

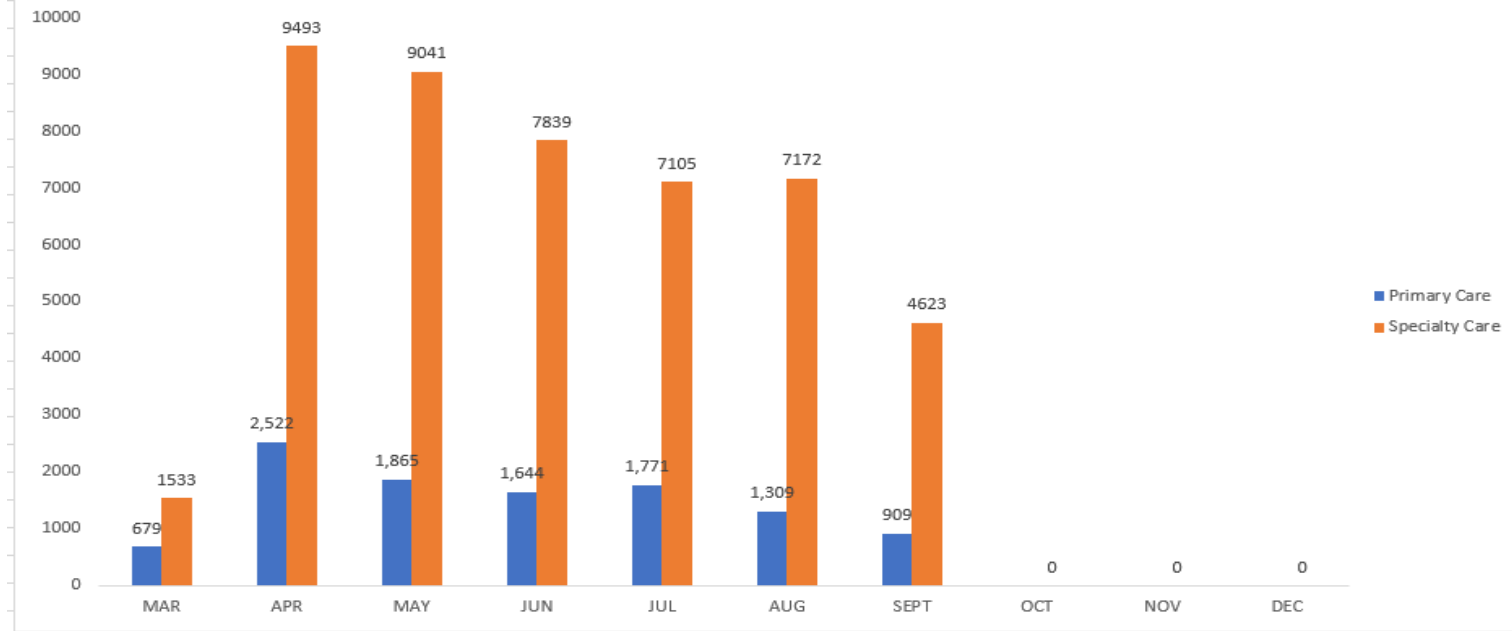
CHOC Children's Business Development
Virtual Pediatric Lecture Series

**Vision Screening: Refresher for
Primary Care Clinicians**

Monday, September 28, 2020 from 12:30 – 1:30 PM (PST)

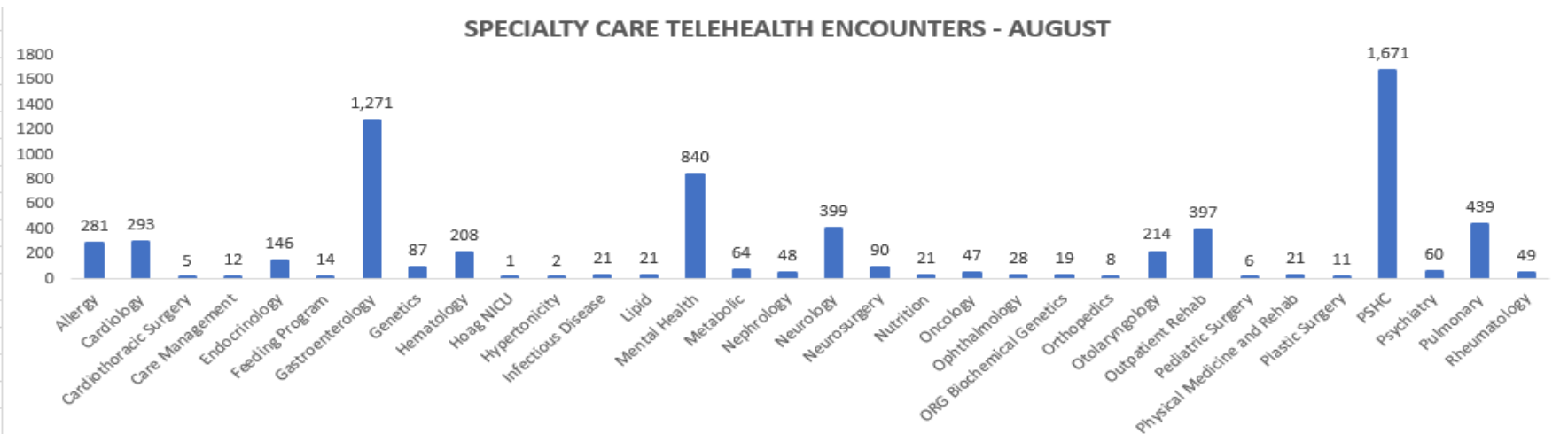
WELCOME

COVID-19 TELEHEALTH UTILIZATION



COVID-19 Utilization	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
Primary Care	679	2522	1865	1644	1771	1309	909	0	0	0	10699
Specialty Care	1533	9493	9041	7839	7105	7172	4623	0	0	0	46806
Total	2212	12015	10906	9483	8876	8481	5532	0	0	0	57505

SPECIALTY CARE TELEHEALTH ENCOUNTERS - AUGUST





Vision Screening: Refresher for Primary Care Clinicians



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Objectives

- Development of Vision
- Measurement of Visual Acuity in a Child
- Recognition and Management of Common Pediatric Ocular Disorders

Development of Vision

Newborns

- Difficult to arouse
 - Pupillary response
- Visual acuity not fully developed
- Fixation present



Development of Vision

4 Months

- Focus on smaller objects
- Alignment of the eyes becomes stable
- Begins development of depth perception
- Able to look from near to far and back again



Development of Vision

8 Months

- Adult-like clarity
- Good depth perception
- Prefer close, see distant
- Vision = 20/100
- VEP vision = 20/20



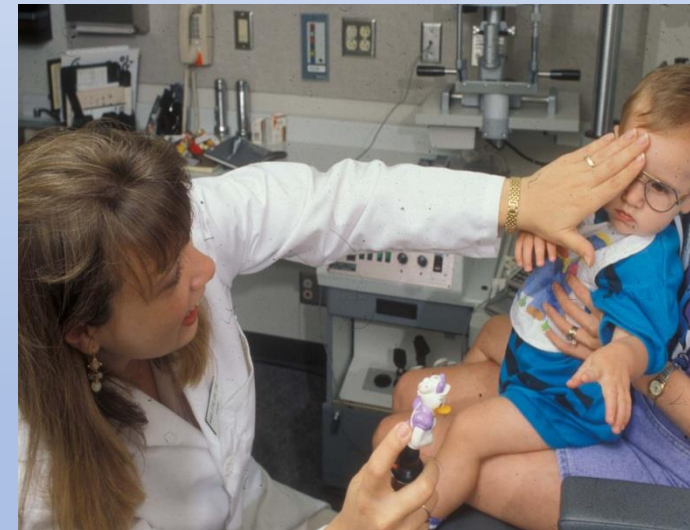
Measure of Vision in Infants

Quantitative

- Preferential Looking test
- Optokinetic Nystagmus
- Visual Evoked Potential

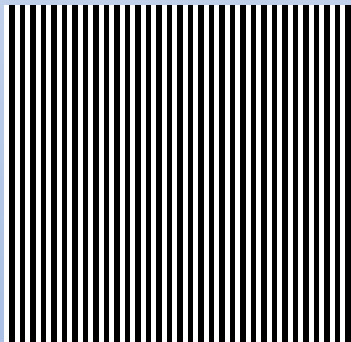
Qualitative

- Fixation and Following



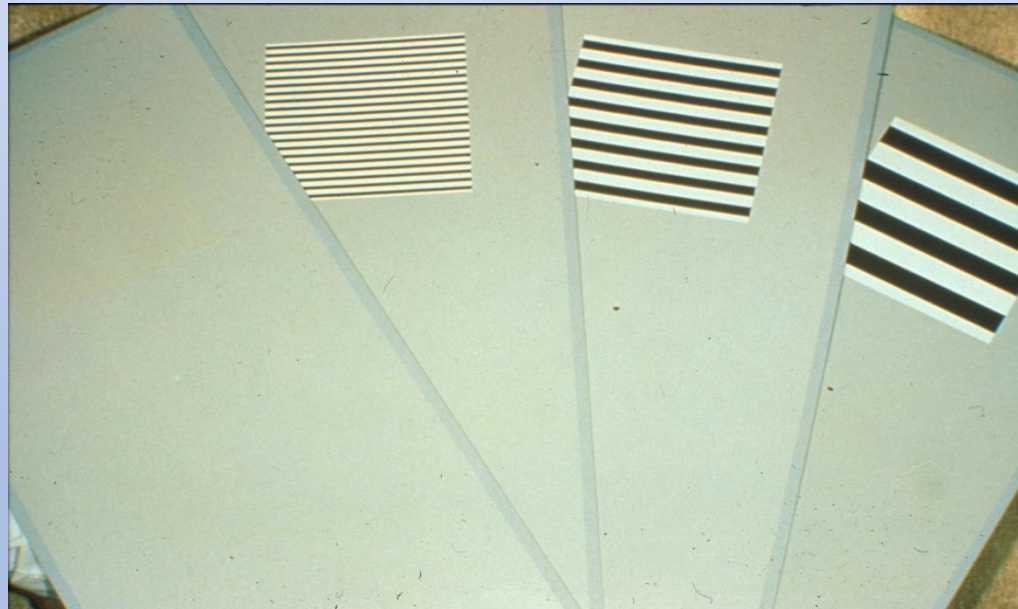
Preferential Looking Test

Infants prefer to look at patterned stimuli rather than uniform one



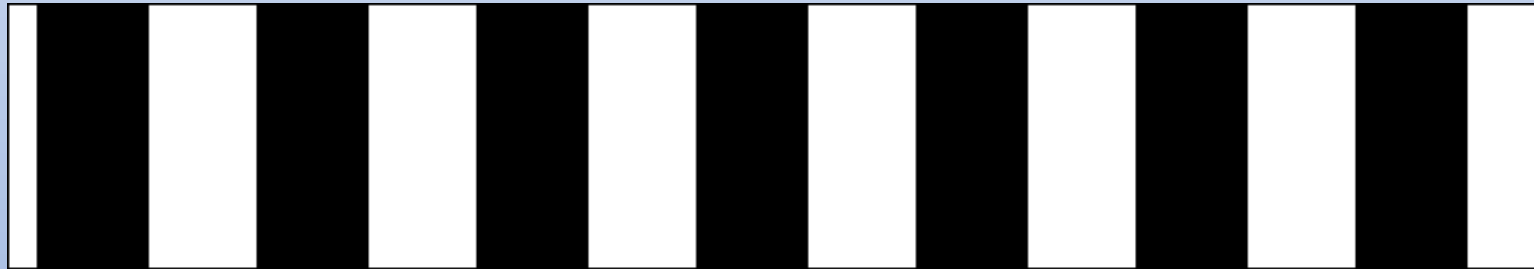
Teller's Visual Acuity Cards

Cards shown in descending order of graded stripes determine response by child's behavior to stimuli

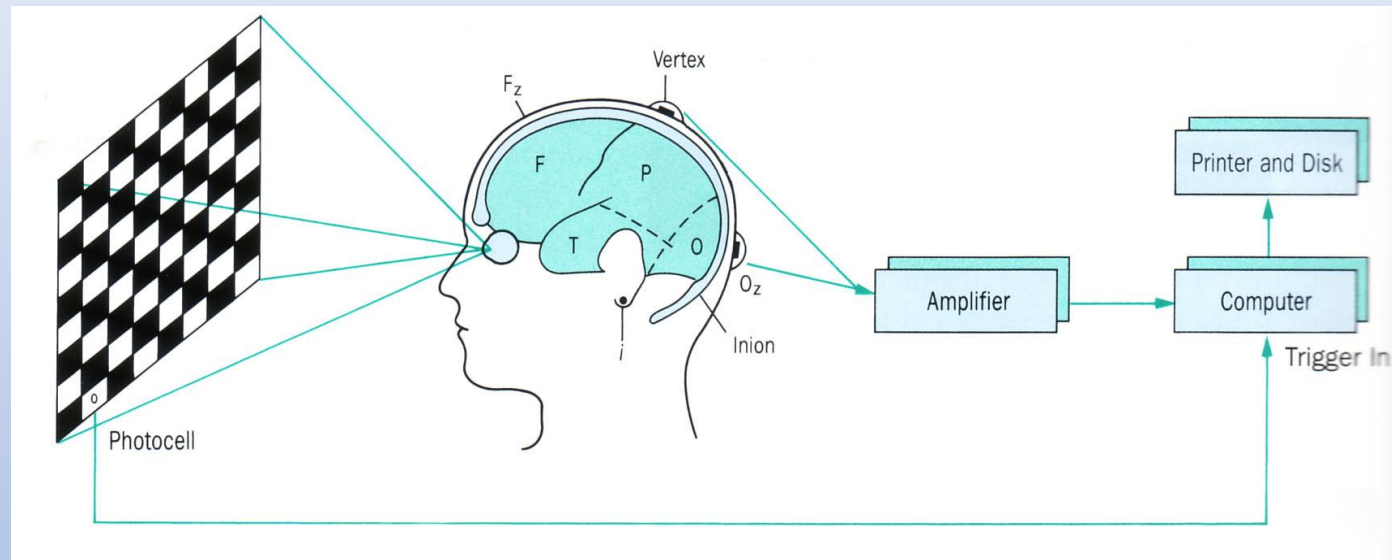


Optokinetic Nystagmus

Objects passing across the field of vision producing a pursuit movement followed by a refixation saccade



Visual Evoked Potential



- Scalp electrodes record EEG over occipital cortex
- Stimulus (checks in this picture) are flashed
- Computer extracts stimulus-related EEG signal

When Should Children Have Their Eyes Checked?

- **Ocular Symptoms**

- Crossed or misaligned eyes after 4 months
- White pupil (Leukocoria)
- Enlarged corneas
- Persistent tearing or discharge
- Drooping of the lid (ptosis)
- Dancing eyes (nystagmus)
- Unequal pupil or eye size

Required

At Risk Children

- Systemic disease: NF-1, Batten's Disease
- Family history: High Myopia
- Low birth weight
- Maternal drug use



No Symptoms



When do you have their eyes checked?

AAP Policy Statement

- Children should have an age appropriate assessment for eye problems in the newborn period and then at all subsequent well-child visits
- Early detection and prompt treatment of ocular disorders in children is important to avoid life-long visual impairment

VISION SCREENING

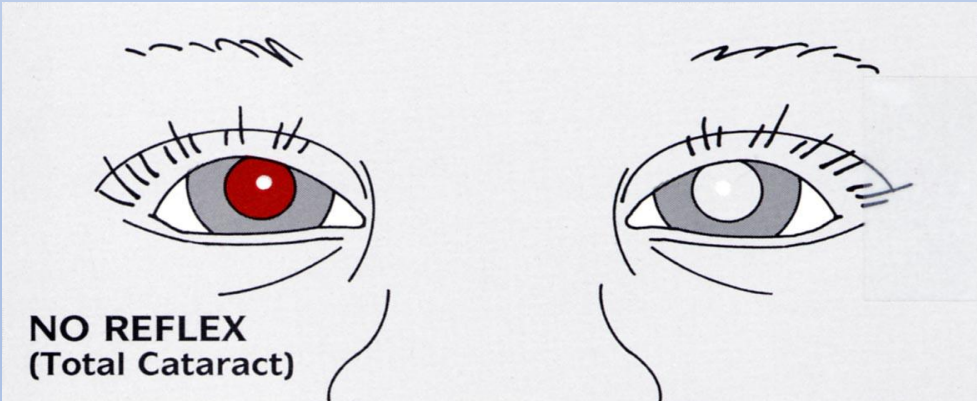
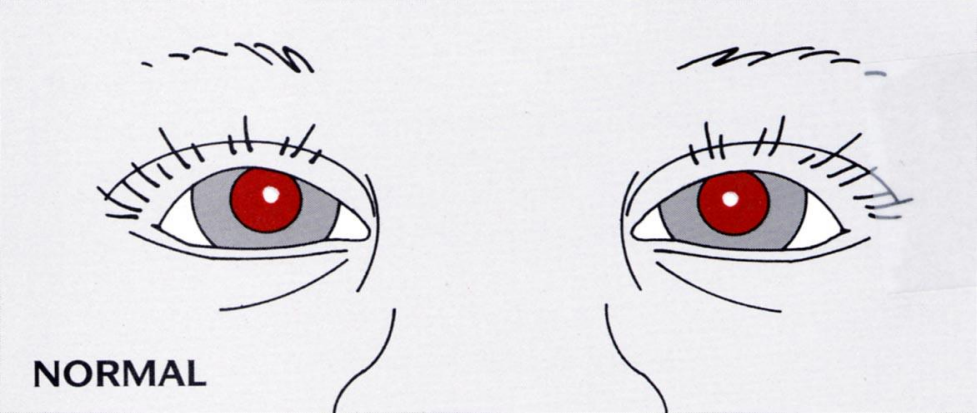
Goal of vision screening is to detect subnormal vision or risk factors that threaten visual development, preferably at a time when treatment can be initiated to yield the highest benefit.

Newborn Evaluation

- Check for External Eye Abnormalities
- Pupil Examination
- Red Reflex Examination



Red Reflex Test



Etiology of Cataracts in Childhood

- **Inherited**

Autosomal Dominant

- **Metabolic**

Galactosemia

- **Chromosomal**

Trisomy 21

- **Intrauterine Infections**

TORCH infections

Trauma

Steroid Induced

Renal Diseases

Lowe's, Alport

Muscular Diseases

Myotonic Dystrophy

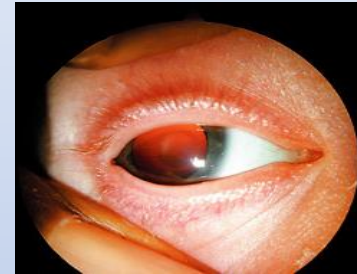
Pediatric Cataracts



Intrauterine
Toxoplasmosis



Down's
Syndrome

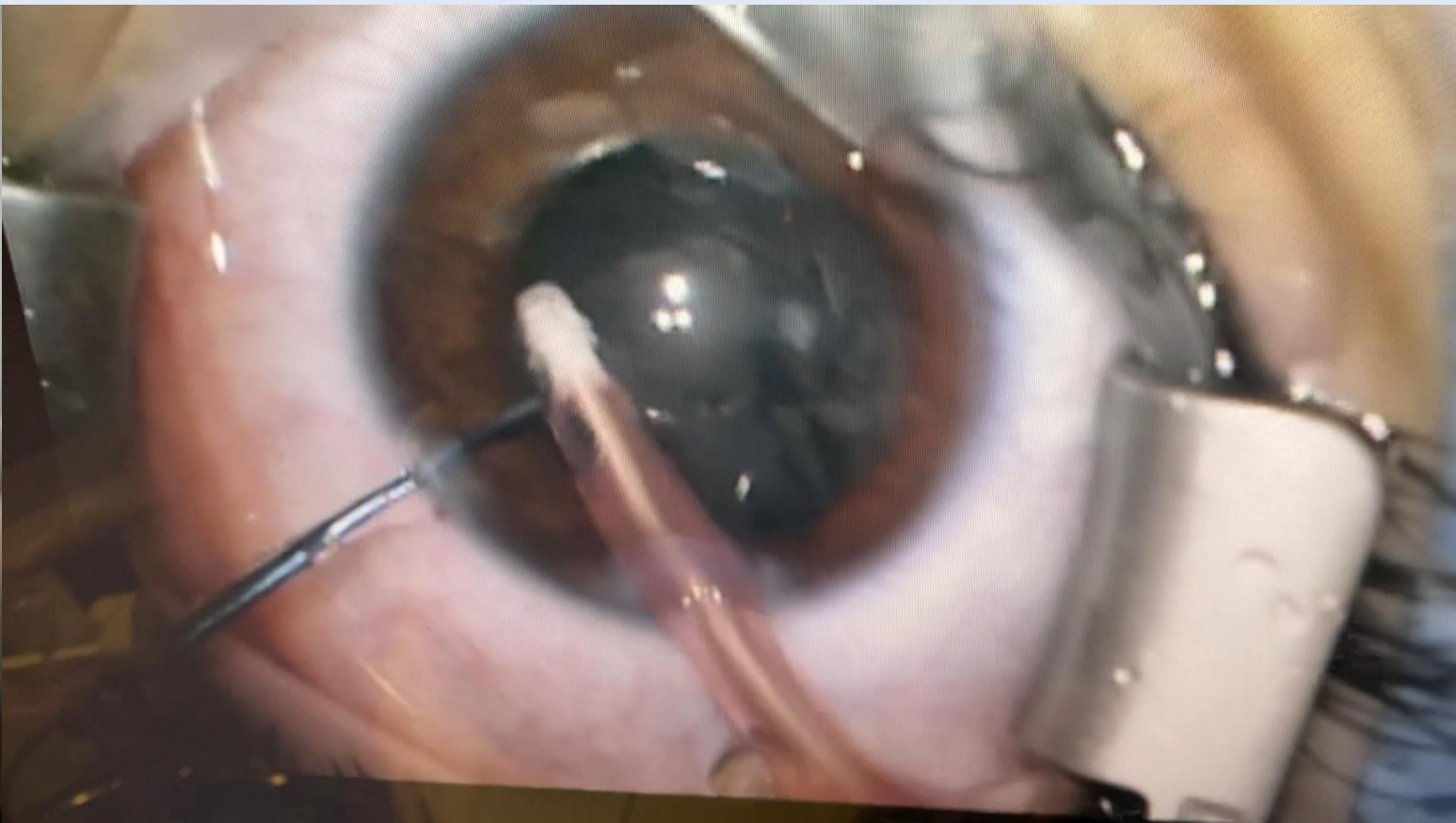
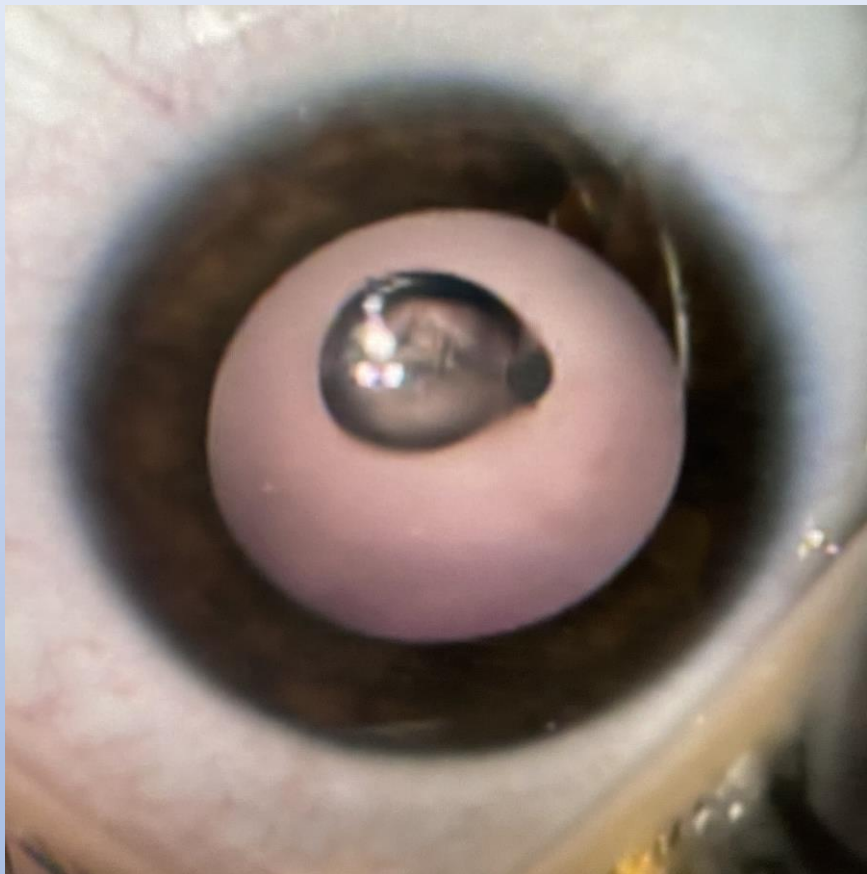


Galactosemia
(Oil droplet cat.)

Pearls

- Despite best T/t 1/3 rd U/L cataracts have poor visual prognosis
- U/L cataract is challenging: Surgery after 6 weeks of age is less likely to result in good VA
- Early diagnosis and prompt management
- Any doubt about the reflex, immediate referral to Ophthalmologist

Congenital Cataract and its Removal



12-36 Months

- Check for External Eye Abnormalities
- Pupil Examination
- Red Reflex Examination
- Ocular motility assessment
 - Ocular movements in all gazes
 - Cover test
 - Hirschberg test
- Visual Acuity Testing: Photoscreening



Eye Movements in All Gazes Dissociated Vertical Deviation



Photoscreening



6.0 mm ↑ 1° → 4°		77 mm		6.0 mm ↑ 1° → 0°
OD	- CYL		OS	
SE: -0.25		SE: +1.50		
DS: +4.00	DC: -2.00	Axis: @99°	DS: +1.75	DC: -0.75
		Axis: @16°		
Complete Eye Exam Recommended Hyperopia (OD), Astigmatism (OD), Anisometropia				
Robert Smith 08/18/2014 2:23 PM				Home 09/04/2014
5.9 mm ↑ 2° → 0°		69 mm		5.9 mm ↑ 3° → 1°
OD	- CYL		OS	
SE: -0.50		SE: -0.25		
DS: -0.25	DC: -0.50	Axis: @10°	DS: 0.00	DC: -0.25
		Axis: @34°		
Screening Complete All measurements in range				
Mono	Edit	Summary	Retry	Print
				Home

Refer...

- Strabismus
- NLD obstruction
- Horner Syndrome
- Ptosis
- Failed Vision screening

36 months - 5 years

- Check for External Eye Abnormalities
- Pupil Examination
- Red Reflex Examination
- Ocular motility assessment
 - Cover test
 - Hirschberg test
- Visual Acuity Testing (preferred) or Photoscreening

Visual Acuity Referral Guidelines

- 2- 3 years: recognize optotypes on 20/50
- 3-4 years: recognize optotypes on 20/40
- Beyond 4 years: Better than 20/40
- VA \leq 20/40 OU beyond 4 years
- 2-line discrepancy between the eyes.

Strabismus



Misalignment of Visual Axis of one eye relative to other

Strabismus Classification

Direction of misalignment



Esotropia



Hypertropia



Exotropia

Accommodative Esotropia

Underscores the importance of dilated eye exam with retinoscopy in every child with strabismus



Head Tilt from Superior Oblique Palsy



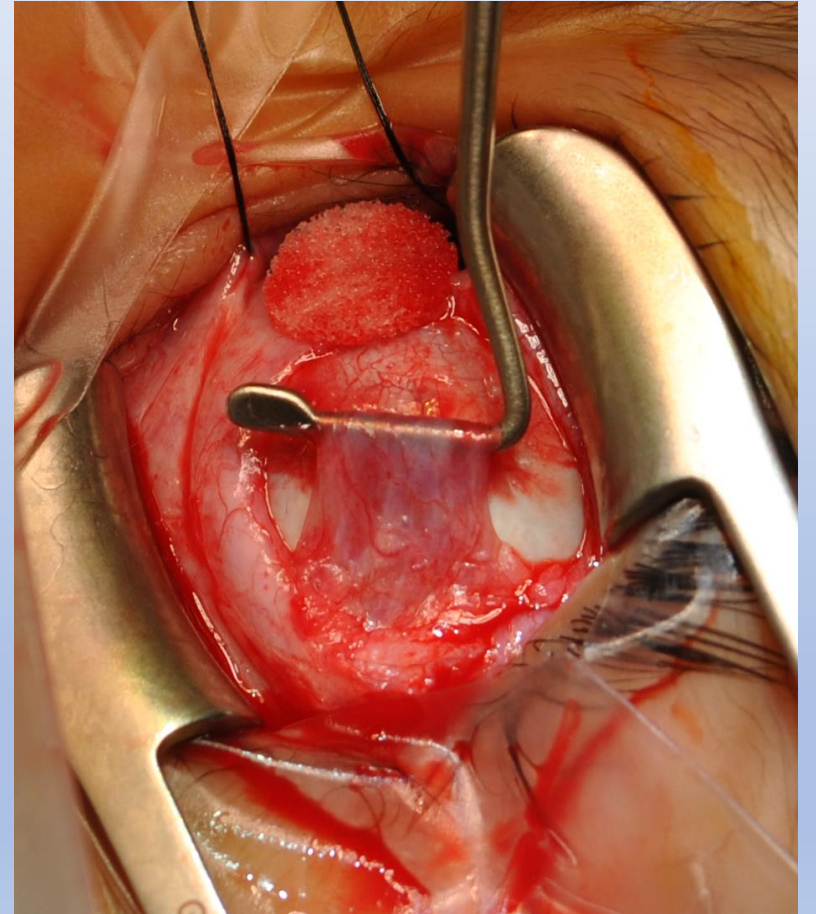
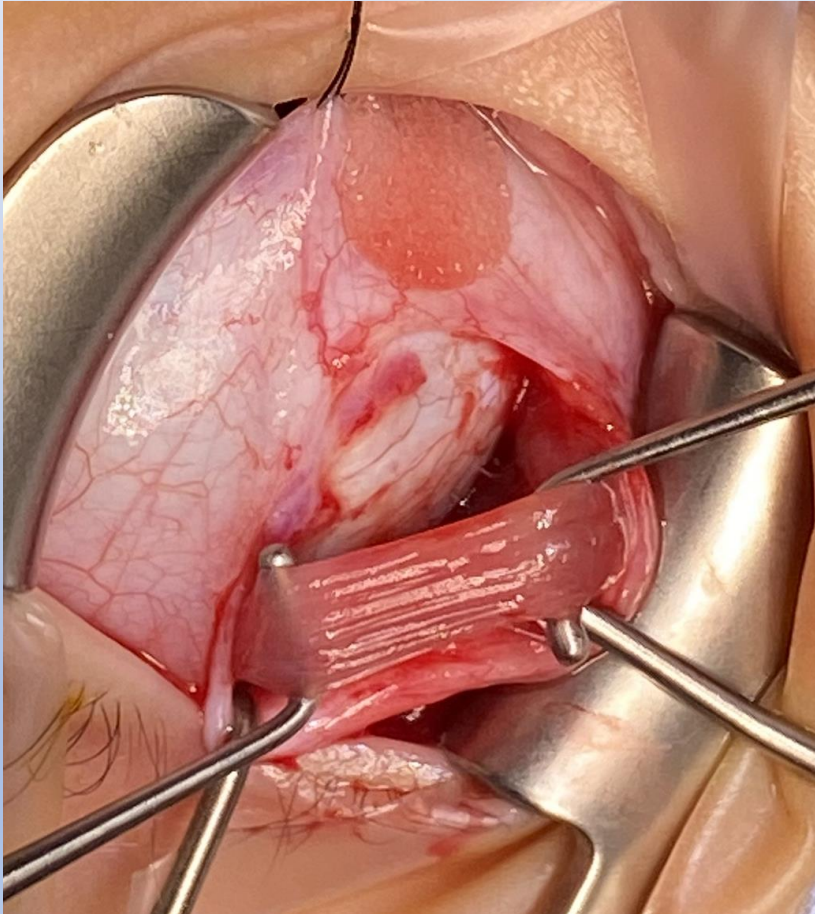
Torticollis from Strabismus



FACE TURN FROM NYSTAGMUS



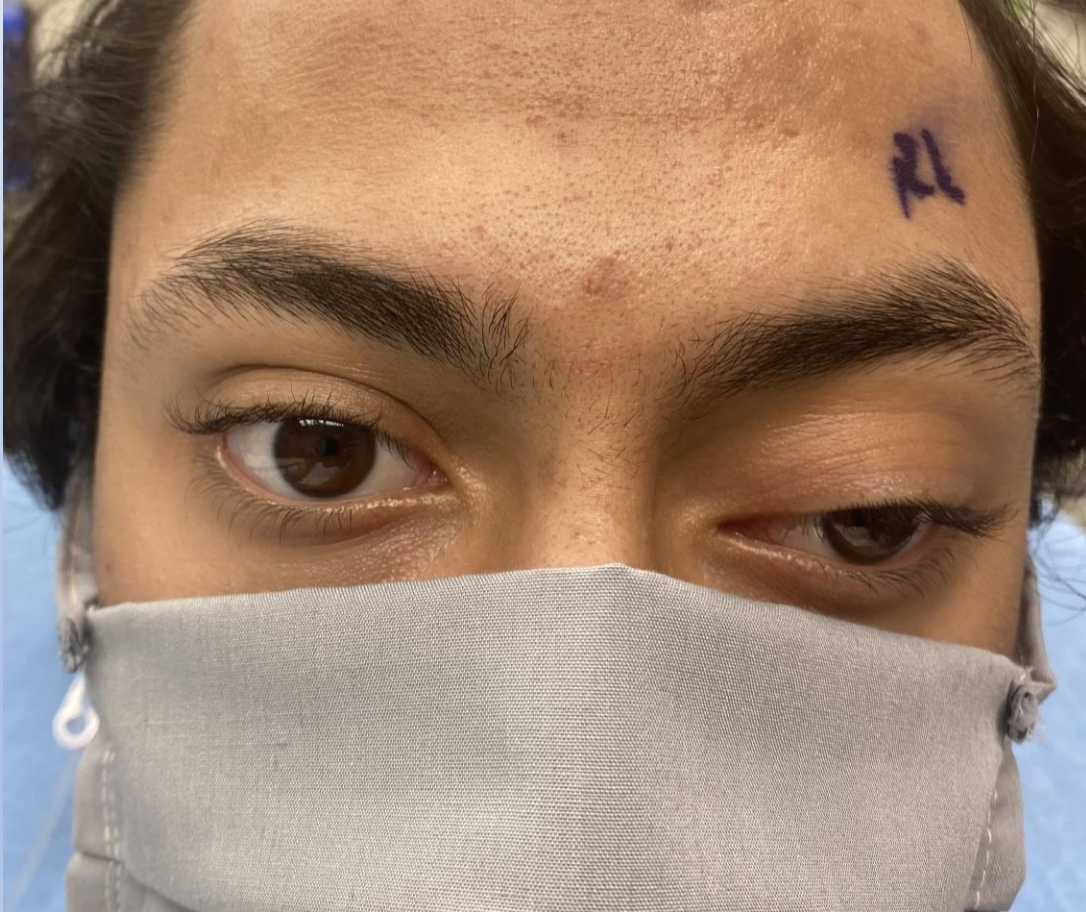
Strabismus Surgery on Oblique and Recti Muscle



Congenital Third Nerve Palsy



Primary Gaze Alignment POD#7



Decompensated Esotropia and Diplopia “Excessive Convergence”

Large Angle Esotropia

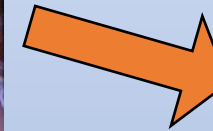
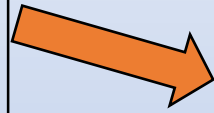


Excellent Alignment Post-op



Importance of Strabismus

**Vision loss
may lead to
strabismus**



**May result
in vision
loss due to
amblyopia**

**CNS lesion
may cause
strabismus**

Amblyopia

- Decrease in BCVA in one or both eyes
- No apparent organic abnormality
- Lack of stimulation of the immature visual pathways

Causes of Amblyopia

Precipitating factors

- Strabismus
- refractive error
- stimulus deprivation



Management of Amblyopia

- Correct precipitating factors
 - i.e. surgery, glasses
- “Stimulate” eye
 - occlude or penalize normal eye
- Treat in first decade of life; ideally as young as possible



Congenital Nasolacrimal Duct Obstruction

Onset within first few weeks of birth

Symptoms

- Epiphora
- Mattering (mucopurulent discharge)
- Rarely conjunctivitis



Treatment of Congenital Dacryostenosis

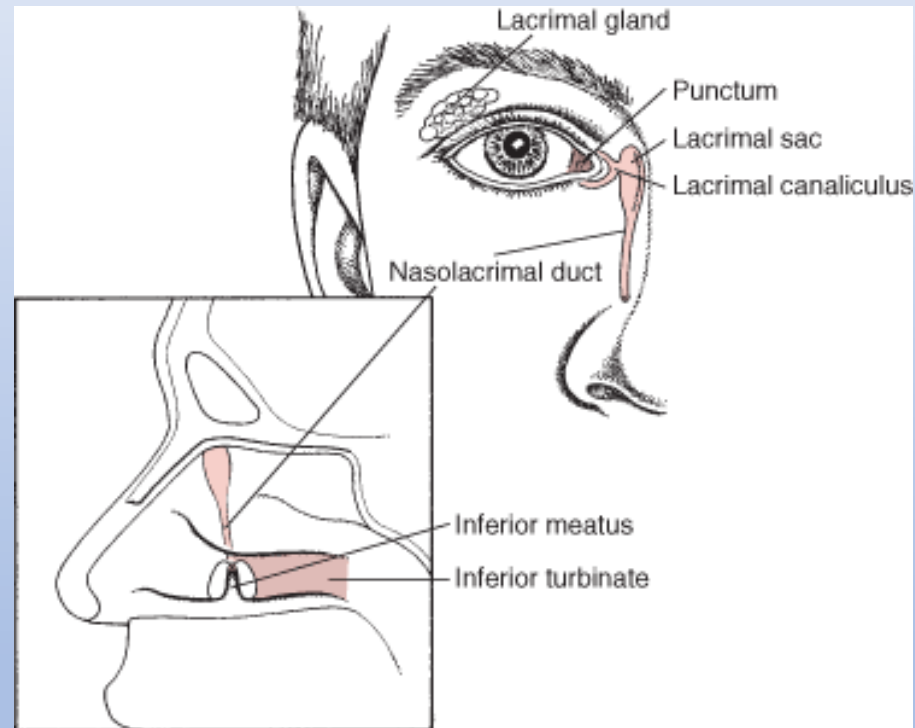
- Spontaneous resolution occurs in most
- Medical treatment may include topical antibiotics, massage
- Surgical treatment (nasolacrimal duct probing)
 - usually wait until after 1 year of age
- Balloon Dacryoplasty



Crigglar's Massage

Steps of Massage

- Trace the inferior orbital rim
- Feel the MCT
- Occlude the inferior canaliculi
- Squeeze towards the second molar



Dacryocystocele



Q&A

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Orange, CA 92868

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Fax: 855-246-2329

Physician available via telehealth and pingmd®

UPCOMING VIRTUAL PEDIATRIC LECTURES

COVID-19 IN CHILDREN

Thursday, October 15, 2020, 12:30 pm – 1:30 pm

GASTROESOPHAGEAL REFLUX

Thursday, October 29, 2020, 12:30 pm – 1:30 pm

FREE REGISTRATION AT

choc.org/VirtualLectureSeries

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(714) 509-4291

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Thank you