Toric Intraocular Lenses

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International Vision Correction Research Centre (IVCRC)
Rayner Centerflex 570H

- Refractive Index: 1.46
- A-Constant: 118.0
- Watercontent: 26%
- No Haptic Angulation

- Overall-Diameter: 12.00 mm
- Optical-Diameter: 5.75 mm
- Single-piece, hydrophilic acrylic
- Square edge design
Anti-Vaulting-Haptic Technology (AHV™)

Good centration and rotational stability
Centerflex 571 T

- Single-piece hydrophilic acrylic design
- 26% water content
- 1.46 refractive index
- 5.75 mm optic. overall length 12.0 mm
- Anterior surface spherical
- Posterior toric surface
## Centerflex 571 T: range

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sphere:</strong></td>
<td>+16 D to +26 D (in 0.5 D increments)</td>
<td>+2 D to +32 D (in 0.5 D increments)</td>
</tr>
<tr>
<td><strong>Cylinder:</strong></td>
<td>+2 D to +6 D (in 1.0 D increments)</td>
<td>+1.5 D to +11 D (in 0.5 D increments)</td>
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</tbody>
</table>

Premium: custom manufactured to patient’s prescription
Clinical examination I: Rotation and decentration
Patients & Methods

- 19 eyes Centerflex 571 T (without torus)
- Follow-up: 1 day, 1 week, 1 month
- Measurement of rotation and decentration using Adobe Photoshop
Rotation and Decentration
1 month post-op
Clinical examination II: Functional Results Centerflex 571 T
ORDERFORM TORIC IOL
Keratometry (IOL-Master, Javal)  

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<tbody>
<tr>
<td>K1</td>
<td>7.90</td>
<td>42.72</td>
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<td>K2</td>
<td>7.16</td>
<td>47.14</td>
<td>61</td>
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AXIAL LENGTH

ACD

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</table>
### ORDERFORM TORIC IOL

#### Proposals for standard production toric IOL’s

<table>
<thead>
<tr>
<th>Estimated target refraction</th>
<th>IOL</th>
<th>No.</th>
<th>Price</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>0.00</td>
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<tr>
<td></td>
<td></td>
<td>2</td>
<td>0.00</td>
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<tr>
<td></td>
<td></td>
<td>3</td>
<td>0.00</td>
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#### Proposals for premium production toric IOL’s

<table>
<thead>
<tr>
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<tbody>
<tr>
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<tr>
<td></td>
<td></td>
<td>5</td>
<td></td>
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<td></td>
<td></td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

*The axis marks indicate the IOL’s lowest power meridian.*

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**TARGET REFRACTION**

**TORIC IOL**
### ORDERFORM TORIC IOL

#### Section II: To be completed by Rayner

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<th>IOL</th>
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<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spherical Equivalent</td>
<td>Sphere</td>
<td>Cylinder</td>
<td>Sphere</td>
</tr>
<tr>
<td>0.4</td>
<td>0.4</td>
<td>0.0</td>
<td>10.5</td>
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<tr>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>11.0</td>
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<tr>
<td>-0.3</td>
<td>-0.3</td>
<td>0.0</td>
<td>11.5</td>
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</tbody>
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**Proposals for premium production toric IOL’s**

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</table>

*NO PREMIUM LENS*

**Attention!**

- The axis marks indicate the IOL’s lowest power meridian.

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Toric IOL Fixation
Marking of Axis

Zur Anzeige wird der QuickTime™ Dekompressor „YUV420 codec“ benötigt.
Centerflex - C-Flex

Enhanced 360° sharp optic edge
Patients

- 27 eyes of 18 patients
- Mean age: 59.9 ± 12.2 years (40 to 77 years)
- Mean astigmatism preop: -5.1 +/- 2.9 D

Toric IOLs:

Sphere: 14.4 +/- 5.4 D (Range: 5 – 21.5 D)
Torus: 6.4 +/- 3.3 D (Range: 2 – 11 D)
Reasons for toric IOL implantation

- 74% Astigmatism
- 19% Keratoplasty
- 7% Corneal Scar / Dystrophy
IOL-Torus-Power-Values

Rayner 571T Toric IOL (n=27)
Development of BCDVA
Rayner 571T toric IOL

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Development of spherical equivalent (SE)

- Target SE
- 1 day postop
- 1-3 months postop

[D]
Difference: Pre-op target SE versus post-op SE

82% +/- 1 D
Difference:
Pre-op target SE versus post-op SE

Number of eyes (%)

- +/- 0.5 D: 55.56%
- +/- 1 D: 81.48%
- +/- 1.5 D: 88.89%
- +/- 2 D: 96.3%
- +/- 2.5 D: 100%
Example: Refractive Lens Exchange

57-year old patient, female: left eye

<table>
<thead>
<tr>
<th></th>
<th>Sph.</th>
<th>Cyl.</th>
<th>°</th>
<th>SE</th>
<th>BCDVA</th>
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<tbody>
<tr>
<td>preoperative</td>
<td>0.5</td>
<td>-3.5</td>
<td>180</td>
<td>-1.25</td>
<td>0.9</td>
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<tr>
<td>571 T</td>
<td>18.5</td>
<td>+3</td>
<td></td>
<td>-0.2</td>
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<tr>
<td>postoperative</td>
<td>0.25</td>
<td>-0.5</td>
<td>60</td>
<td>0</td>
<td>0.9</td>
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</tbody>
</table>
**Example: Cataract**

77-year old patient, male: right eye

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<th>°</th>
<th>SE</th>
<th>BCDVA</th>
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<tbody>
<tr>
<td>preoperative</td>
<td>2.75</td>
<td>-8.0</td>
<td>90</td>
<td>-1.25</td>
<td>0.5</td>
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<tr>
<td>571 T</td>
<td>12.5</td>
<td>+8.75</td>
<td></td>
<td>-0.5</td>
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<tr>
<td>postoperative</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0.8</td>
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Example: Keratoplasty

40-year old patient, male: right eye

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<th>Sph.</th>
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<th>°</th>
<th>SE</th>
<th>BCDVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>preoperative</td>
<td>5.0</td>
<td>-9.0</td>
<td>35</td>
<td>0.5</td>
<td>0.4</td>
</tr>
<tr>
<td>571 T</td>
<td>19</td>
<td>+11</td>
<td></td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>postoperative</td>
<td>1.0</td>
<td>-2.0</td>
<td>70</td>
<td>0</td>
<td>0.63</td>
</tr>
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</table>
Transcleral Fixation of a Rayner 571T Toric IOL

Pre-OP: +20/-11/25° =0.3  
Post-OP: +1/-2/15° =0.3  

*IOL: Rayner 571 T: +20 Sphere +11 Torus*
Transscleral fixation of Center/C-/Superflex

Suture fixation

Suture fixation
Introduction of a new IOL type

Combination of 2 optical principles.
Combining Optical Features

First Implantation of a toric, multifocal IOL

Model Rayner 588F C-Flex

Patient T.A., female, 45 years, RLE procedure

Pre-OP data:

BCDVA: OD: +8.0/-2.25/170° = 0.8
OS: +10.25/-3.25/5° = 0.8

IOL: OD: +33.5 / +3 Near Add/ -3.5 Torus
OD: +36.5 / +3 Near Add/ -4.5 Torus
First Implantation of a toric, multifocal IOL

Model Rayner 588F C-Flex: 28.06.2006
First Implantation of a toric, multifocal IOL

Model Rayner 588F C-Flex

Post-OP data:

UCDVA:  OD = 0.9
        OS = 0.6

UCNVA:  OD = 0.5
        OS = 0.5
Defocus Curve
Rayner Toric, multifocal IOL 588F

Defocus (Dpt.)

OD
OS

20/200 = 0.1
20/25 = 0.8
20/40 = 0.5
20/20 = 1.0

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Conclusions: Toric IOLs

- excellent centration and minimal rotation
- difference between target and achieved spherical equivalent -0.16 +/- 0.83 D
- 80% of eyes +/- 1.0 D
- correction of higher astigmatism up to 11 D torus possible
- transscleral fixation possible
Conclusions: Toric IOLs

- The Rayner toric IOL provides excellent results in cataract surgery.
- In refractive surgery.
- After keratoplasty.