Primary goal of refractive surgery

1. To correct for the refractive error
2. Do not change the optical performance of the eye

Why?
Neuronal processing in the visual cortex matches the optical performance of the eye and takes years to change.

Theoretical optics
Can the aberrations of the entire eye be corrected at the cornea only?
No
But all aberrations originating from the cornea can! especially those that we created.
classical profile

44 D
39 D

aberrations = the cornea is oblate

reasons for the induced aberrations
- geometrical reduction of fluence
- reflection of UV
- biomechanical effects
- healing

wavefront-optimized profile

Design of the wavefront-optimized profile

OZ with gradient corresponding wavefront

Manns 2001: \( W = (0.535 + Q) - 0.046/R \)

In addition to the sphero-cylindrical correction, the induced spherical aberration is compensated
Conclusions

1. The wavefront-optimized profile corrects the refractive error only.
2. The wavefront-optimized profile requires minimal neuronal processing post-op.
3. Eyes with a poor optical performance (rmsh>0.3µm) and high VA (>20/16) may benefit from wavefront-guided treatment.
4. This subgroup represents only 5% or less of the population of a refractive surgery practice.