Topics to be addressed

1. Decision tree
2. Asphericity of the cornea pre/post
3. Presbyopia module
4. Personalized nomograms
Topics to be addressed

1. Decision tree
2. Asphericity of the cornea pre/post
3. Presbyopia module
4. Personalized nomograms
- refraction
- aberrometry
- topography
- Scheimpflug photography
- biomechanics

**decision tree**

- recommended ablation profile
  - wavefront-guided
  - topography-guided
  - Q factor-guided
Topics to be addressed

1. Decision tree
2. Asphericity of the cornea pre/post
3. Presbyopia module
4. Personalized nomograms
Spherical aberration is still the most challenging postoperative aberration after spherical refractive operations.

Spherical aberration is linearly related with the postoperative Q-factor of the cornea.
Wavefront-Optimized LASIK
Spherical Aberration v. Treatment Amount

-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4

Very Small Scale

• Very little change in spherical aberration regardless of treatment amount
• Different than other laser platforms
• Proves concept of wavefront-optimization!
Spherical aberration is still the most challenging postoperative aberration after spherical refractive operations.

Spherical aberration is linearly related with the postoperative Q-factor of the cornea.

Selecting a postoperative Q-factor is based on preoperative Q-factor, aberrometry, and the desired depth of perception.

Next step: ablation profile based on ray tracing.
Topics to be addressed

1. Decision tree
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The global optimum shape of the cornea is not a multifocal cornea but an aspheric cornea.

It does not produce 2 foci and the brain selects the appropriate image like in bifocal IOLs.

The driving force is the pupil diameter that shifts the focus of the optics.
### PresbyLASIK clinical data

**pilot study, n=15, non-dominant eyes**

Preop sph -0.5 to +1.5D, cyl < 0.75D

<table>
<thead>
<tr>
<th></th>
<th>distant VA (100cd)</th>
<th>near VA (100cd)</th>
<th>low contrast VA (80cd)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mean</strong></td>
<td>0.82</td>
<td>0.65 (J2)</td>
<td>0.58 (pre 0.62)</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>± 0.15</td>
<td>± 0.08</td>
<td>± 0.12 (0.2)</td>
</tr>
<tr>
<td><strong>range</strong></td>
<td>0.5 to 1.0</td>
<td>J1 to J3</td>
<td>0.3 to 0.8</td>
</tr>
</tbody>
</table>
Find criteria to select patients who benefit from this approach

Provide a set of contact lenses to simulate the preoperative outcome

Establish nomograms regarding depth of perception, residual astigmatism, pupil activity, intraocular aberrations, and age of the patient
Topics to be addressed

1. Decision tree
2. Asphericity of the cornea pre/post
3. Presbyopia module
4. Personalized nomograms
Based on the FDA-trials we learned that the refractive outcome varies significantly from site to site.

The following parameters seem to play a role:

- surgical technique
- laser environment
- surgeon skills (pragmatical, experience)
Topics to be addressed

1. Decision tree
2. Asphericity of the cornea pre/post
3. Presbyopia module
4. Personalized nomograms
5. Technical advances ???