

# Future of Cataract Surgery

Alan C. Parent, MD, FACS

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# Future of cataract surgery

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Where are we now?

Refractive outcome determined by extensive pre operative work

Patient questionnaires

determines desires

Patient interviews

educate on what's possible

Preoperative testing

refraction.

keratometry

biometry

topography

ocular dominance

IOL formulas and calculations

SRK-T

Holliday 1 and 2

Hoffer

Haigis

Optimization

200+ consecutive cases

regression analysis

IOL selection

monofocal

toric

multifocal

multifocal toric

EDF

EDF toric  
accommodating  
monovision  
mini monovision

our cataract patients must struggle to understand concepts such as focal point, depth of focus, contrast sensitivity, astigmatism, hyperopia, myopia, and presbyopia

#### Intraoperative adjustments

excimer laser (LensX)  
Limbal relaxing incisions  
interoperative aberrometry (ORA)

#### Results

Best case 80%  $\pm$  .5D

Healing variability w IOL movement and refractive drift

Posterior capsule opacification

Patient satisfaction with choice

Ophthalmologists are perplexed by the frequent poor correlation between surgical anatomic success, residual refractive error, and subjective "20-happy" outcomes.

#### Post operative adjustments

IOL exchange

dangerous

poor prognosis after 3 months

Piggy back IOL

only useful for large refractive surprises > 1D

1D steps

LRI at slit lamp for residual cylinder

not very predictable  
Refractive surgery (LASIK/PRK)  
variable outcomes  
ocular surface issues  
high out of pocket cost

Where are we going? The future:

What if all of the measurements and decisions were made post operatively after the cataract was removed, iol is placed, eye has healed?

What if you got the patient back and could simulate all of their refractive options? Plano OU, Mono, Blend, Multi, EDOF

What if patients could experience what it's like to be plano or -1.50 or mono or multi or EDF etc etc and then provide them with that EXACT outcome?

Current issues with available Premium IOLs:

(1) our inability to deliver LASIK-like refractive outcomes, (2) side effects from diffractive presbyopia correcting IOLs, (3) lack of surgeon confidence in being able to satisfy most patients, (4) patient difficulty in understanding the value proposition, (5) lack of patient word-of-mouth endorsement, and (6) lack of referring doctor promotion of premium IOLs.

Imagine if we could not enhance our LASIK patients and only had one "shot" at hitting emmetropia. Patient satisfaction, surgeon confidence, optometric endorsement, and positive patient testimonials would all suffer.

Light Adjustable IOL

RxSight (formerly Calhoun Vision)

The 3-piece RxLAL includes diffusible, photosensitive silicone macromers that are dispersed in the overall silicone matrix.

a slit lamp based digital light delivery device (LDD) system is used to deliver the ultraviolet (UV) light in a precisely programmed pattern to induce a predictable change in the shape and refractive power of the optic

multiple adjustments before "lock in"

a "lock-in" dose is given with the LDD to polymerize all remaining macromer, at which point no further refractive change will occur

Patients wear special UV-blocking spectacles until the lock-in step is completed, after which they are no longer required.

sphere and cylinder

special glasses

once locked in no adjustments

no multi or EDF options

#### Laser Refractive index shaping (RIS)

Uses ultrafast femto laser with 100x less pulse energy

Perfect Lens LLC and Clerio Vision

Rabbit model successful

safe. no inflammation or signs of toxicity

Human clinical trials under way

Fast- takes 23 seconds to change 3.6D

every iol is adjustable

sphere and cylinder

multi and EDF possible

no special glasses

no limit on adjustments i.e. no lock in

patient decides exactly what they want and we give them exactly that.

and if they don't like it we can always adjust no matter the situation:

injury

disease

flakey patient

Could replace LASIK

It is a completely different approach, and will be safer and more flexible than LASIK, and potentially offer new vision correction solution to a broader patient population for whom LASIK is not practical or contraindicated today

The future of cataract surgery will increase the bond between optometry and ophthalmology

optometry experts at determining refractive euphoria

no more unhappy patients :)