Clinical Indications for Custom Soft Contact Lenses

Large commercial companies producing a wide range of lens powers only, in a monthly replacement modality.

Smaller laboratories producing a limited range of custom lens parameters (base curve, powers and diameters) in a monthly replacement modality.

Smaller laboratories producing an entirely custom soft contact lenses in a quarterly replacement modality.

Patient’s RX: -14.00 -0.75 x 180
K’s: 43.00 (7.85) @ 180 44.00 (7.65) @ 90
HVID: 11.8 mm

If the Sagittal Depth and HVID are NORMAL

Cooper Vision
Biofinity and Biofinity XR
Molded Si-Hy, Dk 128,
Monthly Replacement

Base Curve: 8.6
Powers: -0.50 to -20.00 D.
+0.50 to +15.00 D.
Cylinder: -0.75 to -5.75 D.
Diameter: 14.0 mm

Patient’s RX: -14.00 -0.75 x 180
K’s: 43.00 (7.85) @ 180 44.00 (7.65) @ 90
HVID: 12.6 mm
Custom Soft Contact Lenses

- Large commercial companies producing a wide range of lens powers only, in a monthly replacement modality.
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- Smaller laboratories producing an entirely custom soft contact lenses in a quarterly replacement modality.

Avanti Lens / Ultravision UK

**Monthly Disposable SiHy SCL**

**PARAMETER RANGE**
- Base curve: 8.00, 8.30, 8.60, 8.90, 9.20
- Diameter: 14.00, 14.50, 15.00
- Sphere: +1.00 to +7.00
- cyl: -3.00 to -0.00
- Axis: 1-180 (1° increments)
- Multifocal centre distance and centre near
- Add: +0.50 to +4.00

**EASY TO ORDER**
- Call or e-mail with HVD, K readings & Spectacle FAA to receive your diagnostic lenses.

**Free Trial Lenses**

- **Small** 11.3 or Smaller
- **Medium** 11.4 to 12.2
- **Large** 12.3 or Larger

**Base Curve Radius**

- 0.3, 0.2 mm or Single Increments
- **Overall Lens Diameter = 14.0 mm**

- **Steep Base Curve =** 8.40 mm
- **Med. Base Curve =** 8.60 mm
- **Flat Base Curve =** 8.80 mm
- **Steep Base Curve =** 8.40 mm
- **Flat Base Curve =** 8.60 mm
- **Med. Base Curve =** 8.40 mm

**In the US**

- **37.6 million CL Wearers**
- **3.2 million Begin (New Fits)**
- **2.8 million Depart (DC CL’s)**

**Reason**

- Comfort: 42%
- Presbyopia: 18%
- Expense: 17%
- Acuity: 15%
- Complications: 8%
- Total: 100%

- Too Large
- Too Small

- 37.6 million CL Wearers
- 3.2 million Begin (New Fits)
- 2.8 million Depart (DC CL’s)

- 1/23/2017
Fitting by Sagittal Depth

Five Anatomical Features that Contribute to the Sagittal Height of the Anterior Eye

1. Central Corneal Curvature
2. Corneal "E"
3. Corneal Diameter
4. Scleral Sag
5. Corneal Angle

Which anatomical feature has the GREATEST contribution to the sagittal height of the cornea?

1. Central Radius “K”
2. Corneal Eccentricity
3. **Corneal Diameter**
4. Scleral Sag
5. Corneal Angle

Measuring Corneal Diameter

Corneal Diameter or Visible Iris Diameter???

- Clear Cornea
  - HVID = 11.8 mm
  - Corneal Diameter = 12.8 mm

Vertical Measurement Gauge

- Large > 12.2 mm
- Normal 11.4 to 12.2
- Small < 11.4 mm
HVID Distribution (300 Consecutive Eyes)
23.3% Outside Normal Diameter Range

Number of Eyes

<table>
<thead>
<tr>
<th>Diameter</th>
<th>10.9</th>
<th>11.1</th>
<th>11.3</th>
<th>11.5</th>
<th>11.7</th>
<th>11.9</th>
<th>12.1</th>
<th>12.3</th>
<th>12.5</th>
<th>12.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>6</td>
<td>11</td>
<td>15</td>
<td>19</td>
<td>43</td>
<td>58</td>
<td>65</td>
<td>20</td>
<td>2</td>
<td>32</td>
</tr>
</tbody>
</table>

Horizontal Visible Iris Diameter

---

Corneal / Lens Diameter

1.25 mm of Scleral Drape
HVID 11.8 mm, Lens Dia. 14.3 mm

Corneal / Lens Diameter

1.25 mm of Scleral Drape
HVID 11.2 mm, Lens Dia. 13.7 mm

Corneal / Lens Diameter

1.25 mm of Scleral Drape
HVID 12.4 mm, Lens Dia. 14.9 mm

Corneal Diameter

10.2 mm HVID
Apical Radius:
46.00 D 7.34 mm

13.0 mm HVID
Apical Radius:
41.00 D 8.23 mm
Patient KS Small Diameter Cornea
HVID 11.3 mm Acuvue Oasys 14.0

If you desire a soft contact lens with the following parameters:

- BC: 8.6 mm
- Power: -3.00 D.
- Diameter: 14.5 mm

Dry
- 6.07 mm
- 48.00 D.
- -2.04 D.
- 9.93 mm
- 0.09
- 1.497
- 65%

Wet
- 8.60 mm
- 39.25 D.
- -3.00 D.
- 14.5 mm
- 0.13
- 1.401
- 65%

Arc Length Contact Lens Calculator
Patient KS Small Diameter Cornea
HVID 11.3 mm Custom SCL

Right Eye: 13.06 mm
Left Eye: 13.04 mm
HVID 13.0 mm + 3.00 Scleral Drape = 16.0 mm

Professional Basketball Player

Arc Length Contact Lens Calculator

CR 14.0 mm SCL Design
Right Eye

Sagittal Depth of a Contact Lens

Sagittal Height
Base Curve
Overall Diameter
CR Custom 14.0 mm SCL Design
Right Eye

Contamac Definitive
Custom S/H Material

- Latheable
  (made-to-order)
- Daily wear
- Dk = 60
- Water Content: 74%
- Non-surface treated

8 hr. Corneal Swelling with
0.20 Thick HEME vs SiHy

Case Report  CW  Age: 12
History of congenital high hyperopia and astig.
OU with stobmismus and amblyopia OD.

Two year history of soft contact lenses with
blurred and inconsistent vision

Cycloplegic Refraction
RE:  +8.00 -2.50 x 002   20/40
LE:  +7.75 -2.75 x 176   20/20

Two episodes of sterile peripheral corneal ulcers
(one in each eye) while wearing his traditional
59% water HEMA custom toric soft lenses.

Right Eye
39.87 @ 006 / 43.50 @ 096

Left Eye
40.25 @ 174 / 43.50 @ 084

Corneal Astigmatism
Right Eye 3.62 D.
Left Eye 3.37 D.

Custom Toric Design

DK of 60
WC of 74%
If the Sagittal Depth and HVID are NORMAL

Cooper Vision
Biofinity and Biofinity XR
Molded Si-Hy, Dk 128,
Monthly Replacement

Base Curve: 8.6
Powers: -0.50 to -20.00 D.
+0.50 to +15.00 D.
Cylinder: -0.75 to -5.75 D.
Diameter: 14.0 mm

Patient CG
Right Eye 12.89 mm
Left Eye 12.83 mm

CG HVID 12.5 AV Oasis Right Eye
Dispensing Visit

CG HVID 12.5 AV Oasis Right Eye
One Week Follow-Up Visit

CG HVID 12.5 AV Oasis Left Eye
Dispensing Visit

CG HVID 12.5 AV Oasis Left Eye
One Week Follow-Up Visit

42.00 @ 096 / 42.37 @ 006
42.12 @ 078 / 42.37 @ 168
CG Custom SCL Design
Right and Left Eye

CG Custom 15.5 SCL Right Eye
One Week Follow-Up Visit

CG Custom 15.5 SCL Left Eye
One Week Follow-Up Visit

Microphthalmos Right Eye
GP Lens 10.3 mm HVID

Patient Name
Material: 54%

Right eye
H-MID 10.3
Flat K 54.5
Steep K 55.6
Vertex distance 12.0

Arc Length 12.162629

Rx OD Sph Cyl Axis
19 25

ORDER THIS LENS - OD
BC: 6.4
Diameter: 12.5
R ix 25.00 0.0 x00
The Optics of Multifocal SCL’s

The Delivery of Multifocal Optics in Children and Adults

Physical Model Eye

Methods and Materials

- The instrument was configured to an axial refractive error of -2.00 D, and the following multifocal CL’s (-2.00 D distance +2.50 D add) were evaluated.
  - Acuvue
  - AirOptix
  - Proclear (D)
  - Proclear (N)
  - Focus Progressives
  - Purevision
  - Control….Focus Dailies Single Vision -2.00 D.

- Three pupil diameters 3.0, 4.0 and 5.0 mm
### Distance Chart at 3 Meters / 20 Feet

#### 4.0 mm Pupil Distance

<table>
<thead>
<tr>
<th>Lens Type</th>
<th>Focus Progress</th>
<th>Proclear Near</th>
<th>Proclear Distant</th>
<th>Acuvue Multifocal</th>
<th>Focus SV</th>
</tr>
</thead>
<tbody>
<tr>
<td>PureVision Multifocal</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>AirOptix Multifocal</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Focus Multifocal</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Proclear Multifocal</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
</tbody>
</table>

### Near Chart at 40 cm

<table>
<thead>
<tr>
<th>Lens Type</th>
<th>Distance Optic</th>
<th>Line of Sight</th>
</tr>
</thead>
<tbody>
<tr>
<td>PureVision Multifocal</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>AirOptix Multifocal</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Focus Multifocal</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Proclear Multifocal</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

### Decentered Optics

<table>
<thead>
<tr>
<th>Eye</th>
<th>Eye Clarity</th>
<th>Eye Fluctuation</th>
<th>Eye Ghosting</th>
<th>Visual Acuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>8/10</td>
<td>8/10</td>
<td>8/10</td>
<td>20/20</td>
</tr>
<tr>
<td>L</td>
<td>8/10</td>
<td>8/10</td>
<td>8/10</td>
<td>20/20</td>
</tr>
</tbody>
</table>

Robert B. Mandel
The Optics of Myopia Control

What we know in 2017

The Gun

The Bullet

The Target ???

Orthokeratology

Multifocal SCL

Concentration
of Add Power

Physical area of the retina involved in the peripheral defocus “process”

Center Distance Multifocal Soft Lens Designs

Full Minus Correction At Distance

+3.00 D Add at Near

Decentered Optics

Horizontally.... Decenter Optics ?? Nasal Vertically.... Decenter Optics ?? Superior

The Optics of Myopia Control

What we know in 2017

The Gun

The Bullet

The Target ???
SCL’s for the Irregular Cornea

Sagittal Depth and SCL Fitting

SCL Sagittal Height...BC Radius

<table>
<thead>
<tr>
<th>Base</th>
<th>Lens</th>
<th>Lens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curves</td>
<td>Dia</td>
<td>Sag</td>
</tr>
<tr>
<td>8.90</td>
<td>14.5</td>
<td>3,652 um</td>
</tr>
<tr>
<td>8.60</td>
<td>14.5</td>
<td>3,882 um</td>
</tr>
<tr>
<td>8.30</td>
<td>14.5</td>
<td>4,158 um</td>
</tr>
<tr>
<td>8.00</td>
<td>14.5</td>
<td>4,501 um</td>
</tr>
</tbody>
</table>

8.00 to 8.30 = 343 um
8.30 to 8.60 = 276 um
8.60 to 8.90 = 230 um

SMALL 11.3 or Smaller

MEDIUM 11.4 to 12.2

LARGE 12.3 or Larger
### SCL Sagittal Height...Diameter

<table>
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<tbody>
<tr>
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<td>Dia</td>
<td>Sag</td>
</tr>
<tr>
<td>8.60</td>
<td>13.5</td>
<td>3,191 um</td>
</tr>
<tr>
<td>8.60</td>
<td>14.0</td>
<td>3,518 um</td>
</tr>
<tr>
<td>8.60</td>
<td>14.5</td>
<td>3,882 um</td>
</tr>
<tr>
<td>8.60</td>
<td>15.0</td>
<td>4,290 um</td>
</tr>
</tbody>
</table>

- 14.5 to 15.0 = 408 um
- 14.0 to 14.5 = 364 um
- 13.5 to 14.0 = 327 um

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### Achieving Comfort With Contact Lenses 2016

**In the US**

- **37.6 million CL Wearers**
- 3.2 million Begin (New Fits)
- 2.8 million Depart (DC CL's)