Cataracts: A Surgical Revolution

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Demographics

- Leading cause of blindness worldwide (WHO)
- 51% of world blindness (20 million people)
- $3.4 billion each year from Medicare
- Risk factors: female gender, tobacco, diabetes, UV and other radiation, obesity

No financial disclosures
What is a Cataract?

- "Clouding" of the natural lens
- Causes blurry vision
  - Difficulty reading
  - Difficulty driving
  - Glare
  - Double vision/multiple images
  - Loss of color vision
  - Difficulty in the dark

![Anatomy of the Lens](http://www.images.missionforvisionusa.org/anatomy/uploaded_images/ASpelAtlas-775282.jpg)

![Biochemistry](http://www.oculist.net/downaton502/prof/ebook/duanes/graphics/figures/v8/0100/005f.gif)
What Causes Congenital Cataract?

- Genetic Inheritance
  - Autosomal dominant
  - Autosomal recessive
- Intrauterine infection
- Sporadic
- Risk of amblyopia
**Congenital Cataract**

- Polar
- Sutural

**Secondary Congenital Cataracts**

- Rubella
- Persistent Fetal Vasculature

**What Causes Senile Cataract?**

- Increasing age
- Family history
- Diabetes
- Medications
- Radiation
- Trauma
- Eye surgery
Traumatic Cataract

- Blunt Injury
- Electric Shock
- Vossius Ring

Cataracts Associated with Systemic Disease

- Wilson’s Disease (sunflower cataract)
- Diabetes (snowflake cataract)
- Myotonic Dystrophy (Christmas tree cataract)

Pre-Op Evaluation

- Corneal dystrophies
- Pseudoexfoliation

Pre-Op Evaluation

- Retina and Optic Nerve
Primitive Cataract Surgery
“Couching”

Intracapsular Cataract Extraction

The Artificial Lens

Extracapsular Cataract Extraction
Small, Self-Sealing Incision

The Phaco Machine

Foldable Intraocular Lens (IOL)

Phacoemulsification
Goals of Cataract Surgery

- **Primary:** Remove cataract
  - Clear pathway for visual function
  - Assist in treatment of other ocular disease
- **Secondary:** Provide best optical system for individual needs of the patient
  - Lens implant
  - Corneal shape
**Monofocal Lens Implant**

- Mono-focal = single focal point
- Distance vision
- Near vision
- Mono-vision
  - One eye for distance
  - One eye for near
- Current standard of care
- Covered by most insurances

**Premium Lens Implants**

**Multifocal Lens Implant**

- Multi-focal = multiple focal points
- Diffractive light technology allows near and distance focal points

**Multifocal IOL: Benefits**

- Can achieve distance, intermediate, and near vision without glasses
Multifocal IOL: Drawbacks

- Out-of-pocket cost
- Rings and halos
- Decreased image quality
- Difficulty with night vision
- Need implants in both eyes for reading

Accommodative Lens Implant

- Accommodation = movement of the lens to improve near vision
- Crystalens

Crystalens: Benefits

- Can achieve distance and intermediate vision without glasses
- No rings or halos
- No difficulty with night vision

Crystalens: Drawbacks

- Out-of-pocket cost
- Unable to achieve near vision
- Often need laser capsulotomy
- Difficult to exchange
**Astigmatism**

- Astigmatism = Cornea is not spherical
  - Steep axis
  - Flat axis
- Blurry images at all distances

**Toric Lens Implant**

- Toric lens corrects astigmatism
  - Toric monofocal
  - Toric Crystalens
- Out-of-pocket cost

**Limbal Relaxing Incisions**

- Surgical incisions on the cornea
- Alternative to toric IOL for low corneal astigmatism

**Light-Adjustable Lens Implant**

- Decreased power
  - “lock-in”
  - Iris
  - Light

- Increased power
  - “lock-in”
  - Iris
  - Light

- Decreased power
  - “lock-in”
  - Iris
  - Light

*Courtesy of Dan Schwartz, MD, Calhoun Vision Inc.*
Complications

- Endophthalmitis
- Retinal Detachment
- Corneal Decompensation
- Vitreous Loss
- Cystoid Macular Edema
- Choroidal Hemorrhage

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Thank You!