

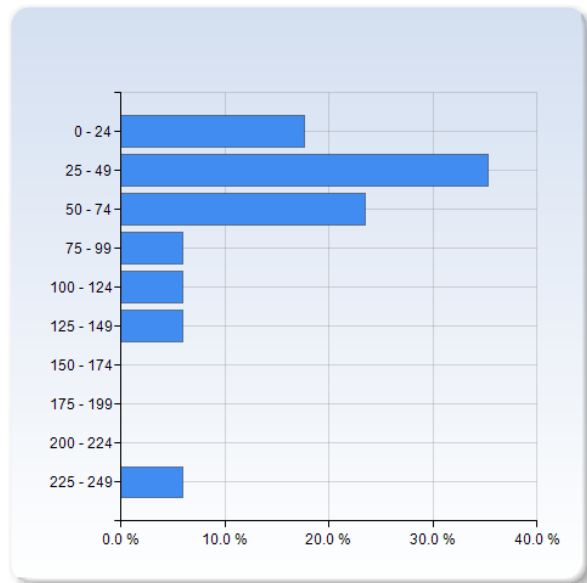
## CXL in Scandinavia NV

Respondents: 20  
 Answer Count: 19  
 Answer Frequency: 95.00%

**How many CXL treatments for progressive keratoconus did your clinic perform for each year?**

**2015**

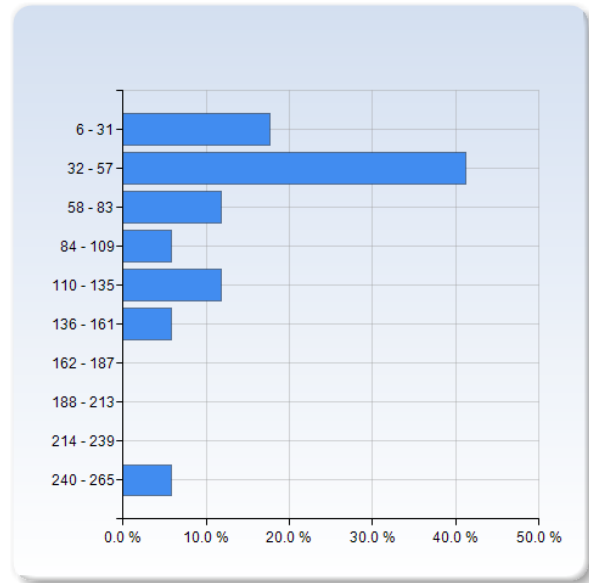
| 2015         | Number of Responses |
|--------------|---------------------|
| 0 - 24       | 3 (17.6%)           |
| 25 - 49      | 6 (35.3%)           |
| 50 - 74      | 4 (23.5%)           |
| 75 - 99      | 1 (5.9%)            |
| 100 - 124    | 1 (5.9%)            |
| 125 - 149    | 1 (5.9%)            |
| 150 - 174    | 0 (0.0%)            |
| 175 - 199    | 0 (0.0%)            |
| 200 - 224    | 0 (0.0%)            |
| 225 - 249    | 1 (5.9%)            |
| <b>Total</b> | <b>17 (100.0%)</b>  |



|      | Mean | Standard Deviation |
|------|------|--------------------|
| 2015 | 62.6 | 58.1               |

## 2016

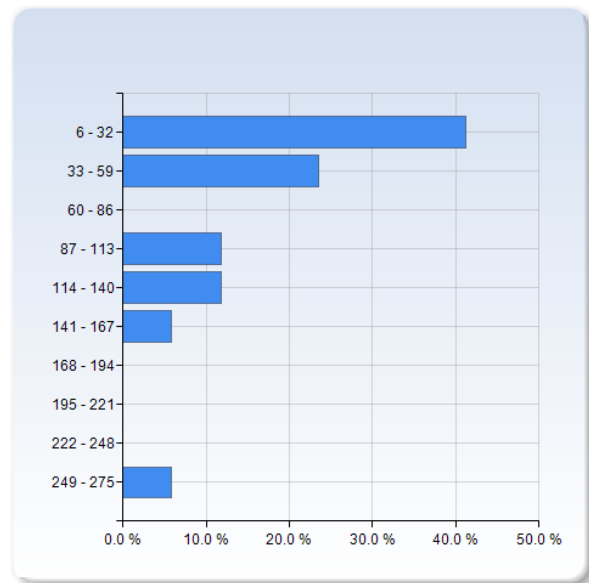
| 2016      | Number of Responses |
|-----------|---------------------|
| 6 - 31    | 3 (17.6%)           |
| 32 - 57   | 7 (41.2%)           |
| 58 - 83   | 2 (11.8%)           |
| 84 - 109  | 1 (5.9%)            |
| 110 - 135 | 2 (11.8%)           |
| 136 - 161 | 1 (5.9%)            |
| 162 - 187 | 0 (0.0%)            |
| 188 - 213 | 0 (0.0%)            |
| 214 - 239 | 0 (0.0%)            |
| 240 - 265 | 1 (5.9%)            |
| Total     | 17 (100.0%)         |



| 2016 | Mean | Standard Deviation |
|------|------|--------------------|
|      | 70.2 | 62.3               |

## 2017

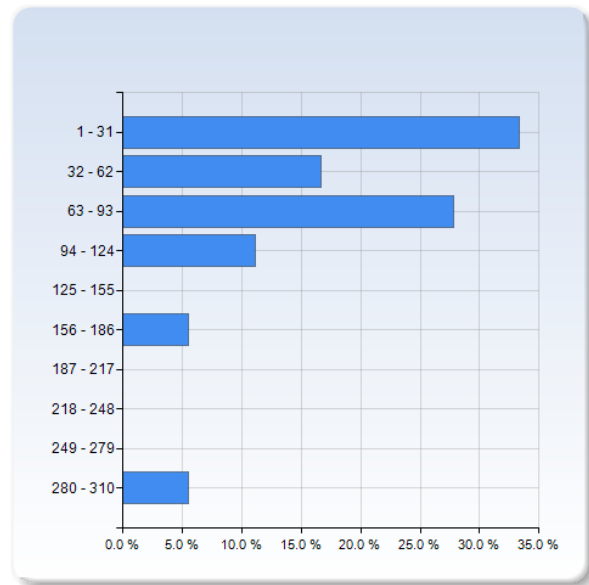
| 2017      | Number of Responses |
|-----------|---------------------|
| 6 - 32    | 7 (41.2%)           |
| 33 - 59   | 4 (23.5%)           |
| 60 - 86   | 0 (0.0%)            |
| 87 - 113  | 2 (11.8%)           |
| 114 - 140 | 2 (11.8%)           |
| 141 - 167 | 1 (5.9%)            |
| 168 - 194 | 0 (0.0%)            |
| 195 - 221 | 0 (0.0%)            |
| 222 - 248 | 0 (0.0%)            |
| 249 - 275 | 1 (5.9%)            |
| Total     | 17 (100.0%)         |



| 2017 | Mean | Standard Deviation |
|------|------|--------------------|
|      | 70.1 | 68.5               |

## 2018

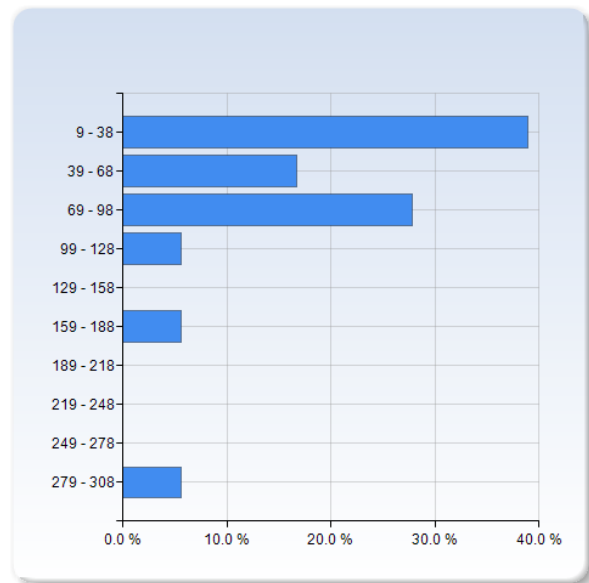
| 2018      | Number of Responses |
|-----------|---------------------|
| 1 - 31    | 6 (33.3%)           |
| 32 - 62   | 3 (16.7%)           |
| 63 - 93   | 5 (27.8%)           |
| 94 - 124  | 2 (11.1%)           |
| 125 - 155 | 0 (0.0%)            |
| 156 - 186 | 1 (5.6%)            |
| 187 - 217 | 0 (0.0%)            |
| 218 - 248 | 0 (0.0%)            |
| 249 - 279 | 0 (0.0%)            |
| 280 - 310 | 1 (5.6%)            |
| Total     | 18 (100.0%)         |



|      | Mean | Standard Deviation |
|------|------|--------------------|
| 2018 | 69.9 | 72.7               |

## 2019

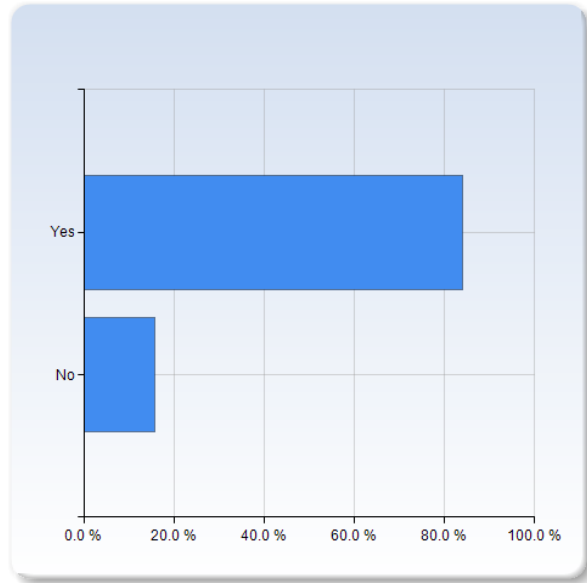
| 2019      | Number of Responses |
|-----------|---------------------|
| 9 - 38    | 7 (38.9%)           |
| 39 - 68   | 3 (16.7%)           |
| 69 - 98   | 5 (27.8%)           |
| 99 - 128  | 1 (5.6%)            |
| 129 - 158 | 0 (0.0%)            |
| 159 - 188 | 1 (5.6%)            |
| 189 - 218 | 0 (0.0%)            |
| 219 - 248 | 0 (0.0%)            |
| 249 - 278 | 0 (0.0%)            |
| 279 - 308 | 1 (5.6%)            |
| Total     | 18 (100.0%)         |



|      | Mean | Standard Deviation |
|------|------|--------------------|
| 2019 | 73.7 | 69.3               |

**The indication for CXL is usually *progressive* keratoconus. Do you assess progression prior to CXL in adults (>18 yrs)? If not, please specify why.**

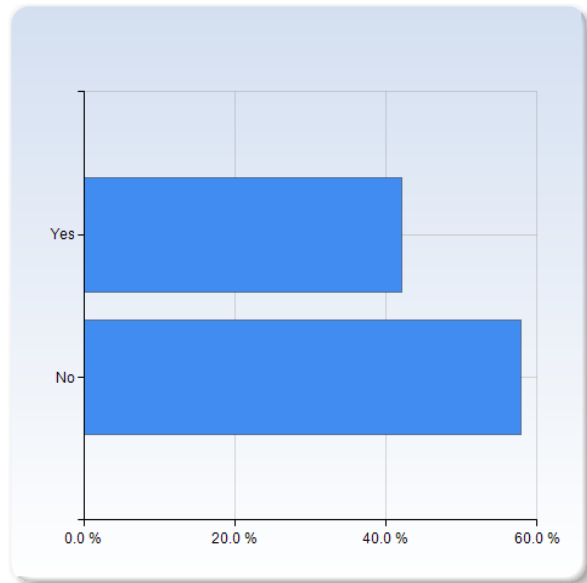
| The indication for CXL is usually <i>progressive</i> keratoconus. Do you assess progression prior to CXL in <b>adults</b> (>18 yrs)? If not, please specify why. | Number of Responses |
|--|---------------------|
| Yes  | 16 (84.2%)          |
| No   | 3 (15.8%)           |
| Total  | 19 (100.0%)         |



| The indication for CXL is usually <i>progressive</i> keratoconus. Do you assess progression prior to CXL in <b>adults</b> (>18 yrs)? If not, please specify why. | Mean | Standard Deviation |
|--|------|--------------------|
|  | 1.2  | 0.4                |

**In general, the indication for CXL is progressive keratoconus. Do you assess progression prior to CXL in children and adolescents (<18 yrs)? If not, please specify.**

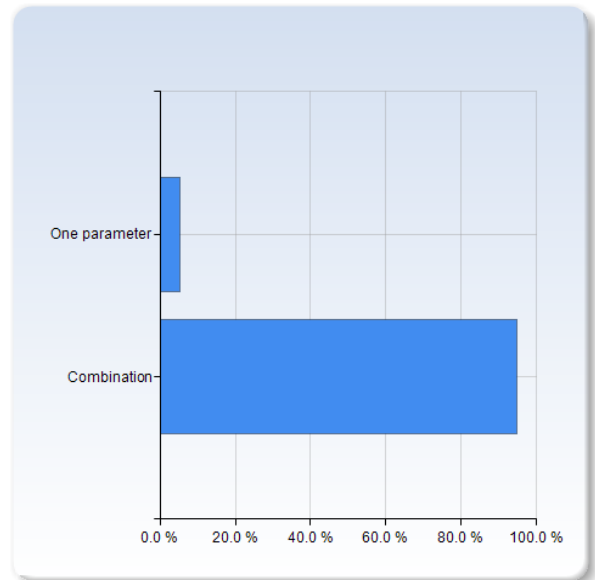
| In general, the indication for CXL is progressive keratoconus. Do you assess progression prior to CXL in <b>children and adolescents</b> (<18 yrs)? If not, please specify. | Number of Responses |
|---|---------------------|
| Yes   | 8 (42.1%)           |
| No  | 11 (57.9%)          |
| Total   | 19 (100.0%)         |



|   | Mean | Standard Deviation |
|---|------|--------------------|
| In general, the indication for CXL is progressive keratoconus. Do you assess progression prior to CXL in <b>children and adolescents</b> (<18 yrs)? If not, please specify. | 1.6  | 0.5                |

### Is one parameter enough to detect progression or must it be a combination of two or more parameters?

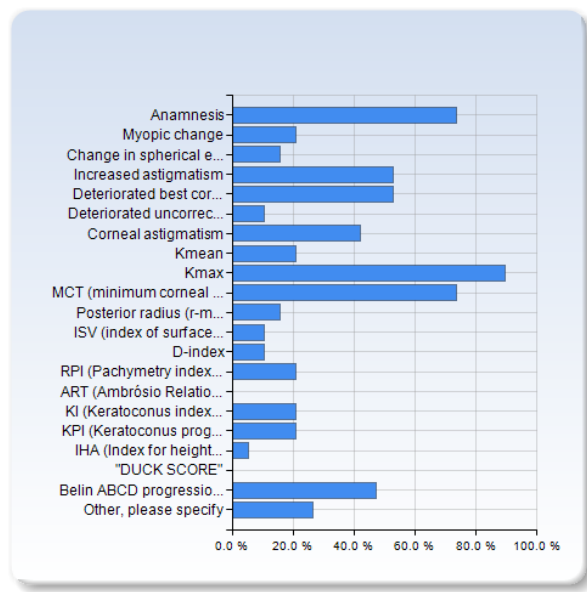
| Is one parameter enough to detect progression or must it be a combination of two or more parameters? | Number of Responses |
|--|---------------------|
| One parameter  | 1 (5.3%)            |
| Combination  | 18 (94.7%)          |
| Total  | 19 (100.0%)         |



|  | Mean | Standard Deviation |
|--|------|--------------------|
| Is one parameter enough to detect progression or must it be a combination of two or more parameters? | 1.9  | 0.2                |

**Mark the parameters that you use to detect progression. Please specify what change in magnitude in the comments.**

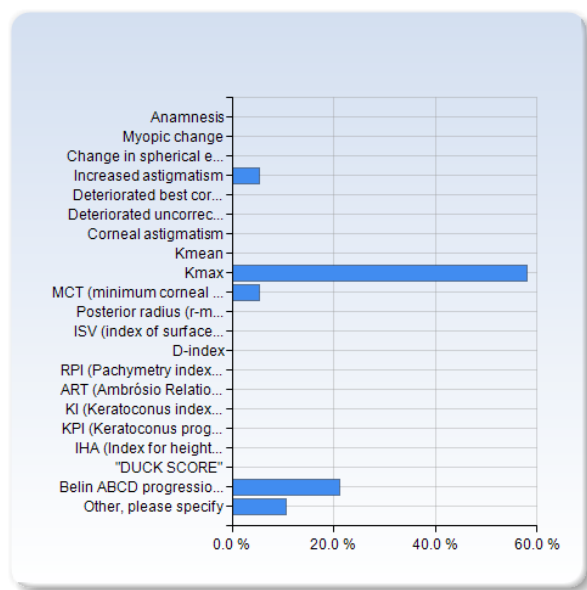
| Mark the parameters that you use to detect progression. Please specify what change in magnitude in the comments. | Number of Responses |
|--|---------------------|
| Anamnesis  | 14 (73.7%)          |
| Myopic change  | 4 (21.1%)           |
| Change in spherical equivalence  | 3 (15.8%)           |
| Increased astigmatism  | 10 (52.6%)          |
| Deteriorated best corrected visual acuity  | 10 (52.6%)          |
| Deteriorated uncorrected visual acuity   | 2 (10.5%)           |
| Corneal astigmatism  | 8 (42.1%)           |
| Kmean  | 4 (21.1%)           |
| Kmax   | 17 (89.5%)          |
| MCT (minimum corneal thickness)  | 14 (73.7%)          |
| Posterior radius (r-min)   | 3 (15.8%)           |
| ISV (index of surface variance)  | 2 (10.5%)           |
| D-index  | 2 (10.5%)           |
| RPI (Pachymetry index)   | 4 (21.1%)           |
| ART (Ambrósio Relation Thickness)  | 0 (0.0%)            |
| KI (Keratoconus index)   | 4 (21.1%)           |
| KPI (Keratoconus progression index)  | 4 (21.1%)           |
| IHA (Index for height asymmetry)   | 1 (5.3%)            |
| "DUCK SCORE"   | 0 (0.0%)            |
| Belin ABCD progression display   | 9 (47.4%)           |
| Other, please specify  | 5 (26.3%)           |
| Total  | 120 (631.6%)        |



| Mark the parameters that you use to detect progression. Please specify what change in magnitude in the comments. | Mean | Standard Deviation |
|--|------|--------------------|
|  | 9.1  | 5.9                |

**Indicate which parameter you believe to be the most important in detecting progression.**

| Indicate which parameter you believe to be the most important in detecting progression. | Number of Responses |
|---|---------------------|
| Anamnesis   | 0 (0.0%)            |
| Myopic change   | 0 (0.0%)            |
| Change in spherical equivalence   | 0 (0.0%)            |
| Increased astigmatism   | 1 (5.3%)            |
| Deteriorated best corrected visual acuity   | 0 (0.0%)            |
| Deteriorated uncorrected visual acuity  | 0 (0.0%)            |
| Corneal astigmatism   | 0 (0.0%)            |
| Kmean   | 0 (0.0%)            |
| Kmax  | 11 (57.9%)          |
| MCT (minimum corneal thickness)   | 1 (5.3%)            |
| Posterior radius (r-min)  | 0 (0.0%)            |
| ISV (index of surface variance)   | 0 (0.0%)            |
| D-index   | 0 (0.0%)            |
| RPI (Pachymetry index)  | 0 (0.0%)            |
| ART (Ambrósio Relation Thickness)   | 0 (0.0%)            |
| KI (Keratoconus index)  | 0 (0.0%)            |
| KPI (Keratoconus progression index)   | 0 (0.0%)            |
| IHA (Index for height asymmetry)  | 0 (0.0%)            |
| "DUCK SCORE"  | 0 (0.0%)            |
| Belin ABCD progression display  | 4 (21.1%)           |
| Other, please specify   | 2 (10.5%)           |
| Total   | 19 (100.0%)         |

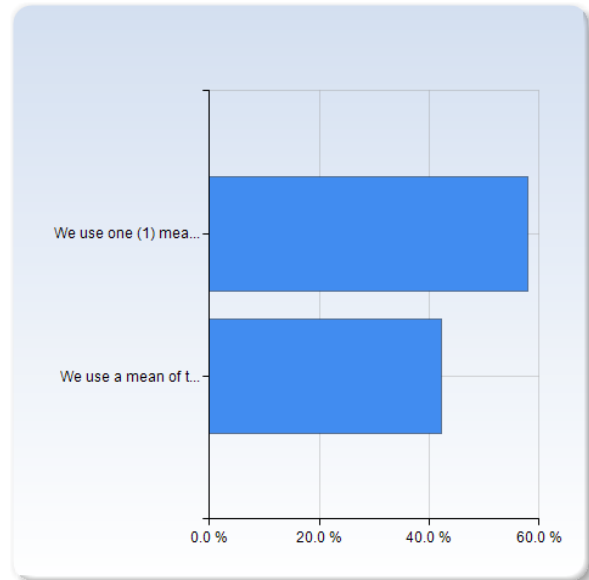


| Indicate which parameter you believe to be the most important in detecting progression. | Mean | Standard Deviation |
|---|------|--------------------|
|   | 12.4 | 5.7                |

**Measurements by topography/tomography are usually compared between clinical visits to assess progression. Do you compare 1 measurement on one occasion against 1 measurement on another occasion, or do you calculate a mean of two or more measurements on one occasion and compare this mean against a mean of two or more measurements on another occasion?**

Measurements by topography/tomography are usually compared between clinical visits to assess progression. Do you compare 1 measurement on one occasion against 1 measurement on another occasion, or do you calculate a mean of two or more measurements on one occasion and compare this mean against a mean of two or more measurements on another occasion?

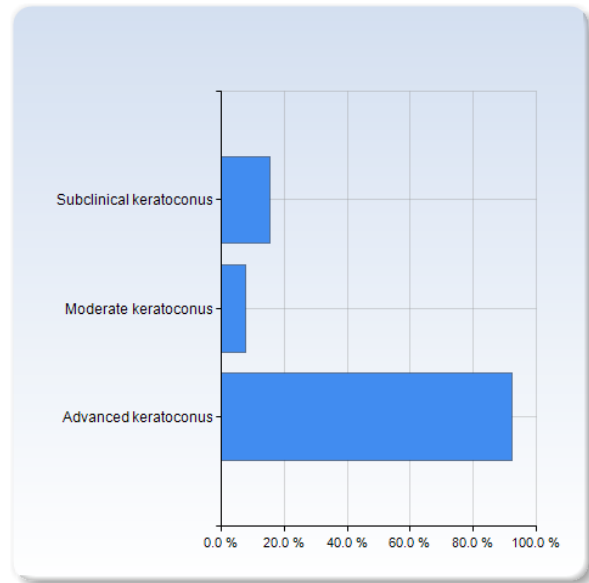
|  | Number of Responses |
|--|---------------------|
| We use one (1) measurement on each occasion                | 11 (57.9%)          |
| We use a mean of two or more measurements on each occasion | 8 (42.1%)           |
| Total  | 19 (100.0%)         |



|  | Mean | Standard Deviation |
|--|------|--------------------|
| Measurements by topography/tomography are usually compared between clinical visits to assess progression. Do you compare 1 measurement on one occasion against 1 measurement on another occasion, or do you calculate a mean of two or more measurements on one occasion and compare this mean against a mean of two or more measurements on another occasion? | 1.4  | 0.5                |

**Is there any subgroup in keratoconus in which it is more difficult to diagnose progression? If yes, please comment.**

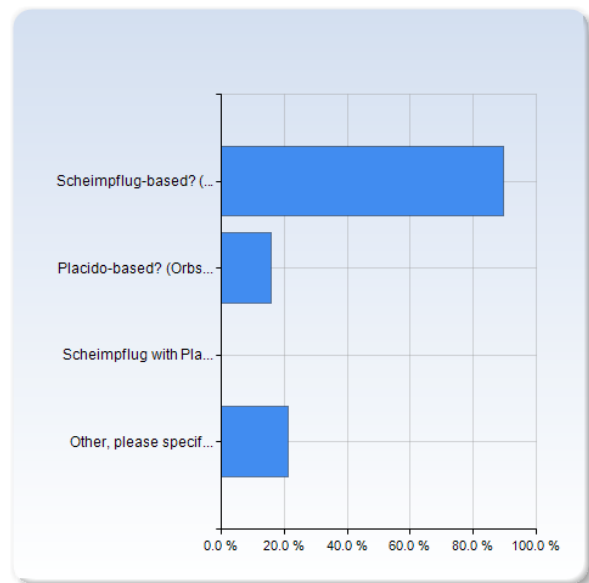
|                         | Number of Responses |
|-------------------------|---------------------|
| Subclinical keratoconus | 2 (15.4%)           |
| Moderate keratoconus    | 1 (7.7%)            |
| Advanced keratoconus    | 12 (92.3%)          |
| Total                   | 15 (115.4%)         |



| Mean | Standard Deviation |
|------|--------------------|
| 2.7  | 0.7                |

**What technical system do you use to define progression? If you use more than one system, please specify when you use which system.**

|                                     | Number of Responses |
|-------------------------------------|---------------------|
| Scheimpflug-based? (Pentacam HR)    | 17 (89.5%)          |
| Placido-based? (Orbscan)            | 3 (15.8%)           |
| Scheimpflug with Placido? (Galilei) | 0 (0.0%)            |
| Other, please specify               | 4 (21.1%)           |
| Total                               | 24 (126.3%)         |

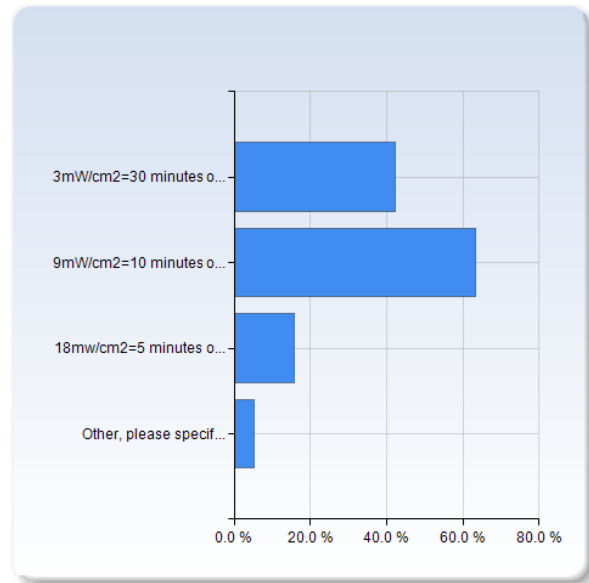


| Mean | Standard Deviation |
|------|--------------------|
| 1.6  | 1.1                |



### What power (W/cm2) do you use? If you use different powers for different patients, please specify why.

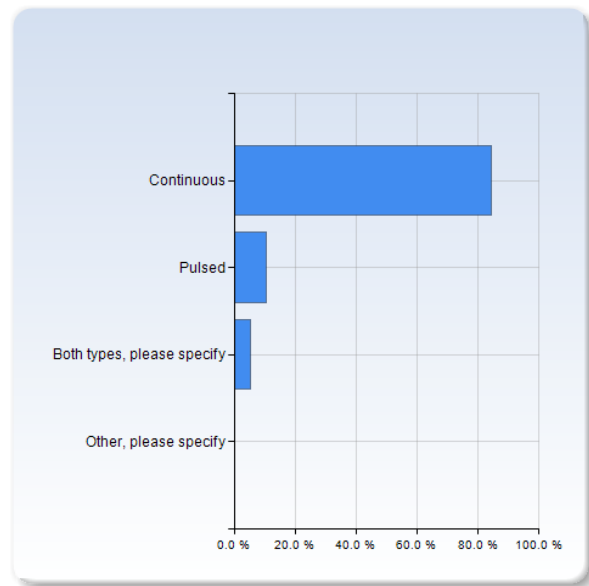
| What power (W/cm2) do you use? If you use different powers for different patients, please specify why. | Number of Responses |
|--|---------------------|
| 3mW/cm2=30 minutes of UVA  | 8 (42.1%)           |
| 9mW/cm2=10 minutes of UVA  | 12 (63.2%)          |
| 18mw/cm2=5 minutes of UVA  | 3 (15.8%)           |
| Other, please specify  | 1 (5.3%)            |
| Total  | 24 (126.3%)         |



| What power (W/cm2) do you use? If you use different powers for different patients, please specify why. | Mean | Standard Deviation |
|--|------|--------------------|
|  | 5.6  | 2.4                |

### Do you use pulsed or continuous UVA irradiation?

| Do you use pulsed or continuous UVA irradiation? | Number of Responses |
|--|---------------------|
| Continuous                                       | 16 (84.2%)          |
| Pulsed   | 2 (10.5%)           |
| Both types, please specify                       | 1 (5.3%)            |
| Other, please specify                            | 0 (0.0%)            |
| Total  | 19 (100.0%)         |

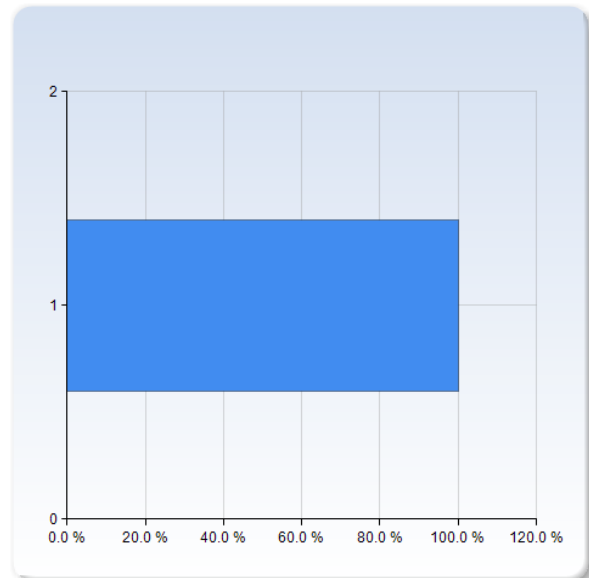


| Do you use pulsed or continuous UVA irradiation? | Mean | Standard Deviation |
|--|------|--------------------|
|  | 1.2  | 0.5                |

**Which CXL protocols do you use clinically? If you use more than one technique, please specify why**

**Epi-on (No epithelial removal)**

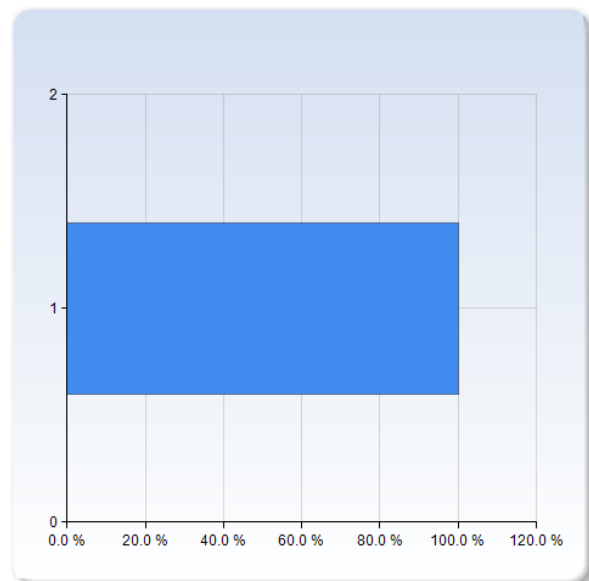
| Epi-on (No epithelial removal) | Number of Responses |
|--------------------------------|---------------------|
|                                | 4 (100.0%)          |
| Total                          | 4 (100.0%)          |



|                                | Mean | Standard Deviation |
|--------------------------------|------|--------------------|
| Epi-on (No epithelial removal) | 1.0  | 0.0                |

**Epi-off (epithelial removal=classical protocol)**

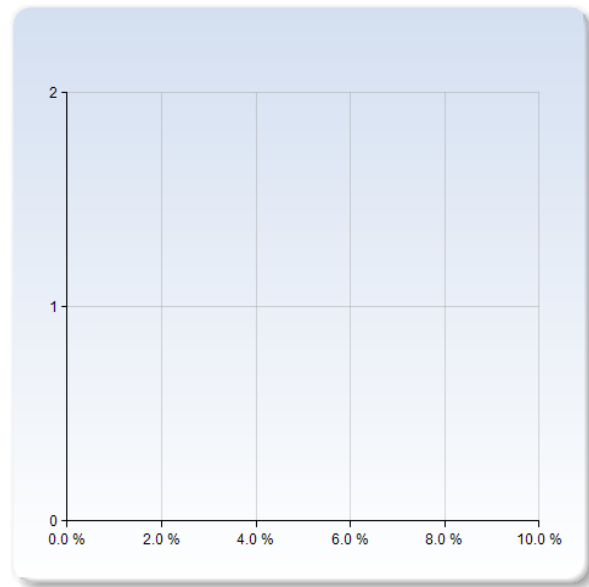
| Epi-off (epithelial removal=classical protocol) | Number of Responses |
|---|---------------------|
|   | 19 (100.0%)         |
| Total   | 19 (100.0%)         |



|   | Mean | Standard Deviation |
|---|------|--------------------|
| Epi-off (epithelial removal=classical protocol) | 1.0  | 0.0                |

## Iontophoresis

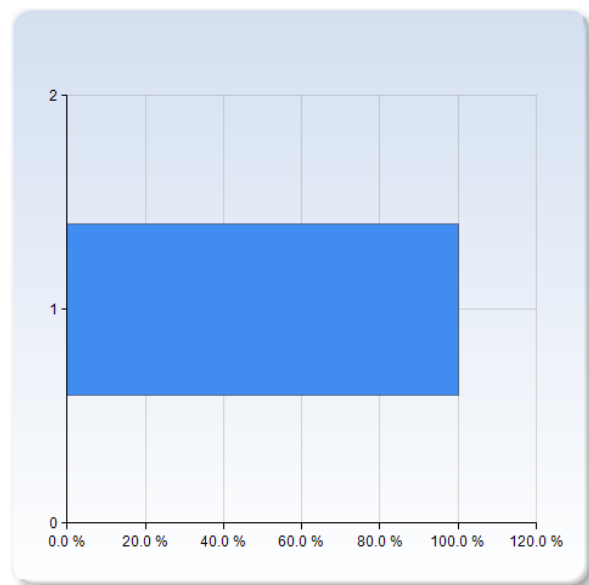
| Iontophoresis | Number of Responses |
|---------------|---------------------|
|               | 0 (0.0%)            |
| Total         | 0 (0.0%)            |



|               | Mean | Standard Deviation |
|---------------|------|--------------------|
| Iontophoresis | 0.0  | 0.0                |

## Other, please specify

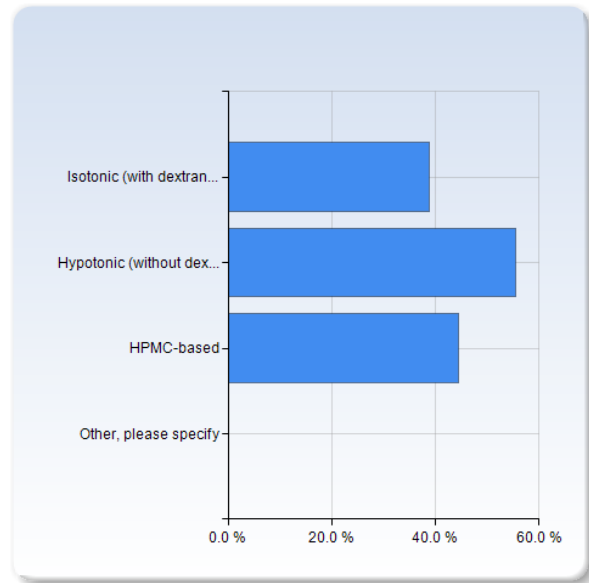
| Other, please specify | Number of Responses |
|-----------------------|---------------------|
|                       | 3 (100.0%)          |
| Total                 | 3 (100.0%)          |



|                       | Mean | Standard Deviation |
|-----------------------|------|--------------------|
| Other, please specify | 1.0  | 0.0                |

**What kind of riboflavin do you use for epi-off techniques? If you use more than one type, please specify the indication for each type.**

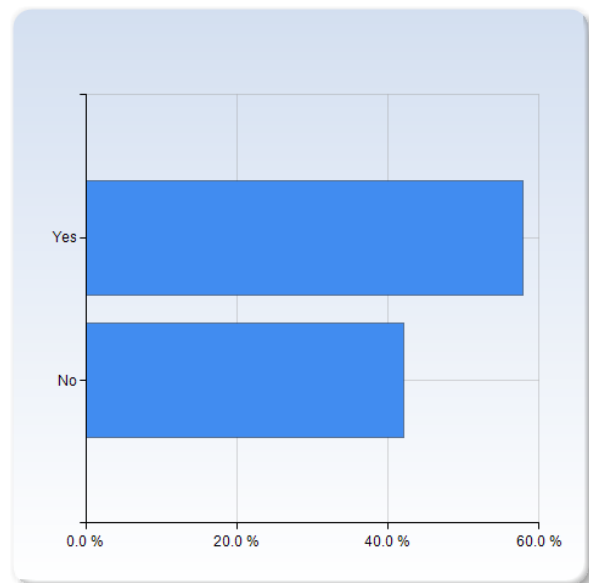
| What kind of riboflavin do you use for epi-off techniques? If you use more than one type, please specify the indication for each type. | Number of Responses |
|--|---------------------|
| Isotonic (with dextran)  | 7 (38.9%)           |
| Hypotonic (without dextran)  | 10 (55.6%)          |
| HPMC-based   | 8 (44.4%)           |
| Other, please specify  | 0 (0.0%)            |
| Total  | 25 (138.9%)         |



| What kind of riboflavin do you use for epi-off techniques? If you use more than one type, please specify the indication for each type. | Mean | Standard Deviation |
|--|------|--------------------|
|  | 2.0  | 0.8                |

**Do you measure corneal thickness after epithelial debridement?**

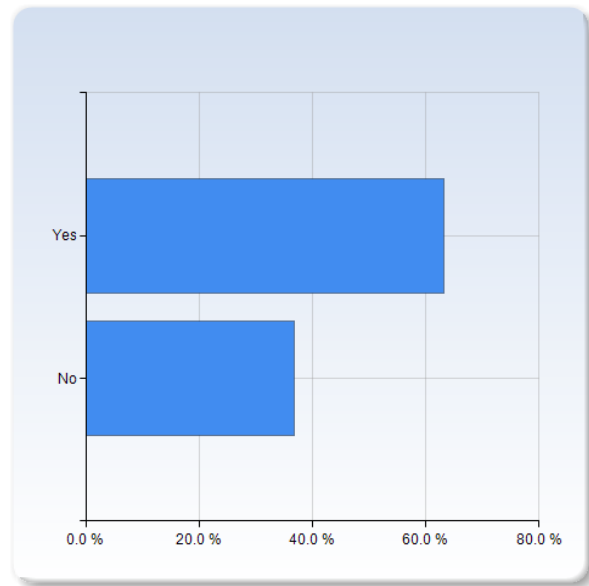
| Do you measure corneal thickness after epithelial debridement? | Number of Responses |
|--|---------------------|
| Yes  | 11 (57.9%)          |
| No   | 8 (42.1%)           |
| Total  | 19 (100.0%)         |



| Do you measure corneal thickness after epithelial debridement? | Mean | Standard Deviation |
|--|------|--------------------|
|  | 1.4  | 0.5                |

## Do you measure corneal thickness immediately prior to UVA illumination?

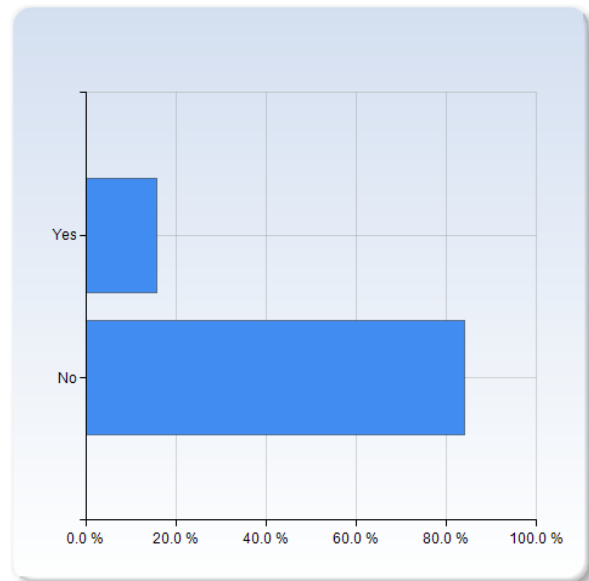
| Do you measure corneal thickness immediately prior to UVA illumination? | Number of Responses |
|---|---------------------|
| Yes   | 12 (63.2%)          |
| No  | 7 (36.8%)           |
| Total   | 19 (100.0%)         |



| Do you measure corneal thickness immediately prior to UVA illumination? | Mean | Standard Deviation |
|---|------|--------------------|
|   | 1.4  | 0.5                |

## Do you check corneal thickness by repeated pachymetry during UVA irradiation?

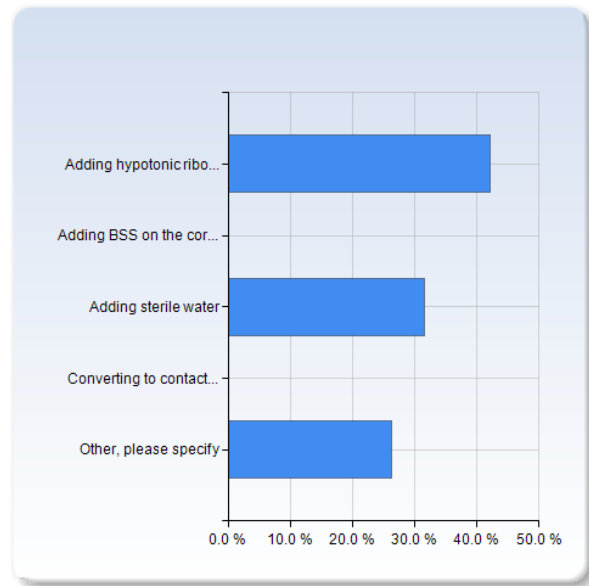
| Do you check corneal thickness by repeated pachymetry during UVA irradiation? | Number of Responses |
|---|---------------------|
| Yes   | 3 (15.8%)           |
| No  | 16 (84.2%)          |
| Total   | 19 (100.0%)         |



| Do you check corneal thickness by repeated pachymetry during UVA irradiation? | Mean | Standard Deviation |
|---|------|--------------------|
|   | 1.8  | 0.4                |

### If the cornea is too thin to be treated safely which is your preferred approach?

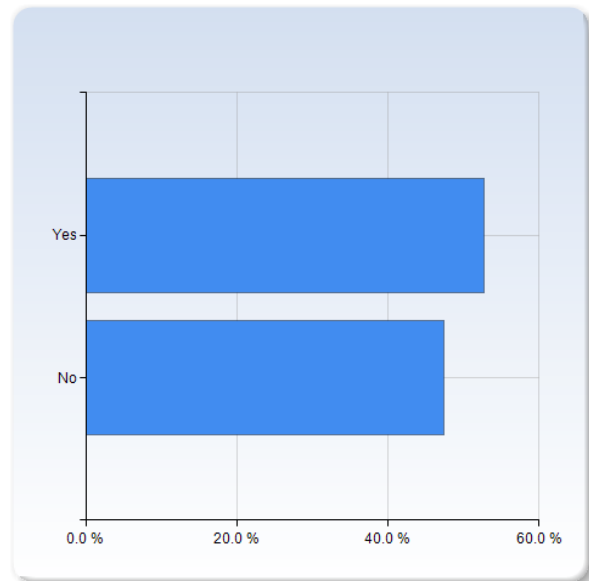
| If the cornea is too thin to be treated safely which is your preferred approach? | Number of Responses |
|--|---------------------|
| Adding hypotonic riboflavin (=without dextran)                                   | 8 (42.1%)           |
| Adding BSS on the cornea   | 0 (0.0%)            |
| Adding sterile water   | 6 (31.6%)           |
| Converting to contact lens-assisted CXL  | 0 (0.0%)            |
| Other, please specify  | 5 (26.3%)           |
| Total  | 19 (100.0%)         |



|  | Mean | Standard Deviation |
|--|------|--------------------|
| If the cornea is too thin to be treated safely which is your preferred approach? | 2.7  | 1.7                |

### Have you had to abandon a CXL procedure due to insufficient corneal thickness?

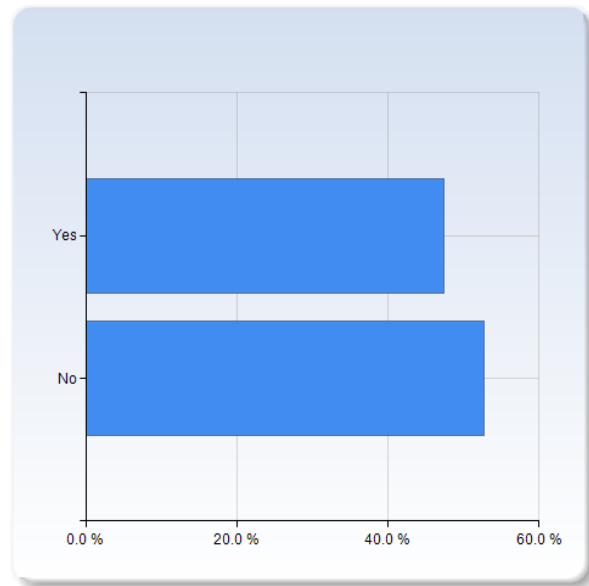
| Have you had to abandon a CXL procedure due to insufficient corneal thickness? | Number of Responses |
|--|---------------------|
| Yes  | 10 (52.6%)          |
| No   | 9 (47.4%)           |
| Total  | 19 (100.0%)         |



|  | Mean | Standard Deviation |
|--|------|--------------------|
| Have you had to abandon a CXL procedure due to insufficient corneal thickness? | 1.5  | 0.5                |

## Do you add a soft contact lens after treatment?

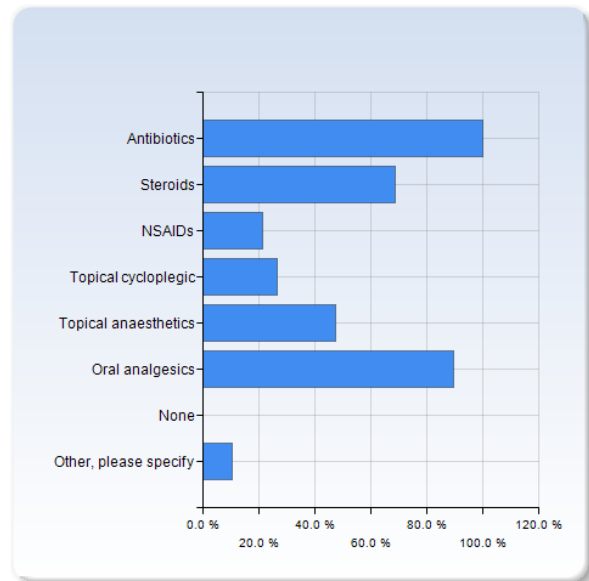
| Do you add a soft contact lens after treatment? | Number of Responses |
|---|---------------------|
| Yes   | 9 (47.4%)           |
| No  | 10 (52.6%)          |
| Total   | 19 (100.0%)         |



| Do you add a soft contact lens after treatment? | Mean | Standard Deviation |
|---|------|--------------------|
|   | 1.5  | 0.5                |

## What is your standard pharmacological treatment after CXL?

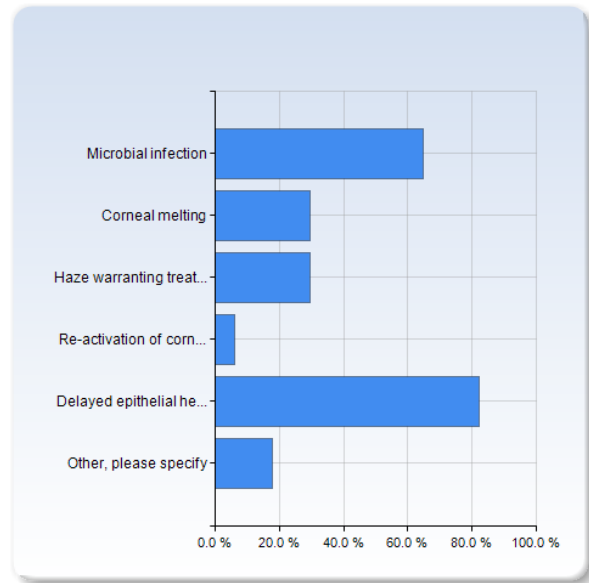
| What is your standard pharmacological treatment after CXL? | Number of Responses |
|--|---------------------|
| Antibiotics  | 19 (100.0%)         |
| Steroids   | 13 (68.4%)          |
| NSAIDs   | 4 (21.1%)           |
| Topical cycloplegic  | 5 (26.3%)           |
| Topical anaesthetics                                       | 9 (47.4%)           |
| Oral analgesics  | 17 (89.5%)          |
| None   | 0 (0.0%)            |
| Other, please specify                                      | 2 (10.5%)           |
| Total  | 69 (363.2%)         |



| What is your standard pharmacological treatment after CXL? | Mean | Standard Deviation |
|--|------|--------------------|
|  | 3.4  | 2.1                |

## In a retrospective review, have you observed complications of CXL treatment for keratoconus?

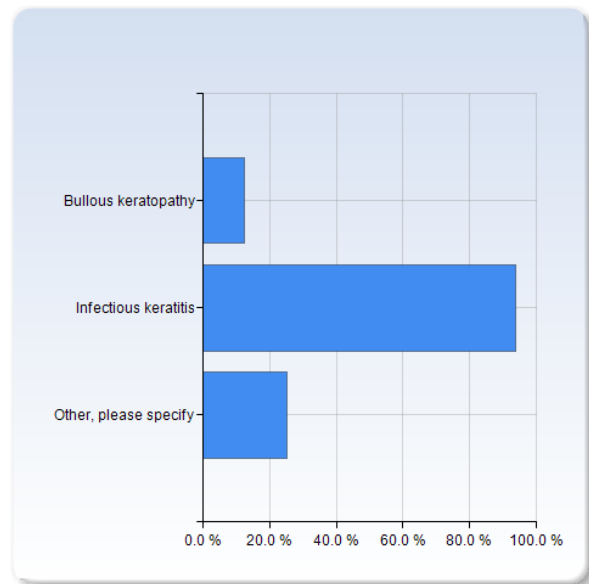
| In a retrospective review, have you observed complications of CXL treatment for keratoconus? | Number of Responses |
|--|---------------------|
| Microbial infection  | 11 (64.7%)          |
| Corneal melting  | 5 (29.4%)           |
| Haze warranting treatment  | 5 (29.4%)           |
| Re-activation of corneal herpes  | 1 (5.9%)            |
| Delayed epithelial healing   | 14 (82.4%)          |
| Other, please specify  | 3 (17.6%)           |
| Total  | 39 (229.4%)         |



| In a retrospective review, have you observed complications of CXL treatment for keratoconus? | Mean | Standard Deviation |
|--|------|--------------------|
|  | 3.3  | 1.8                |

## Do you use CXL for treatment of diseases other than keratoconus?

| Do you use CXL for treatment of diseases other than keratoconus? | Number of Responses |
|--|---------------------|
| Bullous keratopathy  | 2 (12.5%)           |
| Infectious keratitis   | 15 (93.8%)          |
| Other, please specify  | 4 (25.0%)           |
| Total  | 21 (131.3%)         |

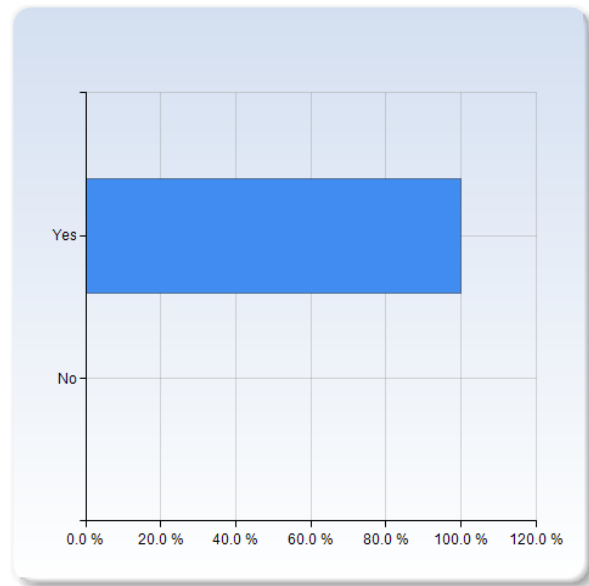


| Do you use CXL for treatment of diseases other than keratoconus? | Mean | Standard Deviation |
|--|------|--------------------|
|  | 2.1  | 0.5                |



### Do you follow up patients after CXL?

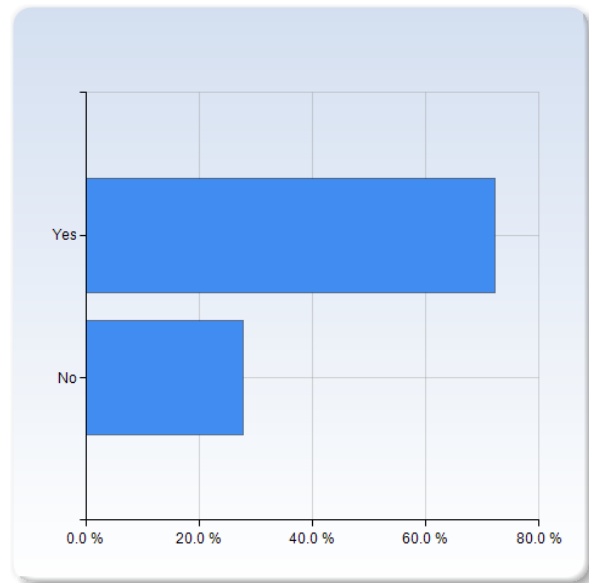
| Do you follow up patients after CXL? | Number of Responses |
|--------------------------------------|---------------------|
| Yes                                  | 19 (100.0%)         |
| No                                   | 0 (0.0%)            |
| Total                                | 19 (100.0%)         |



|                                      | Mean | Standard Deviation |
|--------------------------------------|------|--------------------|
| Do you follow up patients after CXL? | 1.0  | 0.0                |

### Have you experienced a need for re-treatment with CXL?

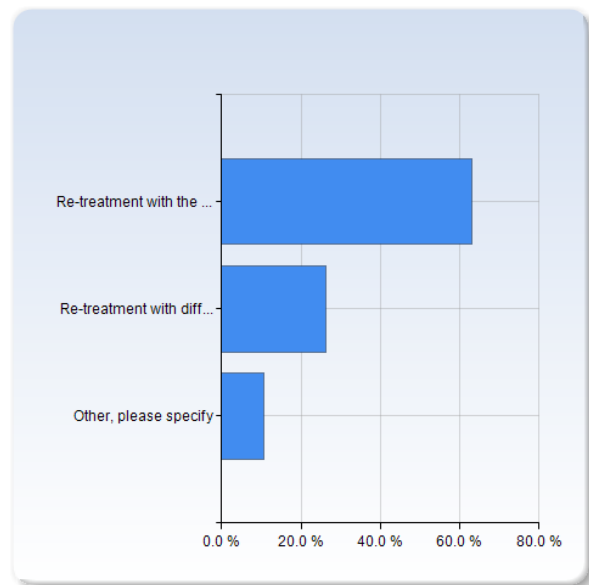
| Have you experienced a need for re-treatment with CXL? | Number of Responses |
|--|---------------------|
| Yes  | 13 (72.2%)          |
| No   | 5 (27.8%)           |
| Total  | 18 (100.0%)         |



|  | Mean | Standard Deviation |
|--|------|--------------------|
| Have you experienced a need for re-treatment with CXL? | 1.3  | 0.5                |

## What is your approach if there is progression after CXL treatment?

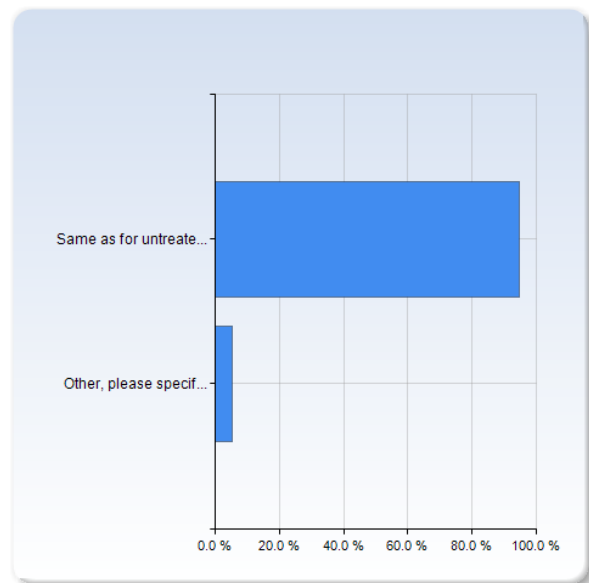
| What is your approach if there is progression after CXL treatment? | Number of Responses |
|--|---------------------|
| Re-treatment with the <b>same</b> CXL protocol                     | 12 (63.2%)          |
| Re-treatment with <b>different</b> CXL protocol (Please specify)   | 5 (26.3%)           |
| Other, please specify  | 2 (10.5%)           |
| Total  | 19 (100.0%)         |



| What is your approach if there is progression after CXL treatment? | Mean | Standard Deviation |
|--|------|--------------------|
|  | 1.5  | 0.7                |

## How do you evaluate the need for re-treatment?

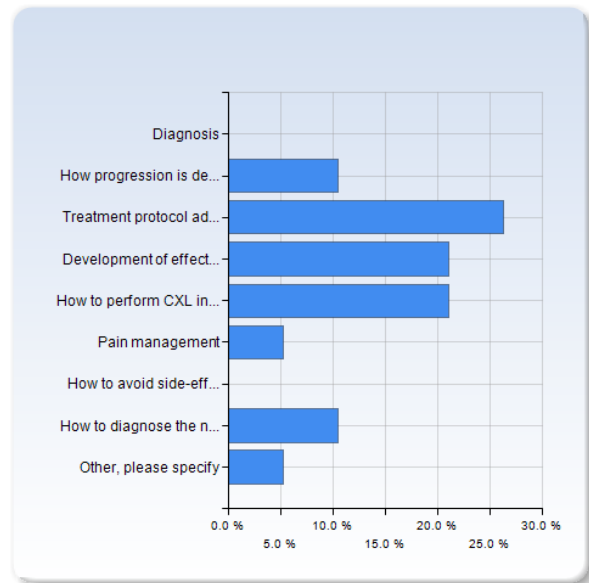
| How do you evaluate the need for re-treatment? | Number of Responses |
|--|---------------------|
| Same as for untreated patients                 | 18 (94.7%)          |
| Other, please specify                          | 1 (5.3%)            |
| Total  | 19 (100.0%)         |



| How do you evaluate the need for re-treatment? | Mean | Standard Deviation |
|--|------|--------------------|
|  | 1.1  | 0.2                |

## Which of the following aspects is in greatest need of improvement in CXL?

| Which of the following aspects is in greatest need of improvement in CXL? | Number of Responses |
|---|---------------------|
| Diagnosis   | 0 (0.0%)            |
| How progression is defined  | 2 (10.5%)           |
| Treatment protocol adaptation to different patients                       | 5 (26.3%)           |
| Development of effective epi-on protocols                                 | 4 (21.1%)           |
| How to perform CXL in thin corneas  | 4 (21.1%)           |
| Pain management   | 1 (5.3%)            |
| How to avoid side-effects   | 0 (0.0%)            |
| How to diagnose the need for re-treatment                                 | 2 (10.5%)           |
| Other, please specify   | 1 (5.3%)            |
| Total   | 19 (100.0%)         |



| Which of the following aspects is in greatest need of improvement in CXL? | Mean | Standard Deviation |
|---|------|--------------------|
| Which of the following aspects is in greatest need of improvement in CXL? | 5.2  | 2.6                |