

A large, stylized graphic of a human eye, rendered in shades of blue. The eye is centered on the slide and serves as a background for the text. It features a prominent iris and pupil area, with a network of lines representing the optic nerve and retinal vessels extending from the center.

Cataract in severe hyperopia

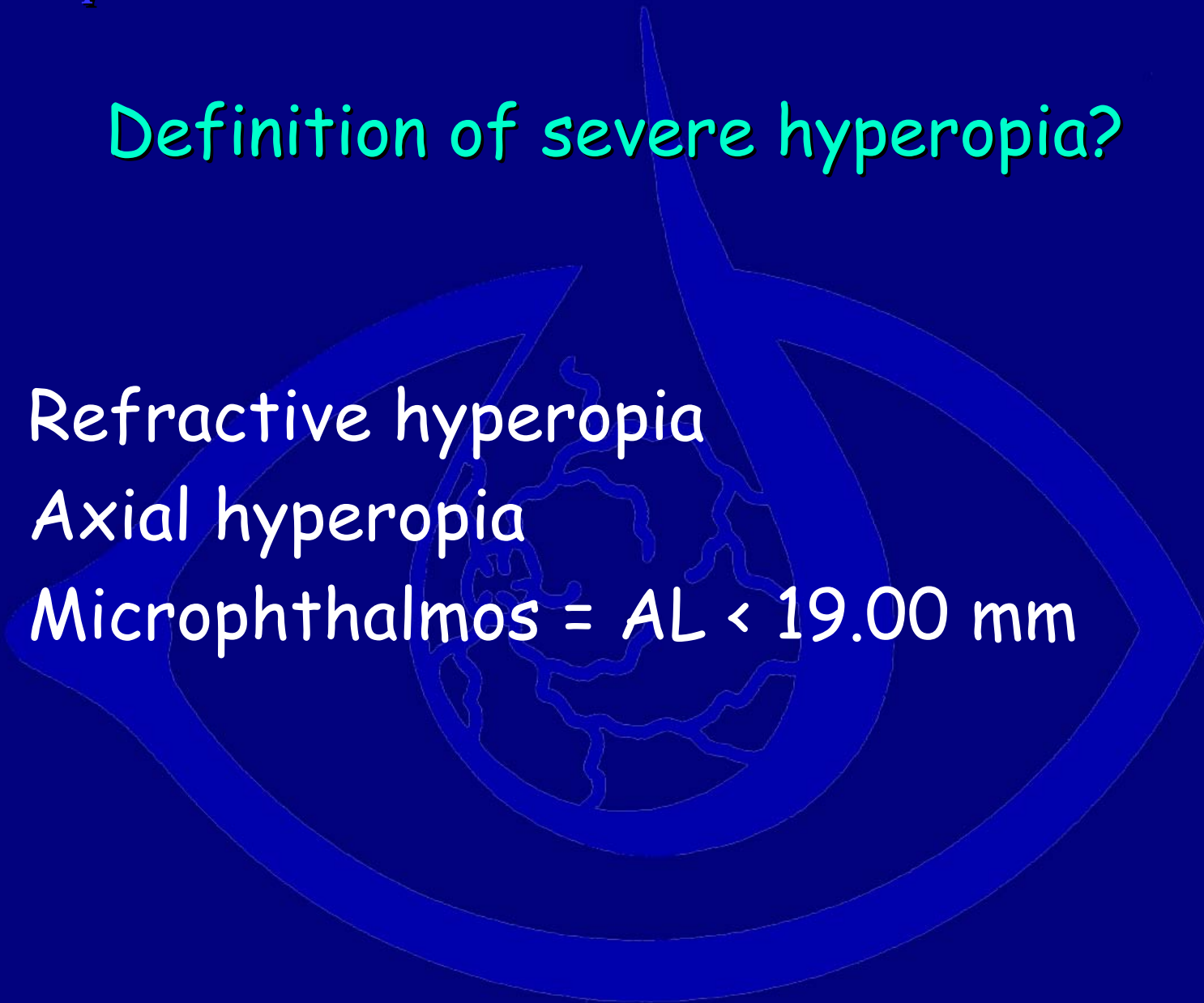
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Definition of severe hyperopia?

- Refractive hyperopia
- Axial hyperopia
- Microphthalmos = $AL < 19.00$ mm

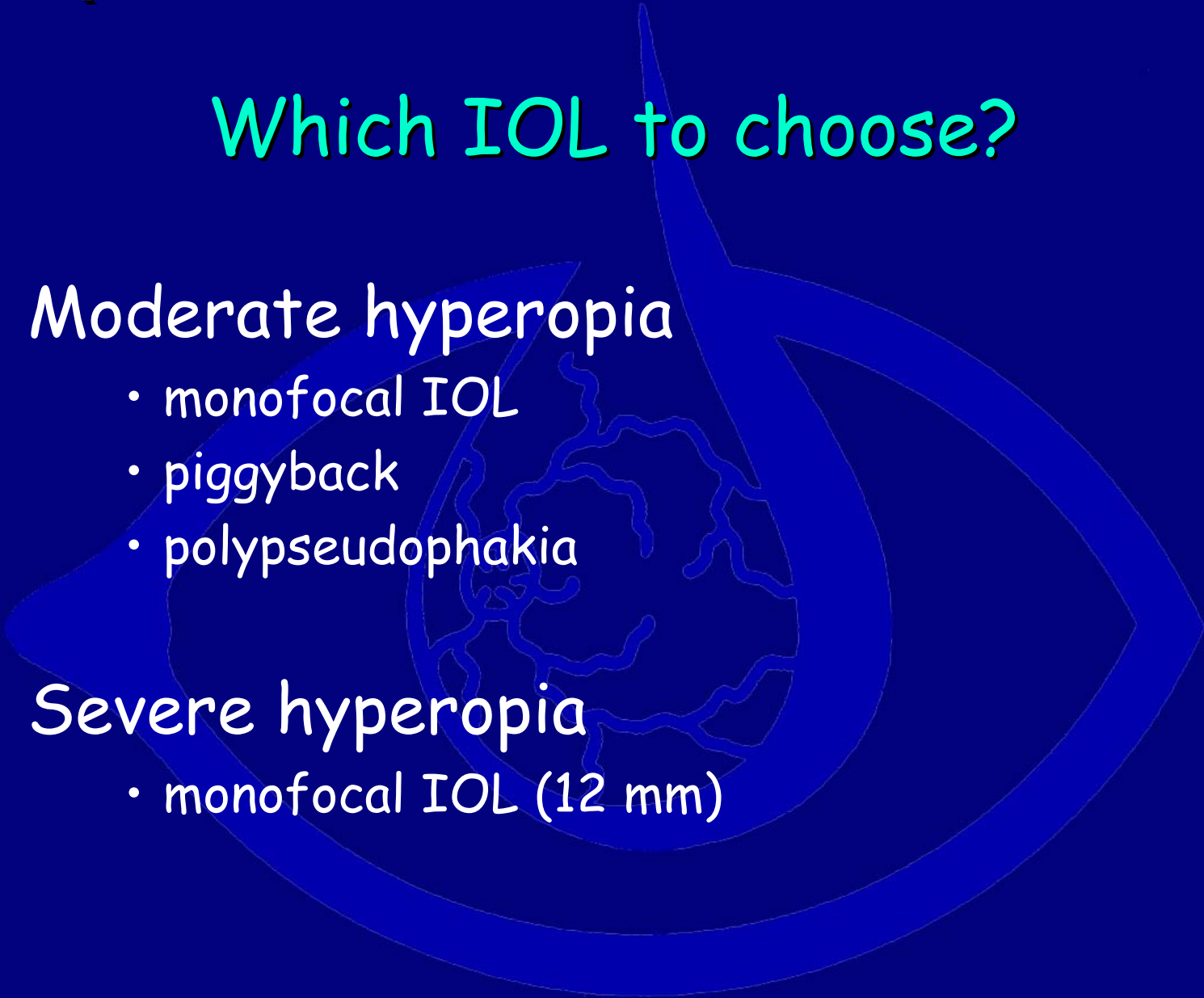


IOL Power calculation

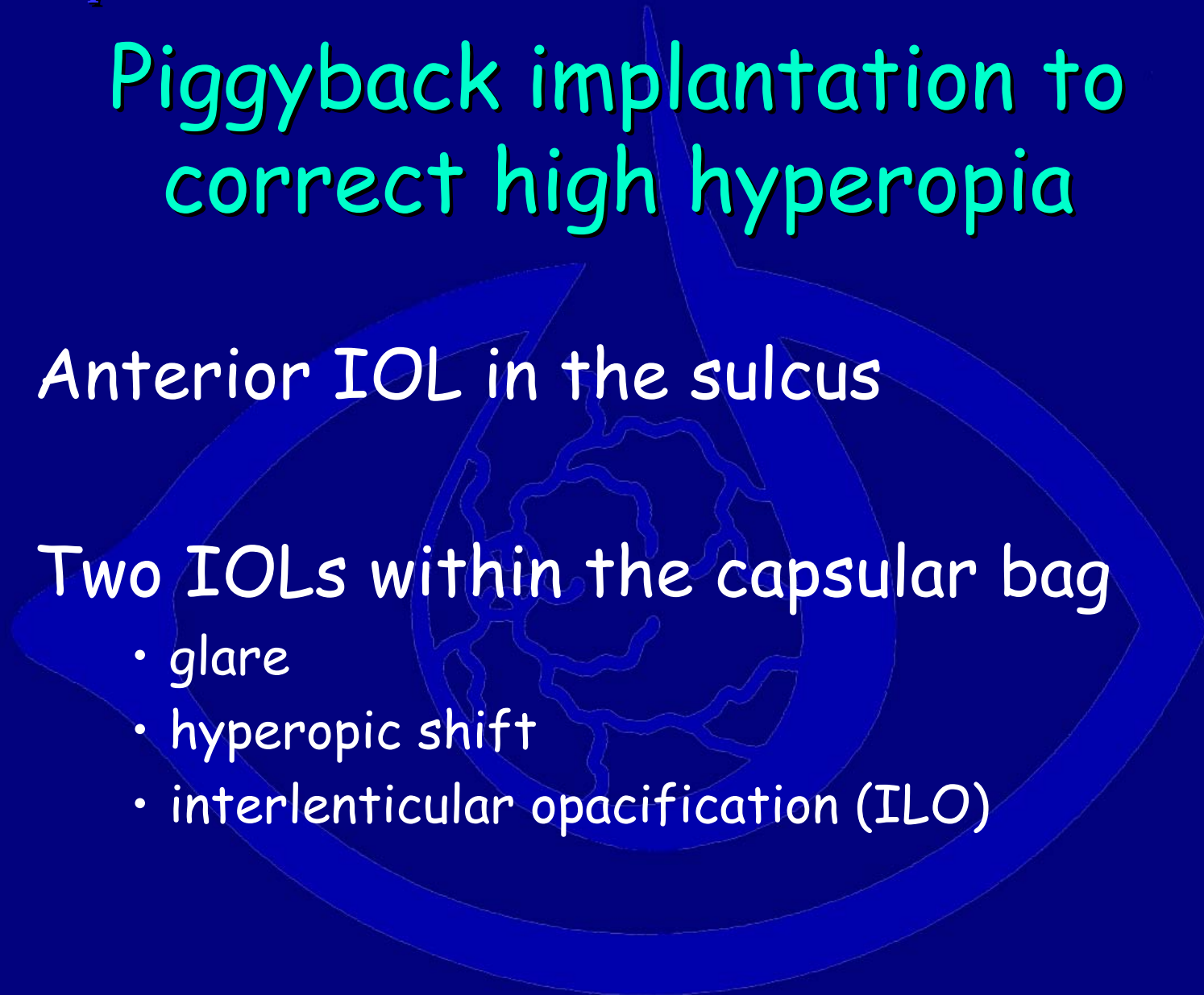
- Moderate hyperopia > 19.00 mm
Noffer A. - SRK/T
- Severe hyperopia < 19.00 mm
Holladay II - Olson
- All formulas present hyperopia shifts
severe hyperopia > moderate hyperopia

Which IOL to choose?

- Moderate hyperopia
 - monofocal IOL
 - piggyback
 - polypseudophakia
- Severe hyperopia
 - monofocal IOL (12 mm)



Piggyback implantation to correct high hyperopia

- Anterior IOL in the sulcus
 - Two IOLs within the capsular bag
 - glare
 - hyperopic shift
 - interlenticular opacification (ILO)
- 

Polypseudophakia: to correct hyperopia. Two lenses within the capsular bag

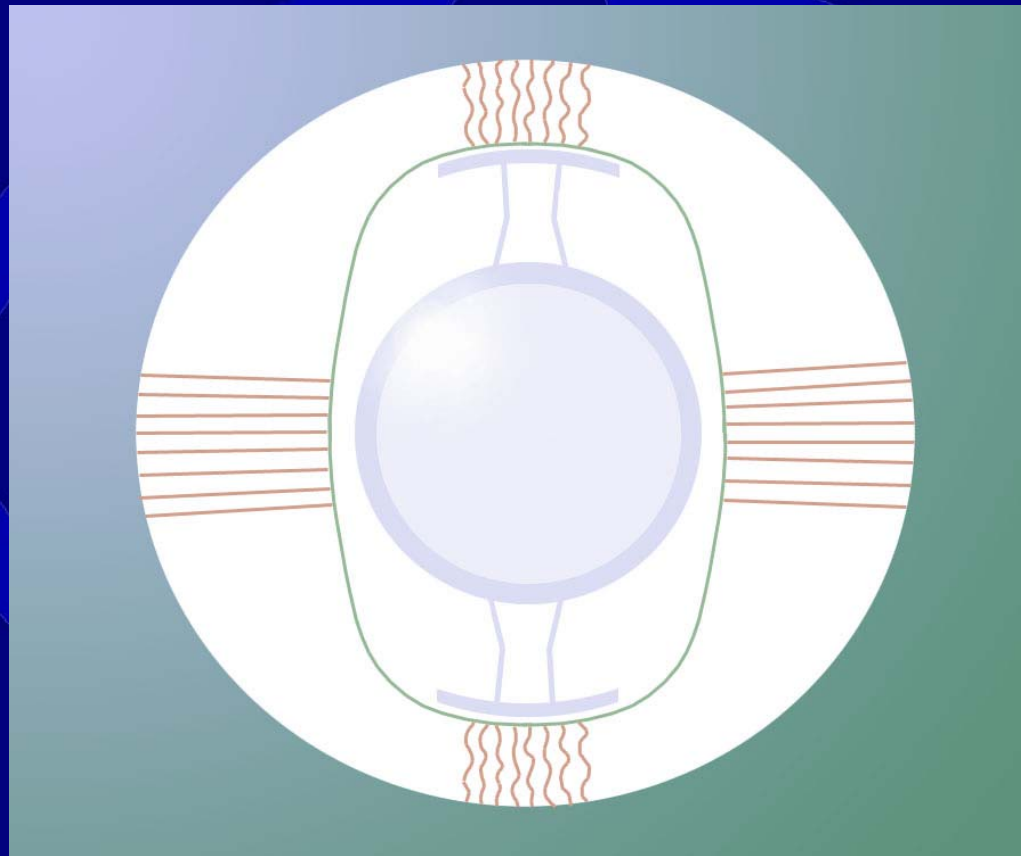
- PMMA IOL's → ILO → ↓ visual acuity
- Acrylic IOL's → ILO → explantation
- AMO in front of a silicone IOL:
6 eyes / 2 explantations

Future ideas: Safarazi IOL?

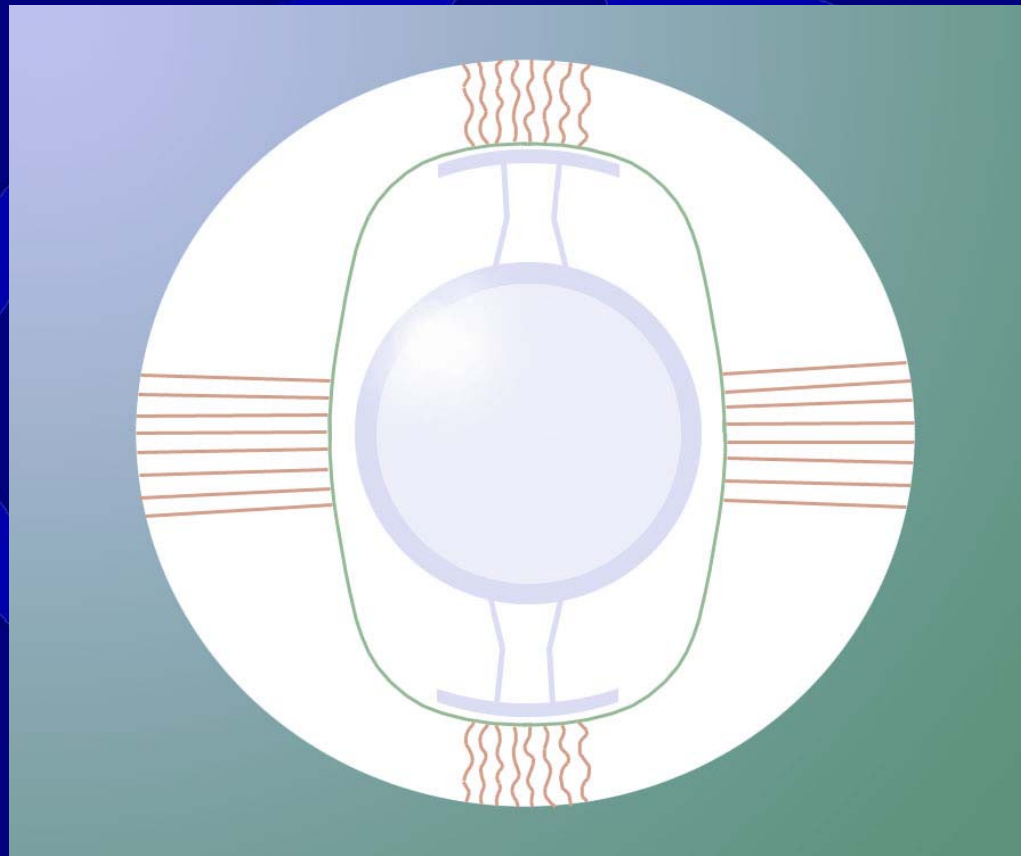


ILO is a major concern

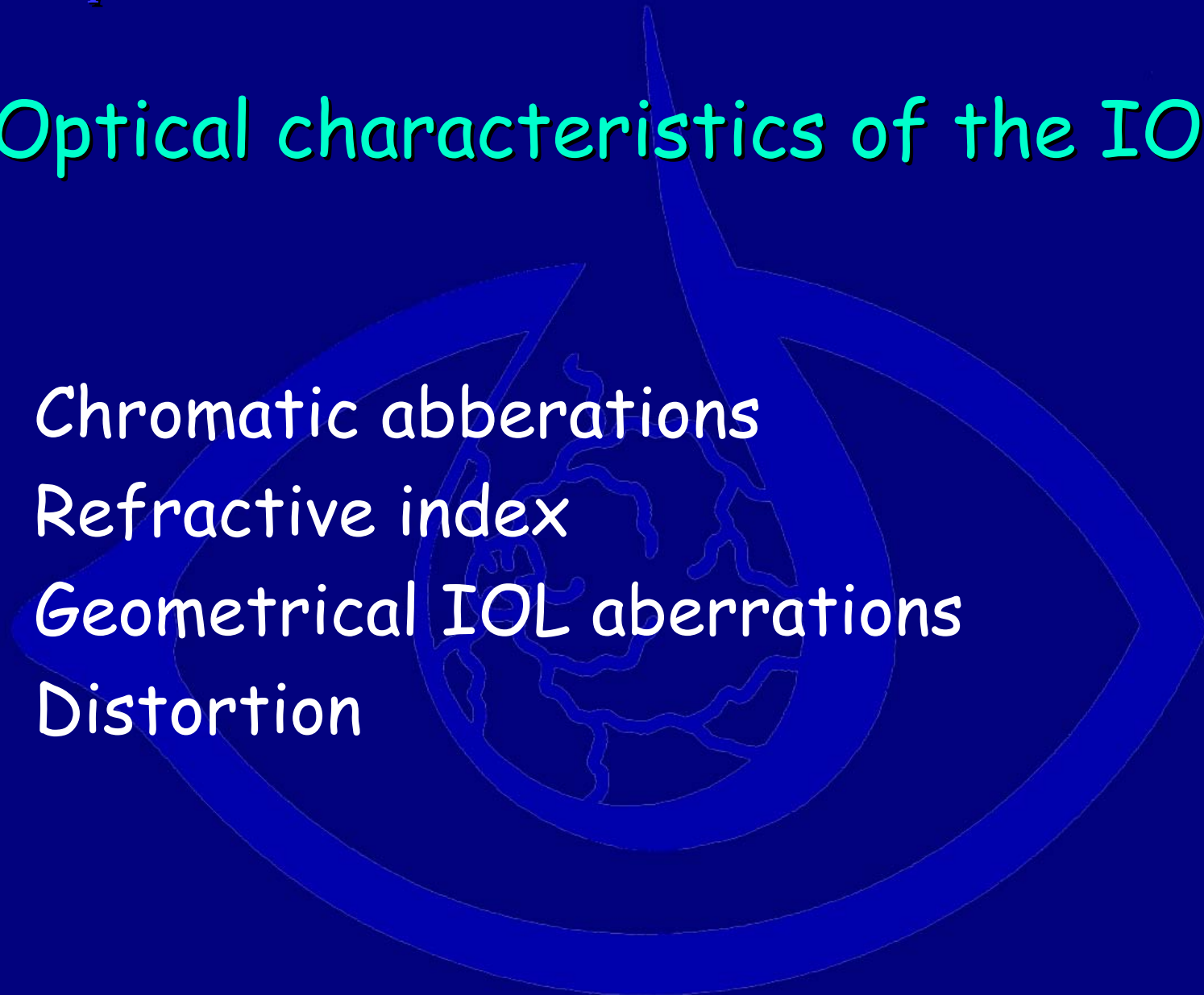
Capsular bag healing process



Capsular bag healing process



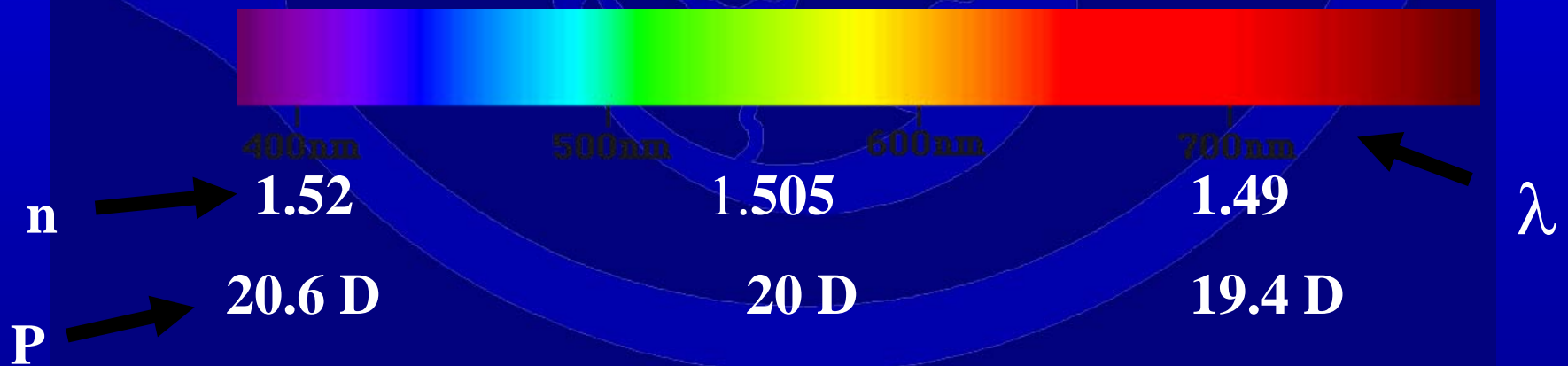
Optical characteristics of the IOL

- Chromatic aberrations
 - Refractive index
 - Geometrical IOL aberrations
 - Distortion
- 
- A large, stylized graphic of a human eye is centered on the slide. The eye is rendered in a dark blue color with a lighter blue outline. The iris and pupil area is filled with a complex, branching pattern resembling a tree or a network of vessels. The overall shape of the eye is elongated horizontally, with a pointed tip at the top and bottom.

20 D acrylic IOL Chromatic aberrations in air

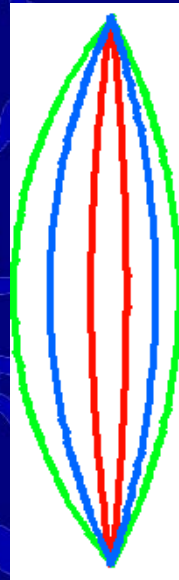
$$P(\lambda) = \frac{2(n(\lambda) - 1)}{r}$$

...for an equiconvex lens



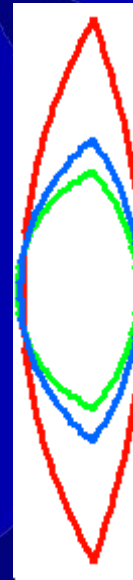
Lens shape versus the refractive index

Same diameter, different thickness



(a)

Same thickness, different diameters



(b)

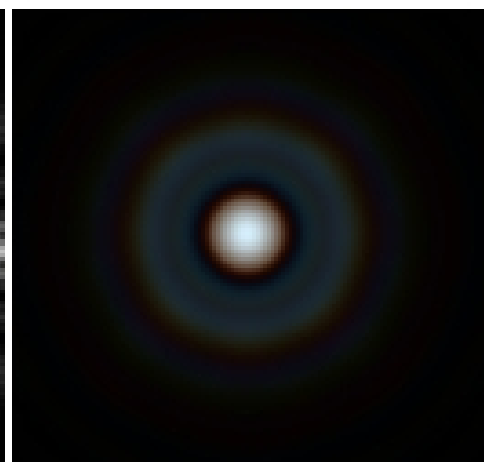
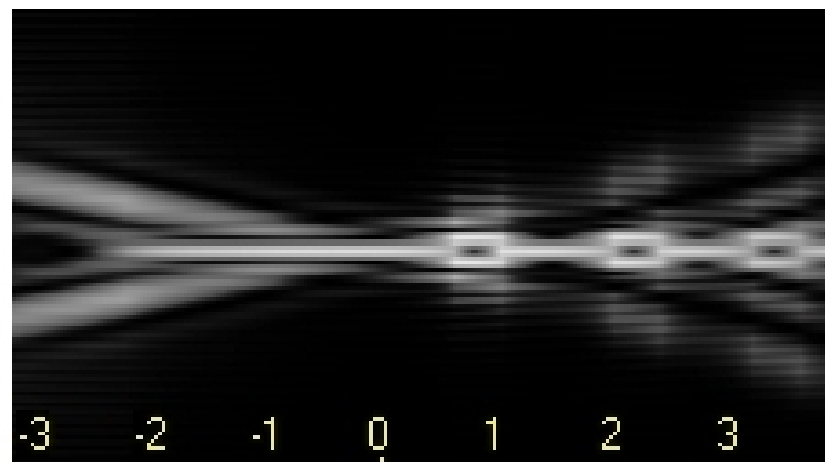
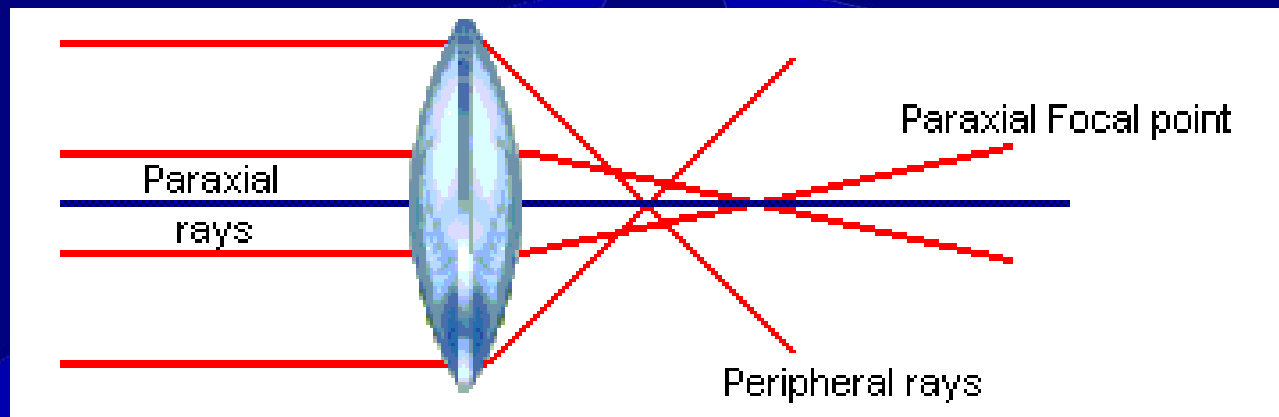
$P = 20 \text{ D}$

red $n = 1.55$

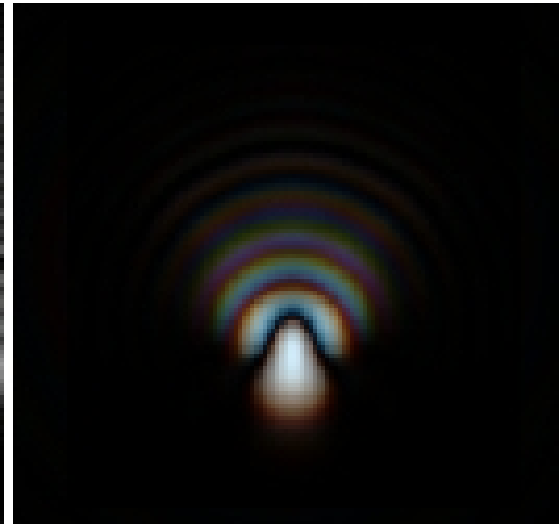
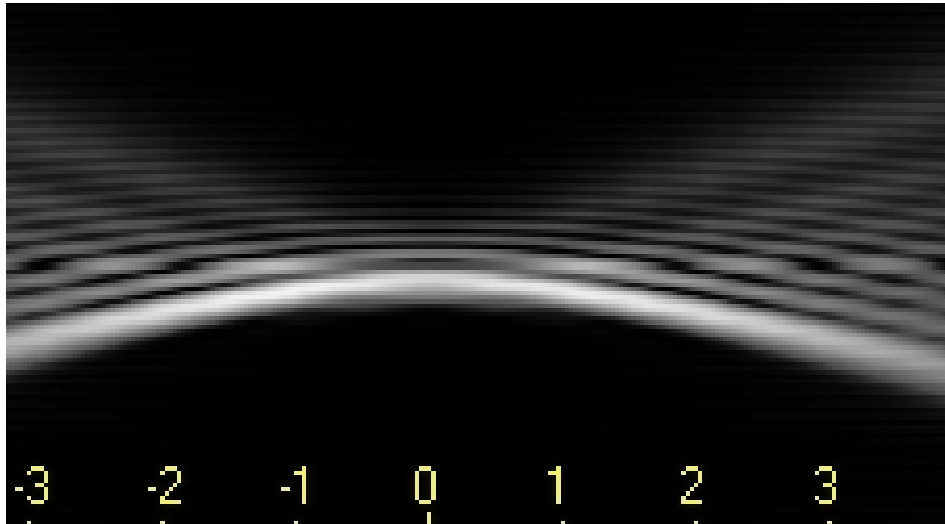
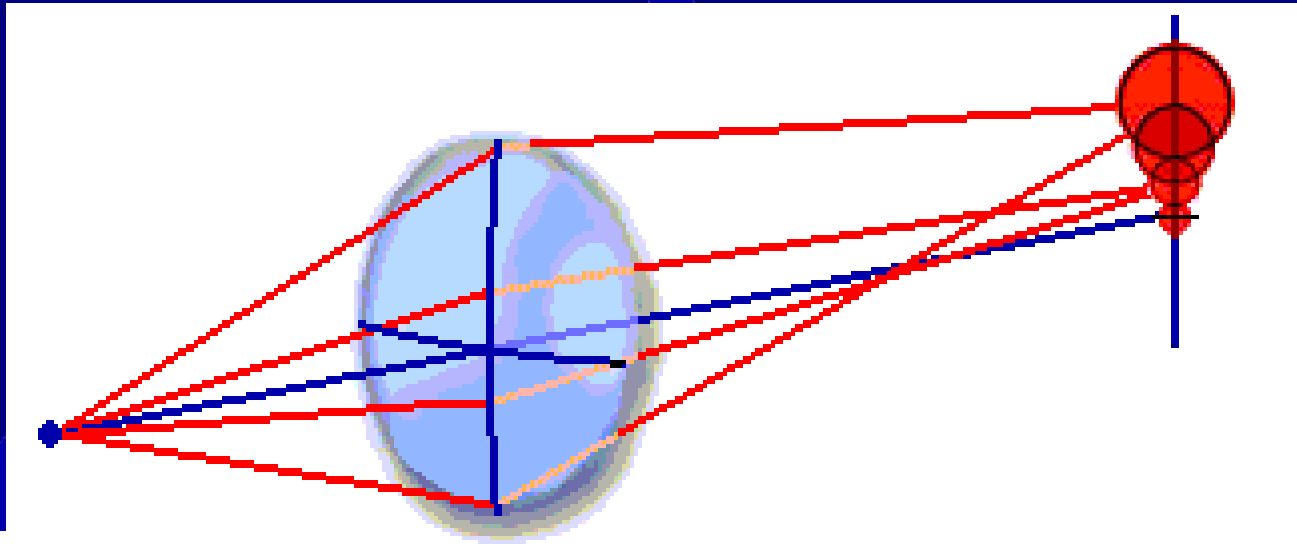
blue $n = 1.41$

vert $n = 1.386$

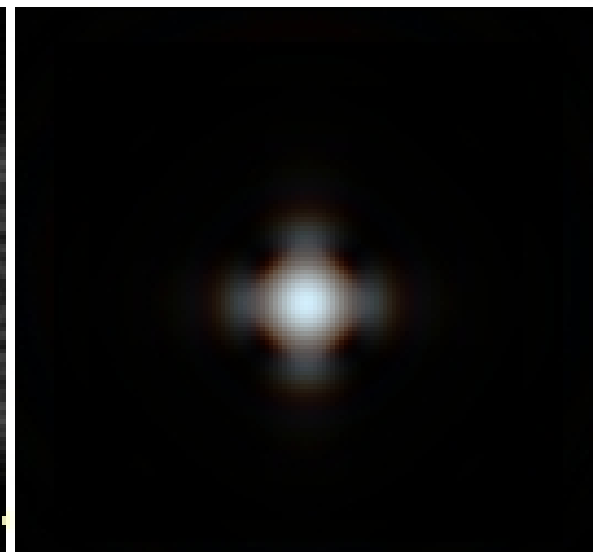
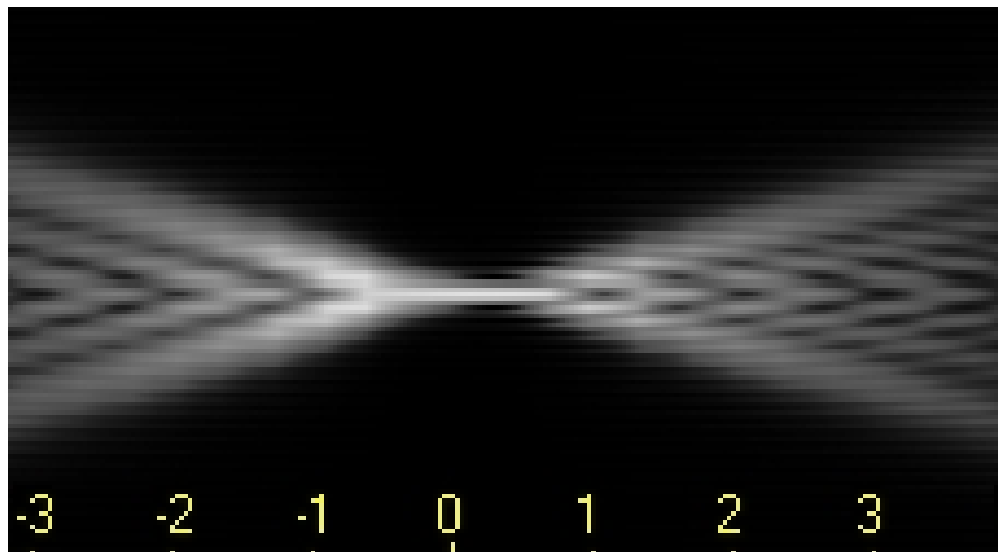
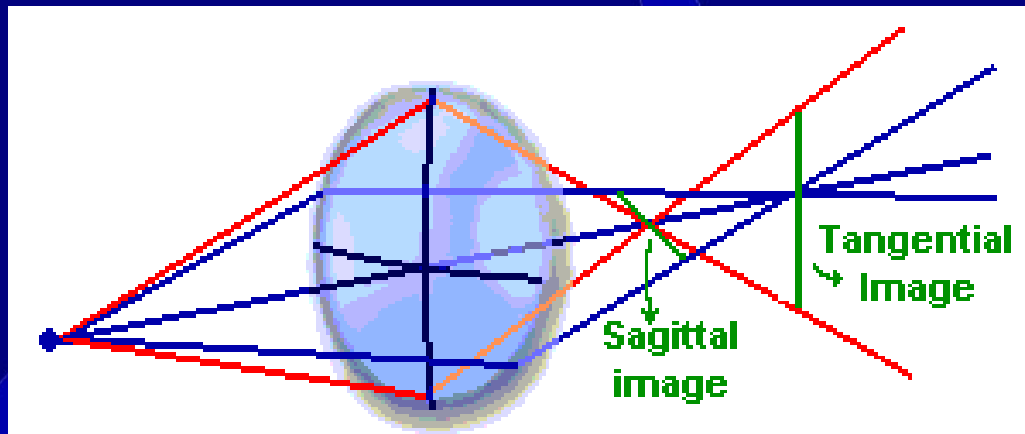
Spherical aberrations



Coma



Astigmatism



Distortion, power, refractive index

For bilateral implantation with different powers or times, be careful for the fellow eye (aniseiconia).

