with MV)
- 79 second decrement in stereoacuity with MV
- 76% preferred Soflens Multifocal; 24% monovision

Monovision: Suppression & Anisometropia

- Monocular suppression of blur as add increases
- Contrast sensitivity loss & compromise on critical vision tasks
- An increase in anisometropia of ≥ 0.50D (1.25D maximum) in 29% of monovision wearers (Jain S, et al, Surv Ophthalmol, 1996)

Monovision vs. Soft Multifocals: Part III
(Benjamin WJ, Contact Lens Spectrum, 7/07)

- Compared ProclearMF to Proclear monovision
- 46 subjects completed the study
- 32 chose MF, 14 chose MV (2.28 to 1 ratio)
- Almost 70% preference for multifocals
- Vision assessed 2.7-5.8% higher for MF for dist., near and overall vision

Monovision Versus Soft Bifocals Lenses: Part IV (Paulo RB et al, OVS, 3/13)

- 20 subject crossover study
- Concluded that multifocal wear had comparable VA to monovision wear without compromising stereoacuity
- With multifocal wear an improvement in vision was observed from 1 to 15 days which suggested an adaptation effect which was not evident with monovision wear
- Bottom Line: Multifocal lenses can potentially provide a better balance of real-world visual function because of minimal binocular disruption compared with monovision.