



THE CUTTING
EDGE
OF PEDIATRICS



Shedding Light on Pediatric Cataracts

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A newborn infant presents with bilateral white cataracts. What is the best age to do the surgery?

- A. 4-6 weeks of age
- B. 8-12 weeks of age
- C. 12-16 weeks of age
- D. After 6 months of age



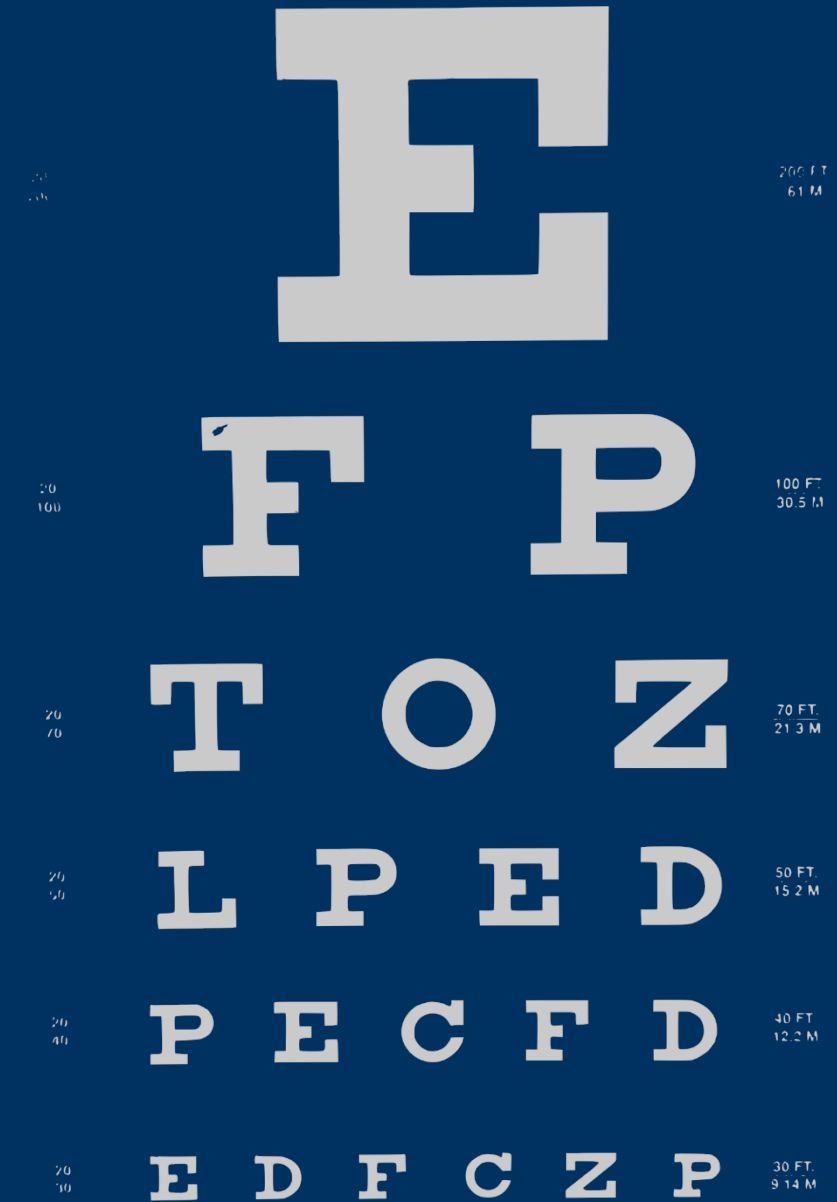
What is the most common etiology for pediatric cataracts?

- A. Hereditary
- B. Idiopathic
- C. Genetic disease
- D. Infection



What most limits vision most after pediatric cataract surgery?

- A. Glaucoma
- B. Amblyopia
- C. Surgical complications
- D. Poor compliance with glasses wear



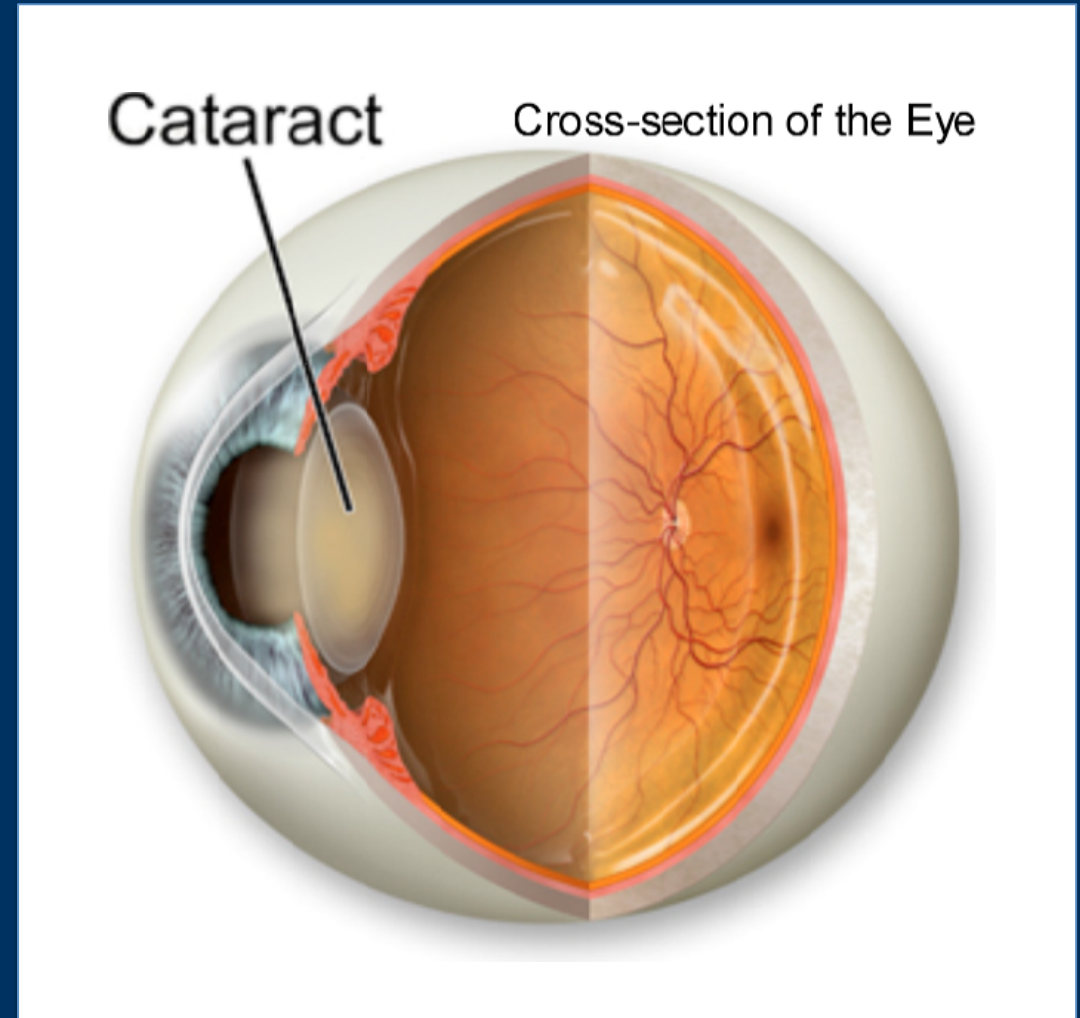
In what situation is a work-up not needed for pediatric cataracts?

- A. Positive family history
- B. Unilateral cataract
- C. Known genetic condition
- D. All of the above



What is a Cataract?

A clouding or opacity of the lens of the eye



Epidemiology of Pediatric Cataracts

- Worldwide: 1 to 15 per 10,000 children
- Prevalance of blindness:
 - 1 to 4/10,000 developing countries
 - .1 to .4/10,000 industrialized countries
- Industrialized countries: 1 to 4 per 10,000
- TCH: 60-80 surgical cases a year

How Do These Patients Present?

- Positive family history
- Leukocoria: white pupil
- Strabismus: esotropia
- Known syndrome or genetic evaluation
- Funny and constant eye movements: sensory nystagmus (age 2-4 months)



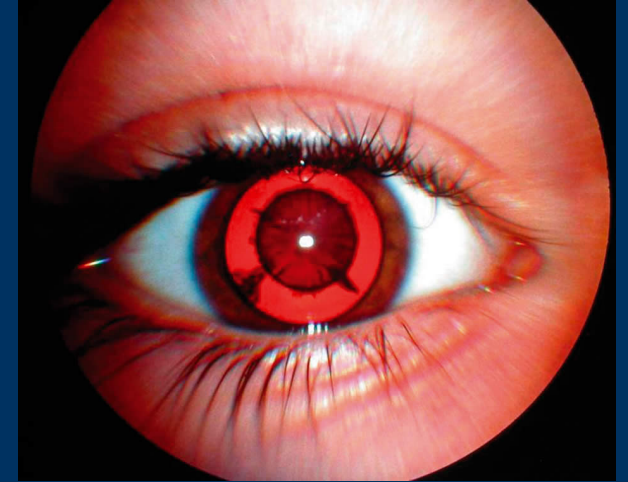
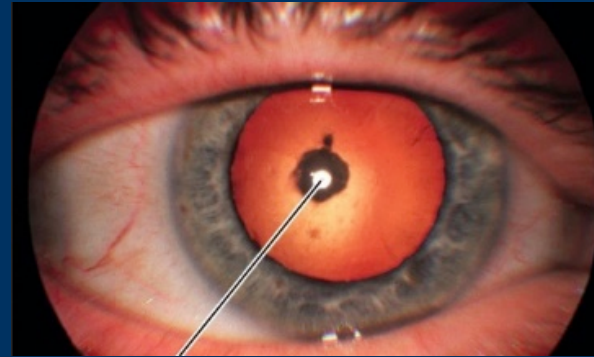
Red Reflex Test: Bruckner Test



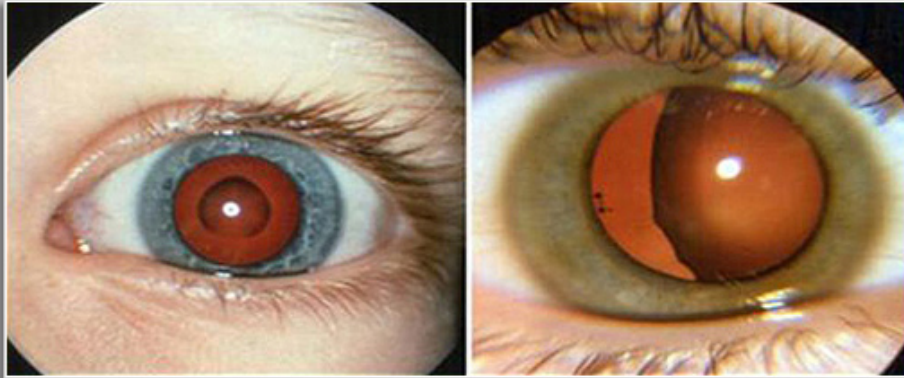
Symmetry
Absence
Disruption



Red Reflex Test



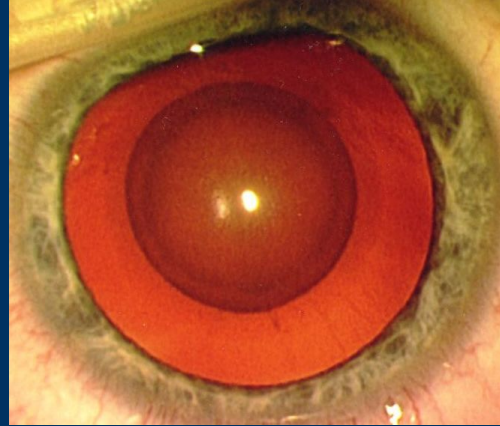
Red Reflex Test



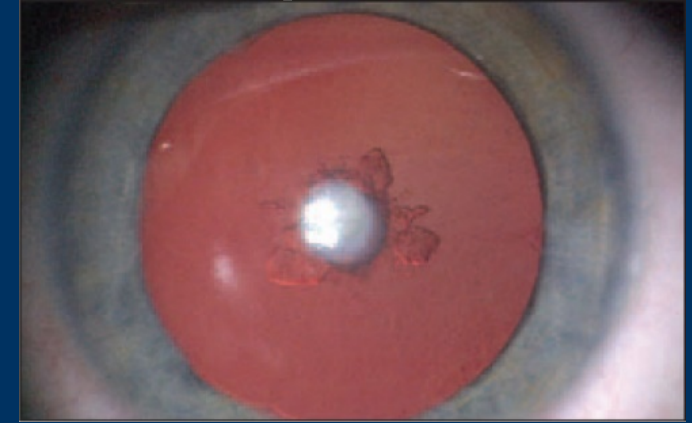
Nuclear cataract



Lamellar cataract



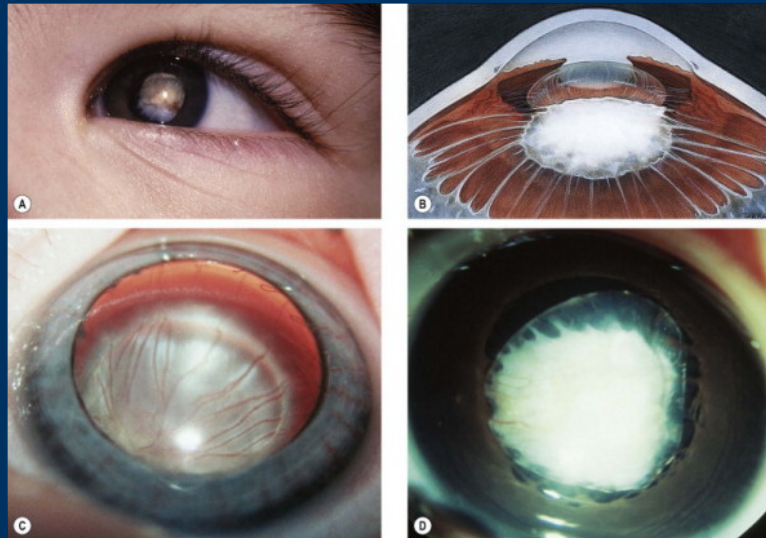
Posterior polar cataract



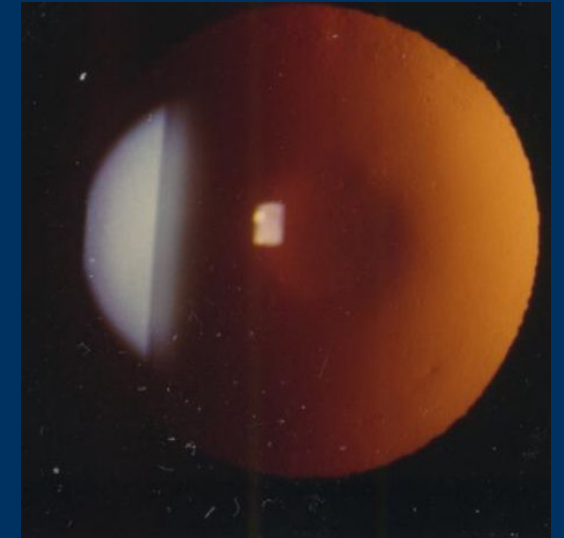
**Anterior
polar
cataract**



Persistent fetal vasculature



Posterior lenticonus



Abnormal Red Reflex

- Cataracts
- High refractive error
- Corneal abnormalities
- Vitreous abnormalities
- Retinal abnormalities: Retinoblastoma



Work Up: Unilateral Cataracts

- Majority idiopathic
- In general, a systemic or laboratory evaluation is not necessary
 - Obtain typical history (PMH, birth history, FH, trauma, systemic disease, medications, etc.)
- Consider TORCH titers (IgM) or VDRL/RPR only if there is anything that raises suspicion
 - Low yield
 - Intrauterine infections would be more likely to cause a bilateral cataract



Work Up: Bilateral Cataracts

- Majority idiopathic or familial, however systemic disease more likely
- Family history is important
 - Consider examining other family members
 - Marked variability can be seen between family members
- Review of systems and pregnancy history
 - Drug exposure during pregnancy
 - Maternal or congenital infection
 - Trauma
 - Congenital anomalies
 - Systemic disease
 - Associated ocular findings
- Baseline physical exam
- Developmental milestones
- Consideration of genetics evaluation if appropriate
- Consideration of laboratory evaluation



Laboratory Work Up

If family history negative and no systemic disease/syndromes being considered, can consider these labs:

- TORCH titers
- VDRL/RPR
- Serum calcium
 - Hypoparathyroidism, hypocalcemia
- Phosphorus
 - pseudohypoparathyroidism
- Urine for reducing substances?
 - Galactosemia



Summary: Work Up

- Most congenital or infantile cataracts are idiopathic
- Bilateral cataracts: common teaching
 - 1/3 idiopathic
 - 1/3 hereditary – 75% autosomal dominant
 - 1/3 associated with disease or syndromes**
- No work up generally needed:
 - Known family history
 - Known associated syndrome or disease
 - Unilateral cataract
- In almost all systemic conditions, there is usually some other exam or historical finding to suggest the associated diagnosis
 - Evaluation targeted to patient

**PEDIG Pediatric cataract surgery outcomes registry: 5.8% with associated medical condition

Pediatric Versus Adult Cataracts

- Eye growth has implications
 - Most occurs between birth to 2 years: eye grows 30-40%
- Amblyopia: “lazy eye” due to deprivation of vision from the cataract
- Other sequelae
- Age of onset affects visual impact (congenital vs. juvenile)

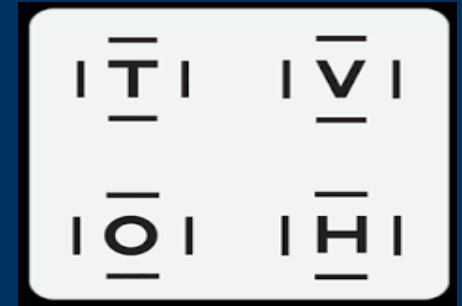
Timing of Surgical Management

- Infants with visually significant cataract
 - Surgery in first 4-8 weeks of life
 - Bilateral cases
 - May be performed 1 week apart
- Older children (>5-7 years) less risk of amblyopia



Timing of Surgical Management

- Is conservative management appropriate?
- Preverbal: retinoscopic (red) reflex
- Older children:
 - Good visual acuity (no symptoms, vision 20/40 or better)
- All patients
 - Extra-axial opacities (not central)
 - Opacities < 3 mm
 - Treatable refractive error responding to treatment
 - Consider trial of patching +/- pupillary dilation in unilateral cataracts when unsure



When to Put in a Lens Implant?

- Controversial: Over 7 months
 - May wait a little longer if bilateral case
- Eye size normal
- No other significant associated ocular abnormalities
- Good lens support (capsule)
- If no lens implant: contact lenses or aphakic glasses
- Will still need glasses and bifocal if lens implant placed

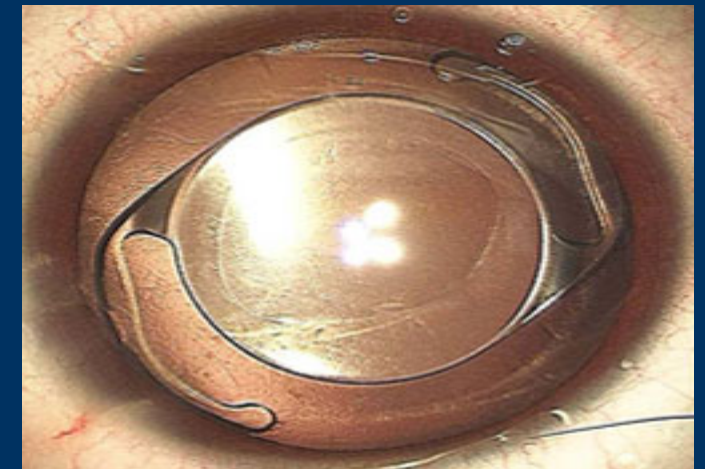
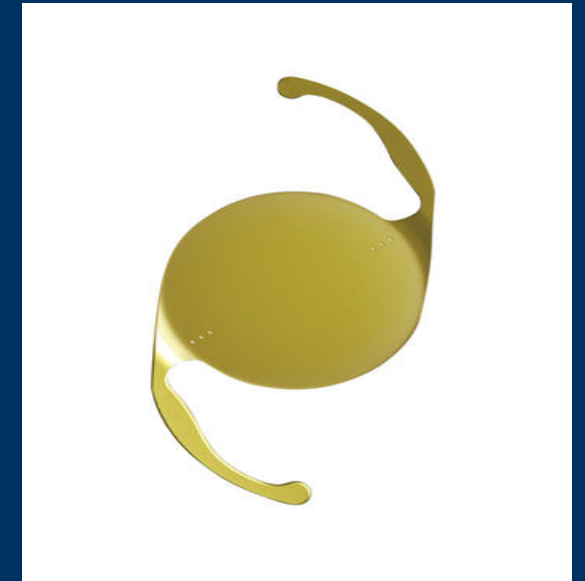


Fig. 2 Intraocular lens in place.

Surgical Considerations

- General anesthesia
- Immediate postoperative considerations:
 - Eye drops (topical steroids, antibiotics, dilating drops)
 - No sports or swimming for 4 weeks
 - Shield wear/eye protection
 - Eye redness



Amblyopia

- Visual outcome in that patient: realistic expectations
- Patching first line of treatment
 - Atropine eye drops less or not effective
- Greatest impediment to improvement of vision
- Requires long-term commitment from parents' standpoint
- Management until 5-7 years of age
- Adhesive eye patches (on skin)
- Patches over glasses (cloth)s
- More choices online



Refractive Management

- Very important: contact lens, aphakic glasses, glasses with bifocals
 - Lens implant versus no lens implant
- Correction of residual hyperopia, myopia, and/or astigmatism
- Significant change in refractive error over time can occur
- Initial correction for near; bifocals after 2 years of age



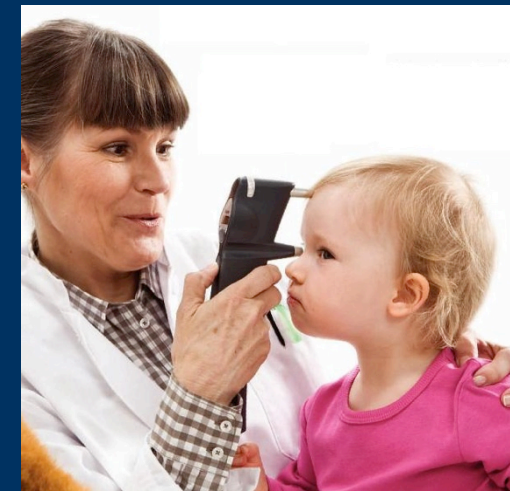
Strabismus

- Lens implant does not prevent development of strabismus
- Percent of patients developing strabismus over time increases
 - 24.6% (baseline) to 70.4% (12 months after surgery)
 - 60% of patients without strabismus developed it over time
- Strabismus less likely if cataract removed at an earlier age
 - Trend toward better acuity in patients without strabismus
- Esotropia most common strabismus pattern
- Surgery can be performed after amblyopia treatment initiated



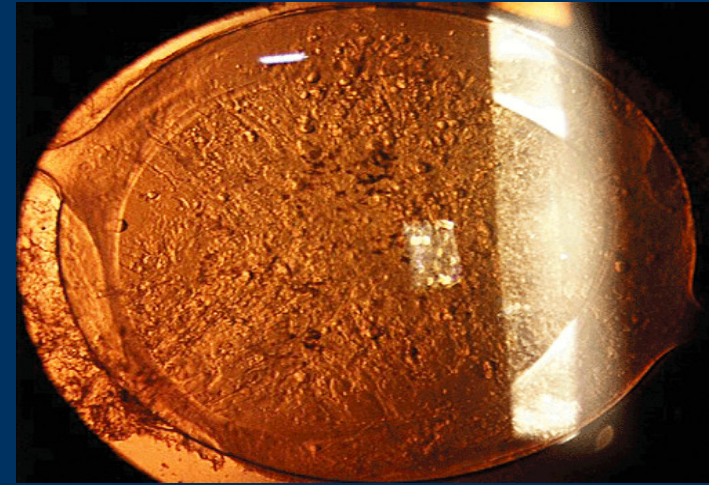
Aphakic Glaucoma

- Important and frequent complication of pediatric cataract surgery
 - Mechanism unclear
- Wide range of reported frequencies
 - 15% to 21%
 - Possible risk factors: secondary membrane surgery, small cornea, family history
 - Most consistent risk factors: cataract surgery in first year of life and small corneal diameter
- Treatment with drops and/or surgery
- Long-term monitoring: challenging in kids
- Examinations under anesthesia may be required



Visual Axis Opacification or “Secondary Cataract”

- Rate high in children
 - Literature: 44-100% within first year
- Higher and earlier occurrence in younger children
- Laser versus surgical treatment
 - Nd:Yag laser capsulotomy for older, cooperative children
 - Surgical capsulotomy in younger children



**Thank you for
your attention!**