Common Pediatric Ocular Diseases and their Treatment
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Congenital Nasolacrimal Duct Obstruction
- Frequent tearing
- Discharge
- Usually unilateral
- Can cause conjunctivitis

Treatment
- Frequent massage
- Antibiotic ointment
- Usually resolves by 6-8 months
- Referral for Probing & Irrigation under light anesthesia

Blepharitis
- Inflammation of the eyelid margin
- Itching, burning, pain
- Redness
- Usually bilateral

3 Main Types
- Seborrheic: yellow, greasy scales, also seborrhea of the brow, scalp, ears
- Staphylococcal: fibrinous scales at the base of the lashes, can be associated with ulcerated lid margins, broken/sparse lashes, and styes
- Mixed: a mix of seborrheic & Staphylococcal

Treatment
- Lid scrubs/ warm compresses
- Antibiotic ointment
- Chronic may need Oral erythromycin 250 mg BID X 10 days
- If corneal involvement, steroid
Case report of Severe Blepharitis

- Reported at age 4 with c/o burning, itching, tearing, frequent blinking, photophobia, difficulty tracking, and discharge from her eyes
- History of: chronic hordeolums since 6 months of age
- Entering Distance VA: 20/200 at 1 foot away with LEA symbols OD, OS, OU
- Retinoscopy: unable to find neutrality due to severely distorted reflex OD, OS

- Slit Lamp Examination: 2+-3+ Blepharitis OU, (2+-3+ scurf and collarettes), 360 degrees of neovascularization throughout cornea with significant corneal scarring and marginal infiltrates OU, chronic hordeolum upper lid OS
- Ophthalmoscopy: No views secondary to severe corneal involvement of BKC
- Referred

- 2 years later returns using Bacitracin ointment BID OU, Pred Forte 1% BID OD, TID OS, and Artificial tears BID OD, TID OS.
- Referred to corneal specialist for consideration of a corneal transplant
- Best Corrected VA with Retinoscopy results: 20/50 OD, 20/60 OS
- Slit Lamp exam: lids and conjunctiva quiet OU, stromal scarring inferior and central OD, stromal scarring superior visual axis OS

- Since the cornea appeared stable, MD changed meds to Bacitracin ung qHs OU, Lotemax qd OU
- Decided she did not need to pursue a corneal transplant at this time
- Referred for RGP’S

Conjunctivitis

- Bacterial
- Bilateral
- Mucopurulent discharge
- Papillae
- Viral
- Bilateral
- Upper respiratory tract infection
- Watery discharge
- Follicles, may be mixed with papillae
Bacterial Treatment
- Bacterial
- Antibiotic
- Cold compress

Viral Treatment
- Viral
- Artificial tears
- Cold compress

Antibiotics approved for infants
- Bleph-10 (Sulfacetamide 10%) 2 mos TID-QID
- Sulamyd (Sulfacetamide 10%) 2 mos
- Isopto Cetamide (Sulfacetamide 15%) 2 mos every 2-3 hrs
- Iloycin (Erythromycin ointment) 2 mos qd or more
- Polytrim (polymyxin B + Trimethoprim) 2 mos max 6 x/day
- Tobramycin/Tobrex 2 mos every 1-4 hrs
- Moxeza (moxifloxacin 0.5%) >4 mos BID/7 days

Antibiotics for Children 1 yr and up
- Fluoroquinolones:
  - Ciloxan gtt (ciprofloxacin) 1 yr every 15 min x 6 hrs, conj every 2 hrs x day
  - Ciloxan ung 2 yr TID x 2 days, BID x 5 days
  - Ocuflox (ofloxacin 0.3%) 1 yr every 2-4 hrs x 2 days, then qd
  - Zymar (gatifloxacin 0.3%) 1 yr qgh x 2 days, then QID
  - Vigamox (gatifloxacin) 1 yr TID
  - Quixin (levofloxacin 0.5%) 1 yr qgh x 2 days, then q4h to QID
  - Iquix (levofloxacin 1.5%) 6 yr
  - Besivance (besifloxacin 0.6%) 1 yr
  - Zymaxid (gatifloxacin 0.5%) 1 yr

Antibiotics for Children 2 year and up
- Aminoglycosides:
  - Garamycin 2 yr QID
  - Genoptic 2 yr QID
  - Gentacin 2 yr QID

- Polymixin B Combination Ointments:
  - Neosporin 2 yr every 2-3 hrs
  - Polysporin 2 yr ung every 3-6 hrs
Other Antibiotics

- AzaSite (Azithromycin 1%) 1 yr 1 gtt BID X 2 days, then qd X 5 days

Allergy

- Bilateral
- Itching
- Tearing
- Photophobia
- Mucous discharge

Treatment

- Artificial Tears, cold compresses
- Anti-Allergy Topicals

Lubricants (all ung)

- Duratears Naturale children
- Hypotears children
- Lacri-lube children

- prefer preservative free
- ung good for nighttime for kids who have difficulty with drops

- Restasis preferred (gel) >16 years

Anti-allergy Topicals

- Alcaine 2 yrs QID up to 4 mos
- Lastacaft 2 yrs QD
- Bepreve 2 yrs BID
- Acular LS 3 yrs QID
- Emadine 3 yrs QD
- Patanol 3 yrs BID
- Pataday 3 yrs QD
- Illostat 3 yrs BID
- Emadine 3 yrs QID
- Alocril 3 yrs BID
- Alamast 3 yrs BID/QID
- Optivar 3 yrs BID
- Crodinom 4 yrs QID to q4h
- Opticrom 4 yrs q4h to q6h
- Alrex 12 yrs QID

Over-the-counter

- Alaway (ketotifen fumarate 0.025%) 3 yr BID
- Refresh (ketotifen fumarate 0.025%) 3 yr BID
- Zaditot (ketotifen fumarate 0.025%) 3 yr BID
- Refresh (ketotifen fumarate 0.025%) 3 yr BID
- Claritin Eye (ketotifen fumarate 0.025%) 3 yr BID
- Naphcon-A 6 yrs QID
- Vasocon-A 6 yrs QID
Vernal Keratoconjunctivitis
- Resolves in 90% by adulthood
- Presents between ages 3-5 years
- Perennial
- Boys >> girls
- History of atopy
- Warm, dry climates

Symptoms/Signs of VKC
- Bilateral
- Itch
- Tearing
- Foreign body sensation
- Photophobia
- Giant papillae
- Horner-trantas dots
- Diffuse punctate epitheliopathy on upper half of cornea

Treatment
- Combination mast cell stabilizer & antihistamines (ie, Patanol)
- Topical steroids if necessary to gain control

Pediatric Steroid Use
- Eflone, FlareX (fluorometholone acetate 0.1%) 2 yrs BID-QID
- Flour-op (fluorometholone alcohol 0.1%) 2 yrs BID-QID
- Maxidex (dexamethasone 0.1%) 2 yrs every 1-2 hrs
- Durezol (difluprednate 0.05%) infant use
Combo drugs:

- Maxitrol (Neomycin 0.35%, Polymyxin B, Dexamethasone 0.1%) 2yrs Ev 3-4 hrs, ung
- Isopto-Cetapred (Sulfacetamide 10%, Prednisolone acetate 0.25%) 2 yrs Ev 1-4 hrs
- Neodecadron (Neomycin 0.35%, Dexamethasone phosphate 0.1%) 2yrs Ev 3-4 hrs
- Poly-Pred (Sulfacetamide 10%, Neomycin, Polymyxin B) 2yrs Ev 3-4 hrs
- Poly-Pred (Prednisolone acetate 0.5%, Neomycin, Polymyxin B) 2yrs Ev 3-4 hrs
- Vasocidin (Prednisolone phosphate 0.1%), Sulfacetamide 10% Ev 1-4 hrs
- Blephamide (Sulfacetamide 10%, Prednisolone 0.2%) 6 yrs Every 1-4 hrs
- Tobradex (Tobramycin 0.3%, Dexamethasone 0.1%) ung 2 yrs

Zylet

Pediatric Use: In a trial to evaluate the safety and efficacy of Zylet in pediatric subjects age zero to six years with lid inflammation, Zylet with warm compresses did not demonstrate efficacy compared to vehicle with warm compresses. Patients received warm compress lid treatment plus Zylet or vehicle for 14 days. The majority of patients in both treatment groups showed reduced lid inflammation. There were no differences in safety assessments between the treatment groups.

Disposable Spray Caps

www.guldenophthalmics.com

Retinoblastoma

- Most common malignant tumor of childhood
- Still rare, 1 in 20,000 live births
- Survival rate over 95%
- Genetic link in 50% of cases
- Mutation in the RB1 gene
- If bilateral, risk other cancers

Presentation

- Child usually under the age of 4
- Leukocoria
- Constant unilateral strabismus
### Differentials

- Myelinated nerve fibers
- Optic nerve coloboma
- Congenital cataracts
- Coats Disease
- Ocular toxocariasis
- Persistent hyperplastic primary vitreous (PHPV)
- ROP

### Myelinated Nerve Fibers

![Image](https://example.com/myelinated_fibers)

### Optic Disk Coloboma

![Image](https://example.com/coloboma)

### Treatment

- Immediate referral to MD
- Enucleation
- Systemic chemotherapy
- Cryotherapy
- Laser coagulation
- Focal Irradiation

- 3 year survival rates ~96%

### Optic Nerve Hypoplasia

- Most common optic disc anomaly
- Subnormal number of optic nerve axons
- Small optic nerve head
- May appear gray or pale
- Yellowish peripapillary halo bordered by a region of decreased or increased pigmentation (Double ring sign)
- Tortuosity of major retinal veins

- Visual acuity range 20/20 – NLP
- Localized visual field defects
- Generalized field constriction possible
- Strong association with astigmatism

- Can be associated with CNS abnormalities
- May have systemic associations
- May be associated with teratogenic agents
Variants of Optic Nerve Hypoplasia

Nystagmus

- Congenital Nystagmus
  - pendular or jerk
  - present at birth, often detected at 2-3 months
  - Horizontal, even in vertical gaze
  - bilateral
  - usually have a null point
  - reduced on convergence
  - head turn or tilt
  - decreased visual acuity

- Congenital Glaucoma
  - First year of life
  - 1 in 10-20,000 in Western countries
  - Higher prevalence in Middle East
  - Highest prevalence in Slovakian gypsies (1 in 1250)
  - Most cases sporadic, not hereditary
  - Low sibling risk

Variants of Optic Nerve Hypoplasia

Nystagmus

- Spasmus Nutans
  - acquired between 4 – 12 months
  - high-frequency, fine, pendular nystagmus
  - dysconjugate oscillations
  - horizontal
  - usually bilateral, can be unilateral
  - head bobbing
  - head tilt
  - resolves spontaneously by 3 years

- nystagmus, especially latent, is often associated with strabismus
- Acquired nystagmus- usually jerk, lesions in vestibular system, brain stem, cerebellum
- Pendular nystagmus secondary to some binocular impairment before 2 years
  - optic nerve hypoplasia, optic atrophy, abnormal macular development, lens opacities, corneal opacities

Treatment

- Refer for MRI
- Correction of refractive error
- Yoked prism to eliminate head turn/tilt
- Contact lens- RGP
- Biofeedback

Congenital Glaucoma
Signs/Symptoms

- Frequent tearing
- Blepharospasm
- Photophobia
- Hazy cornea
- Buphthalmos
- Haab's Striae – ruptures in Descemet’s membrane
- 70 – 80 % Bilateral

Clinical features of primary congenital glaucoma

- Depend on age of onset
- Bilateral in 75% but frequently asymmetrical

- Corneal oedema associated with lacrimation and photophobia
- Buphthalmos if IOP becomes elevated prior to age 3 years
- Breaks in Descemet membrane
- Optic disc cupping

Treatment

- Refer to Pediatric Ophthalmologist, or Pediatric Glaucoma Specialist
- Usually surgery is first line of treatment
- Low vision devices for visual impairment

Retinopathy of Prematurity

- Risk Factors:
  - Low birth weight < 1501 g
  - Immature Gestational age < 32 weeks
  - Oxygen- both hyperoxia and hypoxia may be causative
  - Other factors

5 Stages of ROP

- Stage 1- faint demarcation line
- Stage 2- demarcation line larger and extends further
- Stage 3- Extraretinal neovascularization
- Stage 4- Subtotal retinal detachment
- Stage 5- funnel-shaped total retinal detachment
Treatment

- Cryotherapy
- Laser
- Retinal detachment surgery

Optometric Management

- Correct refractive error—expect high myopia
- Strabismic management—incidence raises from 6% to 30%
- DFE—RD can occur later in life
- Low vision devices

Congenital Cataracts

- Present at birth, but often found later in the first year
- Decreased vision
- Light sensitivity
- Leukocoria
- Nystagmus (if bilateral)
- Strabismus

Causes

- 50% idiopathic
- Autosomal dominant inherited
- Intrauterine infections
- Ocular anomalies (ie. Aniridia, microphthalmia, PHPV, coloboma)
- Metabolic disorders
- Systemic syndromes
Infant, Mother, Grandmother

**Treatment**
- Refer for surgical consult
- Refer to pediatrician
- Density is more critical than size of opacity
- Dense bilateral cataracts- remove by 8 weeks
- Visual prognosis can be better in bilateral than unilateral
  - Early Intraocular lenses?

Optometric Management
- Contact lenses
- Spectacles
- Amblyopia Management

Myopic Management

12 month old
- HX: “vision seems ok, child is shy, seems to get very close to the TV”
- Family Ocular HX: May have significant refractive error in the family
- Health HX: ROP, Down’s Syndrome, Albinism

Exam results
- Teller Acuity Cards- inconsistent results OD, OS
- + Horizontal OKN response
- Briefly fixate and follow OD, OS
- NO significant difference in behavior when patching either eye
- Hirschberg/kappa: central – no strabismus
- EOM: Full to penlight
- Auto K’s: 43.00/43.25 @ 180 OD
  - 43.25/43.50 @ 180 OS
Retinoscopy
- OD: -3.00 Dsph
- OS: -3.75 Dsph
- Re-evaluate eye posture: still orthophoric
- Wet Ret: No change

Management
- No SRx at this time
- Monitor closely, every 3 months
- Once the refractive error appears stable after 2-3 more visits give SRx
- Final SRx: -3.00 Dsph OD
- -3.75 Dsph OS

Partial SRx given
- OD: -4.00 Dsph
- OS: -4.00 Dsph
- Monitor in 4 – 6 weeks, then every 3 months
- Evaluate VA, posture, refractive error & lifestyle changes
- If stable after 1-2 more visits increase the myopia
- Consider a bifocal in the future esp. if esophoric posture continues

CLs?
- No need to consider CL's
- May consider, especially if difficulty keeping SRx on
- May consider if concern over amblyopia developing
- Parents must be VERY motivated

6 year old
- HX: failed the school screening, first eye exam, no visual complaints
- No birth, health, or family issues
- VA (Snellen): FC at 5 feet OD, 20/50 OS
- Poor fixation on most entrance tests with OD, but nothing remarkable

Retinoscopy
- -8.00 Dsph OD
- -2.00 Dsph OS
- Same with cycloplege
- Best VA: 20/80 OD, 20/20 OS

Management
- Full-time SRx and CL
- CL OD: -5.50
- SRx OD: -2.00, OS: -2.00
- POLYCARBONATE!!!! For full-time wear and sports goggles!
- Amblyopia management: patching/atropine
3 year old

- HX: “looks like eye isn’t straight, not sure which one”
- Stereo: (-) Forms, (+) Lang I 550 sec
- VA (broken wheel): 20/60 OD, OS, poor fixation and attention
- DCT & NCT: 12 pd intermittent alternating exotropia
- NPC 12/16 cm

Management Options

- Vision Therapy- Parent/patient unable to do VT at this time due to age, cost, convenience
- Minus Overcorrection- Final SRx given -3.00 Dsph OU
- Prism- for possible use in the future
- Re-eval in 4-6 weeks

Retinoscopy (dry & wet): -1.00 Dsph OD, OS

Trial frame and re-measure CT: 10 pd intermittent exotropia

Prism Bar Ranges: Near BO X/15/10, Near BI X/12/10

Thank you!!

- Any questions?
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