

Help!

How do I examine a 5 year old?

Pearls, Techniques and Management

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Disclaimer and Disclosure

I have no conflicts of interest or financial interests related to products or concepts discussed in this presentation to disclose.

Outline

- Important Patient History Elements
- Exam Techniques for the Young Child
 - Normative Data for Exam Elements
- What places a child's at risk?
- What are indications there may be a Learning Related Visual Dysfunction?
- Age Guidelines and Dosing for Ophthalmic Medications

Important Patient History Elements

What brings you in today?

- Chief Complaint
- Date of the child's last eye examination
 - Results of that examination
 - Performed by OD/MD/Pediatrician
 - Glasses prescribed??

Patient Medical History

- Birth History
 - Birth weight/APGAR
 - Premature birth
 - Were they under oxygen?
 - Any complications of the birth mother during pregnancy? How was prenatal care?
 - Any complications with the delivery?
 - Did the mother deliver via C-section?
 - How has perinatal care been?

Apgar Score

APGAR SCORE for assessing newborns			
CRITERIA	0	1	2
Color	Pale or blue	Pink body, blue extremities	Pink body and extremities
Heart Rate	Absent	Less than 100 beats per minute	Greater than 100 beats per minute
Respiration	Absent	Slow and irregular	Good breathing with crying
Reflex Response	Absent	Grimace or noticeable facial movement	Coughs, sneezes or pulls away
Muscle Tone	Absent	Some flexion of extremities.	Active and spontaneous movement of limbs

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Patient Medical History

- Developmental History
 - At what age did your child sit up without support?
 - At what age did your child crawl?
 - Did your child crawl on their hands and knees?
 - At what age did your child walk?
 - At what age did your child say their first words?
 - Were there any concerns regarding the growth and development of your child?

Gross motor development is directly related to visual skills development!

Gross motor development is occurring at the same time as visual development in the first 12 months of life.

Gaps in gross motor skills lead to gaps with visual skills (CI, CE, AI, AE, Strabismus etc.). Just the same, visual inefficiency, especially amblyopia and strabismus, and sight limiting conditions lead to gaps in motor development.

Predictors of Motor, Visual and/or Developmental Delays

- During pregnancy:
 - Viral infection
 - Alcohol/Drug abuse
 - Accident or infection
 - Hypertension
 - Smoking
 - Severe Stress
- At Birth:
 - Prolonged Labor
 - Forceps extraction
 - Cesarean
 - Fetal distress
 - Prematurity
- As a newborn:
 - Low weight
 - Incubation
 - Problems with Feeding
- Infancy
 - Absence of crawling
 - Late learning to walk
 - Late learning to talk
- Childhood:
 - Motion sickness
 - Difficulty learning to ride a bike
 - Difficulty learning to read or write
 - Difficulty learning to tell time
 - Poor eye-hand coordination

Why are motor milestones missed?

- Relying heavily on modern baby equipment (bucket seats, bouncers, walkers)
- Infants sleeping on their back campaign (for improved safety this is important)
- Less tummy time
- Modern medicine allows more premature babies to survive (they go through different sensory experiences)
- Lack of motor experience of children who live in orphanages
 - Most of their time may be spent in a crib, little time playing
- “Quality time” does not make up for “Quantity time” that needs to be spent in physical and social interaction in the early years

Patient Medical History

- Systemic Health History:
 - Childhood diseases
 - Periods of time with the flu
 - Periods of very high temperatures
 - Injuries/Bad falls
 - Any medications being taken? Any allergies?
 - Any known neurologic conditions?
 - Seizures
 - Syndromes
 - Autism Spectrum disorder

History of Previous/Current Therapies

- Has your child ever been evaluated by an...
 - Occupational therapist (OT)
 - Physical therapist (PT)
 - Speech-language pathologist (SLP)
 - Audiologist
- What were the results?
- Did the child receive, or is the child currently receiving therapy?

Patient Medical History

- Family History
 - Diabetes, hypertension, cancer
 - Glaucoma
 - Strabismus?
 - Amblyopia?
 - Binocular Dysfunctions?
 - Learning Disability?

Academic/Educational History

- What grade is the child in?
- Have they ever had an educational evaluation?
- Are they currently on an IEP(Individualized Education Plan)?
- Do they have a 504 plan in place at school?
- Are they in Special Education for any subjects?
- Have they received tutoring or remediation in any subjects? In what grade?
- Do they demonstrate any behavior challenges in school or otherwise?


COVID-Quality of Life Checklist

(Optometry, vol 73, No 8, Aug 2002)

If the patient's total scaled score exceeds 20, a binocular dysfunction is suspected...

	NEVER	ONCE IN A WHILE	SOMETIMES	A LOT	ALWAYS
1. Headaches with near work					
2. Words run together					
3. Burning, itchy, watery eyes					
4. Skips/repeats lines					
5. Head tilts/closes an eye when reading					
6. Difficulty copying from chalkboard					
7. Avoids near work/reading					
8. Omits small words when reading					
9. Writes up/down hill					
10. Misaligns digits/column of numbers					
11. Reading comprehension down					
12. Holds reading material too close					
13. Trouble keeping attention on reading					
14. Difficulty completing assignments on time					
15. Always says "I can't" before trying					
16. Clarity, focus change over					
17. Does not use hither side well					
18. Loses belongings/things					
19. Forget/poor memory					
Score	00	11	22	33	44

Convergence Insufficiency Symptom Survey(CISS)




- For Children, a score >16 is suggestive of convergence insufficiency
- For Adults, a score >21 is suggestive of convergence insufficiency
- Optometry and Vision Science 2003; 80(12):832-838

Exam Techniques for the Young Child

Exam Elements
Normative Data


Exam Elements in the Visual Evaluation of the Young Patient

- Visual Acuity at Distance and Near
- Ocular Motilities
- Color Vision
- Confrontation Fields
- Cover Test at Distance and Near
- Near Point of Convergence (NPC)
- Stereopsis
- Hirschberg / Bruckner
- Pupils
- Retinoscopy/Refraction
- Phorias/Vergences
- Accommodative Assessment
- Ocular Health Evaluation



Visual Acuity


- Ocluder may not always work
- Patch with adhesive patch, fun occlusion glasses, or a pirate type patch
- Have the parent help to cover an eye
- If you suspect amblyopia, check vision in that eye FIRST



Goodlite.com

Visual Acuity: Distance

- Snellen Letters
- Forced choice preferential looking-resolution acuity
 - Teller acuity cards
 - LEA paddles



Back

Front

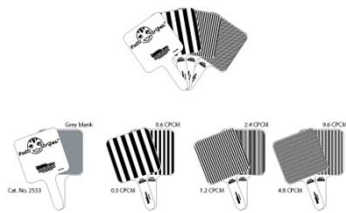
Visual Acuity: Distance

- Forced Choice Preferential Looking-resolution acuity
 - Cardiff Cards
 - Held at 50 or 100 cm
 - Each card is displayed four times to patient



Visual Acuity: Distance

- Forced Choice Preferential looking-resolution acuity
 - Patti Stripes Square Wave Grating



Visual Acuity: Distance

- Forced Choice Preferential looking-resolution acuity
 - Richman face dots test paddles
 - Uses contrast sensitivity



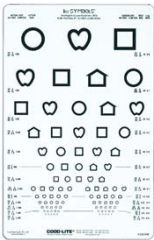
Visual Acuity: Distance

- Lea Symbols
 - Recognition acuity
 - Can be done at near and at distance
 - Matching
- Broken Wheel test
 - Distance only – 10 ft
 - Landolt C



Visual Acuity: Near

- LEA symbols (shapes)
- Allen optotypes- only goes to 20/30
- HOTV



Normative Data: Acuity

Should have **equal** resistance to occlusion

Forced Choice Preferential Looking

1 month- 20/800

6 months- 20/100

1 year- 20/50

3 years – 20/20



LEA, HOTV, Snellen

3yrs old – 20/40 - 20/20

5 yrs old – 20/20

Entrance Tests: Pursuits and Saccades

- H pattern EOM's
- NSUCO/SCCO
 - Norms start at 5 years old
- Use an interesting target
 - Large, lighted toy
 - Target that makes noise
 - Fan
 - iPhone

NSUCO Pursuits

Measure	Score	Criteria
Ability	1	Cannot complete 1/2 rotation in clockwise or counterclockwise rotation
	2	Completes 1/2 rotation in either direction
	3	Completes one rotation in either direction but not two
	4	Completes two rotations in one direction less than two in the other
	5	Completes two rotations in both directions
Accuracy	1	No attempt to follow the target or requires more than 10 fixations
	2	Re-fixations 5 to 10 times
	3	Re-fixations 3 to 4 times
	4	Re-fixations two times or less
	5	No re-fixations
Head/Body Movement	1	Large movement of head or body at any time
	2	Moderate movement of head or body at any time
	3	Slight movement of head/body more than 50% of time
	4	Slight movement of the head/body less than 50% of time
	5	No movement of the head or body

NSUCO Saccades

Measure	Score	Criteria
Ability	1	Completes less than 2 roundtrips
	2	Completes two round trips
	3	Completes three round trips
	4	Completes four round trips
	5	Completes five round trips
Accuracy	1	Large over/undershooting is noted one or more times
	2	Moderate over/undershooting is noted one or more times
	3	Constant/slight over/undershooting noted more than 50% of time
	4	Intermittent/slight over/undershooting noted less than 50% of time
	5	No over/undershooting noted
Head/Body Movement	1	Large movement of head or body at any time
	2	Moderate movement of head or body at any time
	3	Slight movement of head/body more than 50% of time
	4	Slight movement of the head/body less than 50% of time
	5	No movement of the head or body

Pursuits and Saccades: Take Note

- Accuracy and ability to locate the target with their eyes
- Head or Body movement
- Sound needed to locate the target
- Movement or flashing of the light needed to locate the target

Normative Data: Pursuits

FOR FIVE YEARS OF AGE:
Should be able to complete rotations
Girls all 4 rotations cw and ccw
Boys 2 rotations (either cw or ccw)
Several re-fixations
Boys 5- 10 times
Girls 3-4 times
Head movement
Moderate for boys
Slight for girls
Body movement
Slight for girls < 50 %
Slight for boys > 50 %

Normative Data: Saccades

FOR FIVE YEARS OF AGE:
Should be able to do 5 round trips
Constant slight over/under shoot
Moderate head movement
Slight body movement (> 50% for boys) (< 50% for girls)

Normative Data: Oculomotor Skills

By 5-6 years of age, the eyes should be able to move independently of the head
By 7 years of age, pursuits and saccades should perform at adult levels, smooth and accurate

Entrance Testing: Color Vision

- Ishihara
- Hardy-Rand-Ritter(HRR)
- Color Vision Testing Made Easy



Entrance Tests: Visual Field

- Attempt Confrontation Fields with finger counting
- Confrontation procedure with toys/targets
 - Full to Toys
 - Can be done OU

Entrance Tests: Binocularity

- Near Point of Convergence
 - Interesting target
- Cover test
 - Use thumb as occluder for young or small patients
 - Rest hand on their head
 - Fixation target with sound at distance
 - Fixation target at near with illumination or sound



Normative Data: NPC and Cover Test

NPC-expected by 3-6 months of age (2-3 inches)
Norm is 5/7cm
Cover Test - Alignment by 6 months of age
Norm is 1 esophoria to 3 exophoria at distance
Norm is orthophoria to 6 exophoria at near
Should have **equal** resistance to occlusion

Entrance Tests: Binocularity

- Bruckner
 - Looking for equal reflexes <http://drispangler.com>
 - Strabismic/Amblyopic eye is brighter
 - *Gross assessment of refractive error*



- Hirschberg /if needed Krimsky
 - 1mm= 22pd
 - Normal is slightly nasal



Entrance Tests: Binocularity

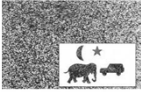

- Assessment of Stereopsis
 - Stereo Smile Test
 - Preferential choice looking – Random Dot
 - At 55 cm
 - Need to have VA at least 20/80
 - Three levels
 - Training
 - 480 sec arc*
 - 120 sec arc



www.richmondproducts.com

Entrance Tests: Binocularity



- Optional
 - Lang II
 - No glasses needed
 - Keystone basic binocular test

**Does the child grab at the 3D target?

Entrance Tests: Binocularity

- Other options
 - Stereo Fly
 - Random Dot Butterfly

*For Contour Circles, have the child "ring the doorbell"

Stereoptical.com

Normative Data: Stereopsis

Stereopsis emerges at 3-4 months of age (even random dot)
 Well developed by 6 months
 Normal test result on Stereo Smile
 2 yrs old – 480 sec arc


Operant preferential looking stereoacuity age norms

Age (months)	Stereoacuity (sec of arc)
18-23	250
24-29	225
30-35	125
36-53	100
54-65	60

Ciner, et al. Optom Vis Sc
 1991;68 (7): 533-536

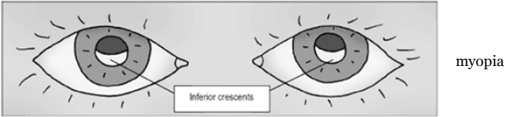
Entrance Tests: Binocularity

- Worth 4 Dot or Three Figure Flashlight
 - Assess presence of flat fusion
 - Is diplopia or suppression present?
 - Have them count the dots!




Refractive Error

- Using Bruckner reflex to assess refractive error
- Only with very high refractive errors
 - Inferior crescents- Myopia
 - Superior crescents- Hyperopia



Refractive Error

- Distance Retinoscopy
- Mohindra Retinoscopy
 - Estimation of distance refractive error
 - Dark room with only light source being the retinoscope
 - 50cm working distance
 - Patient fixates on your retinoscope/light
 - Use lens rack or loose lenses to estimate prescription
 - **Modification correction factor**
 - -1.25 if older than 2 years old
 - -0.75 if younger than 2 years old
 - **DO NOT take into account your working distance, use correction factor only...**



Refractive Error

- Cycloplegic Retinoscopy
 - 2 gtt Cyclopentolate OU 5 mins apart
 - Birth to 1 year- 0.5% Cyclopentolate
 - > 1 year old – 1% Cyclopentolate
 - Cyclopentolate 1% and Tropicamide 1%

Caution with patients with:

- Down's syndrome
- Cerebral palsy
- Trisomy 13 and 18
- Other CNS disorders



Normative Data: Refractive Error @ Age 5

Emmetropization continues

Low hyperopia expected (+1.00D +/- 0.85D)

Prediction

If you see myopia, it will likely progress

If you see hyperopia > +1.25 at age 6, they will remain hyperopic

If you see astigmatism > - 2.50 at 1 yr of age, it will likely remain

SO CONSIDER PRESCRIBING!!!!!!!

Binocularity Testing outside phoropter

• Phoria

- Modified Thorington card
- Muscle Imbalance Measurement Cards
 - For distance and near



• Vergences

- With prism bar and interesting target
- Does subjective response match objective finding?



Normative Data: Phorias and Step Vergences

Phorias

- Norm is 1 esophoria to 3 exophoria at distance
- Norm is orthophoria to 6 exophoria at near

Step Vergences (prism bar outside phoropter)

- BO at Distance: x/11/7
- BI at Distance: x/7/4
- BO at Near: x/23/16
- BI at Near: x/12/7

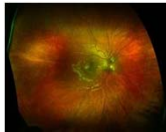
Accommodative Amplitude/Response

- Accommodative amplitude
 - Donders pull-out (rather than push-up) method
 - Minimum is $15 - 1/4 \text{ age}$
- MEM or other near retinoscopy
 - Accommodative lag/lead
 - Norm is $+0.75$ by 4 months of age



Ocular Health Testing


- ▶ Pupils
- ▶ IOP
 - Finger Tension
 - Tonopen
 - Handheld (Icare)/Standard NCT
- ▶ Anterior Segment
 - Penlight/BIO with 20 D lens
 - Standard/Handheld Slit lamp
- ▶ Posterior Segment: Dilated Fundus Evaluation
 - Standard/Handheld Slit lamp
 - BIO
 - Panoptic
 - Monocular indirect ophthalmoscope (MIO)
 - OPTOS




Ocular Health- Testing

- What drops to use?
 - Tropicamide 0.5% to 1%
 - Some sources say 1% only in > 1 yr old
 - Minimally effective for cycloplegia but can be used for this purpose if concerns about hypersensitivity (ie Down's or CNS issue)
 - After 3 yrs can use Phenylephrine 2.5 % with Tropicamide
 - If no contraindications
 - Birth to 1 year- 0.5% Cyclopentolate
 - > 1 year old – 1% Cyclopentolate
 - **NO Phenylephrine in children < 3 years old**
 - Potential cardio side effects
 - **Not in children with h/o cardiovascular problems**

Ocular Health- Testing



- Should I use propracane?
 - If you think you are only going to get 1 chance to get a drop in... no!
- Spray form of drops may come in handy
- If you cannot view the retina and feel there maybe an issue
 - Refer for DFE under anesthesia
- Special care- possible increase reaction to drops, especially cyclopentolate!
 - Down's syndrome
 - Cerebral palsy
 - Trisomy 13 and 18
 - Other CNS disorders




What should I be looking for?

- Lid abnormalities
 - Lid Coloboma
 - Entropion/Ectropion
 - Epicanthus
 - Ptosis
 - Hemangioma
 - Port-wine stain
- Nasolacrimal duct obstruction
- Cornea and Conjunctiva
 - Dermoid Cysts
 - Megalocornea
 - Microcornea
 - Corneal opacities
- Iris Abnormalities
 - Aniridia
 - Iris Coloboma
 - Effects of Albinism
- Glaucoma
- Lens abnormalities
 - Ectopia Lentis
 - Congenital/Acquired Cataracts
- Retinal findings
 - Retinopathy of Prematurity
 - Chorioretinitis
 - Histoplasmosis
 - Toxocara
 - Choroidal Coloboma
 - PHPV
 - Retinitis Pigmentosa
 - Sickle Cell
 - And Many Others!!!

What places a child at risk?

Norms for Refractive Error
Amblyogenic Factors



Refractive Error: Know the Trend

<ul style="list-style-type: none"> • Infants <ul style="list-style-type: none"> ◦ Avg +2.00D hyperopia(+/-2) ◦ ATR astigmatism(up to 2D) <ul style="list-style-type: none"> • Especially in Caucasians ◦ Anisometropia • Toddler (1-5yrs) <ul style="list-style-type: none"> ◦ Low Hyperopia ◦ WTR astigmatism <ul style="list-style-type: none"> • Switches at age 3 1/2 ◦ Low prevalence of anisometropia 	<p>CONCERN:</p> <p>Myopia > 5.00D(any age) Myopia >3.00D(>1yr) Myopia >1.00D(3yrs)</p> <p>Hyperopia >2.00D</p> <p>Astigmatism >1.25D</p> <p>Aniso >1.00D</p>
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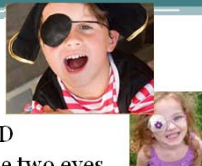
General Guidelines for Prescribing

<ul style="list-style-type: none"> • If over 3 years old, may want to consider correcting any amount of myopia • Over one year of age, may want to consider correcting 3-5D of myopia 	<ul style="list-style-type: none"> • Correct over 2.50D of hyperopia • Monitor astigmatism closely <ul style="list-style-type: none"> ◦ Should be prescribed by 2 years if it is over 1.25D and has been stable for 3-6 months
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Signs/Symptoms Uncorrected Refractive Error in older children

- ▶ Difficulty with depth perception
- ▶ Difficulty with eye/hand coordination
- ▶ Confuses likeness with minor differences
- ▶ Frequently rubbing eyes
- ▶ Blinks excessively
- ▶ Complains of double vision
- ▶ Cannot maintain fixation on a task
- ▶ Closes or covers an eye
- ▶ Lack of interest in outdoor activities
- ▶ Positions self close to TV or books
- ▶ Squints
- ▶ Lack on interest in near tasks
- ▶ Displays no signs or symptoms

Amblyogenic factors



- ▶ High uncorrected myopia
- ▶ Uncorrected hyperopia > 2.00D
- ▶ Unequal hyperopia between the two eyes
- ▶ As little as 1.25D of uncorrected astigmatism
- ▶ As little as 1.00D of anisometropia
 - Significant correlation between anisometropia and hyperopic refractive error greater than 2D leading to amblyopia
 - Higher risk when astigmatism is >1.50D, hyperopic anisometropia is >1.00D or myopic anisometropia is >3.00D.

Therapeutic Sequence for Strabismic Amblyopia

- Prescribe an appropriate prescription based on previous guidelines.
- Implement occlusion therapy for strabismic amblyopia. Patching is necessary for constant unilateral strabismic amblyopia.
- Prescribe an active vision therapy program to augment occlusion therapy.
- Assess prescription power and visual acuity with appropriate frequency, every 1-2 months.
- Consider strabismus surgery when the visual function of the amblyopic eye has attained max improvement through nonsurgical means.
- Monitor compliance with prescription and maintenance activities.

Occlusion Schedule:
Unilateral Strabismic Amblyopia

- 1 year old • 4, 60 minute periods per day
- 2 year old • 3, 30 minute periods per day
- 3 year old • 3, 30 minute periods per day
- 4 year old • 2, 60 minute periods per day
- 5 years and up • 2, 60 minute periods per day

Occlusion Schedule:

- What if it is bilateral amblyopia or alternating strabismus?
 - Split the time between the two eyes.
- What if the amblyopia is unequal?
 - Patch each eye, consider spending more time patching the better seeing eye.
- What if they are not improving?
 - Are they cheating? Use different type of patch (pirate, bangerter, removable tape if has rx, adhesive patch)
 - Getting from 20/30 to 20/20 is hardest piece, may take longer than it did to get from 20/200 to 20/60...
 - Do they have a microtropia?

Indications there may be a Learning Related Visual Dysfunction.

What did your Case History tell you?

Kids with learning related vision dysfunctions may report eyestrain, headaches, and blurred or double vision. Parents may report poor academic and sports performance. Teachers often report they suspect a child may have difficulty with attention. They often have trouble with reading comprehension and poor attention

Are your findings within normal range? Morgan's Table of Expecteds

- Distance Lateral Phoria ▪ 1 exo +/- 2
- Near Lateral Phoria ▪ 3 exo +/- 3
- BO at distance ▪ 9/19/10
- BI at distance ▪ -7/4
- BO at near ▪ 17/21/11
- BI at near ▪ 13/21/13
- Amplitudes ▪ 18-1/3age
 Min=15-1/4age
- Fused Cross Cylinder ▪ +0.50 +/-0.50
- NRA ▪ +2.00 +/-0.50 (+2.50)
- PRA ▪ -2.37 +/-1.00 (-3.00)

***Visual Skills should be at adult levels by 7 years of age

COVD-Quality of Life Checklist (Optometry, vol 73, No 8, Aug 2002)

If the patient's total scaled score exceeds 20, a binocular dysfunction is suspected...

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15. Always says "I can't" before trying					
16. Usually, looks things over					
17. Doesn't use top/bottom line well					
18. Loses his/her place/line					
19. Forgetful/poor memory					
Score	00	01	02	03	04

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Age Guidelines and Dosing for Ophthalmic Medications

Antibiotic - Ointment

- **Erythromycin 0.5% (Ilotycin)**
 - For use in neonates and older
 - Dosing: up to 6 times per day for 7-10 days
- **Tobramycin 0.3% (Tobrex)**
 - Approved age 2 months and older
 - Dosing: 1-2gtts q3-4 hours (can start q1h until improving)
- **Gentamicin**
 - Approved in >1 month old, Dosing: bid to tid
 - Toxic, safety in neonates not established
- **Ciprofloxacin (Ciloxan)**
 - Approved age 1 year and older
 - tid x 2 days, then bid x 5 days

Antibiotic - Drops

- Polymixin B/Trimethoprim (Polytrim)
 - Approved Age 2 months and older
 - Dosing: q 3 hours for 7-10 days (max 6 doses/day)
- Tobramycin 0.3% (Tobrex)
 - Approved Age 2 months and older
 - Dosing: can use q1h until improvement, then 1-2gtts q4h
- Gentamicin
 - Approved >1 month old. Dosing: 1gtt q4h
 - Toxic, safety in neonates has not been established
- Azithromycin (Azasite)
 - Approved Age 1 year and older
 - Bid x 2 days(8-12hrs apart) then qd x 5 days
- DO NOT USE Sulfacetamide
 - Approved in >2 months old
 - Risk for Stevens Johnson

Antibiotic - Drops (fluroquinolones)

- Ciprofloxacin(Ciloxan)*, **
- Ofloxacin 0.3% (Ocuflax)*, **
- Levofloxacin 0.5% (Quixan)*, **
- Gatifloxacin 0.3% (Zymar)
- Gatifloxacin 0.5% (Zymaxid)*, **
- Moxifloxacin 0.5% (Vigamox)*
 - Tid x 7 days
- Moxifloxacin 0.5% (Moxeza)
 - Approved for age 4 months and older
 - Bid x 7 days
- Besifloxacin 0.6% (Besivance)*
 - Tid x 7 days
- *Approved age 1 year and older
- **1-2 gtts q2h while awake x 2 days, then q4h x 5 days

Anti-Allergy Agents

- Lodoxamide (Alomide)
 - Approved for age 2 years and older
 - 1-2 drops qid, max is 3 months duration
- Epinastine (Elestat)
 - Approved for age 3 years and older
 - 1gtt bid
- Pemirolast (Alamast)
 - Approved for age 3 and older
 - 1gtt q4h, for treatment up to 4 weeks
- Emadastine (Emadine)
 - Approved for age 3 and older
 - 1gtt qid
- Olopatadine (Pataday)
 - Approved for age 3 years and older
 - 1 gtt qd
- Ketotifen (Zaditor)
 - Approved for age 3 years and older
 - 1 gtt q8-12h, max is 2gtts/eye/24hrs
- Pheniramine/naphazoline (Naphcon-A)
 - Approved for age 6 and older
 - 1gtt prn, max use is 4 times per day

Antifungal Drops

- Natamycin 5% ophthalmic
 - Safety in pediatric patients not established

Topical NSAIDS

- Nepafenac 0.1% (Nevanac)
 - Approved age 10 years and older
 - Dosing: 1gtt tid x 15 days
- Ketorolac 0.4% (Acular, Acular LS)
 - Approved age 3 years and older
 - Dosing: 1gtt qid
- Ketorolac 0.45% (Acuvail)
 - Safety in pediatric patients not established
- Diclofenac 0.1% (Voltaren)
 - Safety in pediatric patients not established

Steroid/Antibiotic Combinations

- Dexamethasone 0.1% and Tobramycin 0.3% (Tobradex) gtts and ung
 - Approved age 2 years and older
 - Dosing: 1-2gtts q4-6h
- Dexamethasone, Neomycin and Polymixin B (Maxitrol) gtts and ung
 - Safety in pediatric patients not established
- Loteprednol 0.5% and Tobramycin 0.3% (Zylet)
 - Safety in pediatric patients not established

Steroid Drops

- Loteprednol etabonate 0.2% (Alrex)
 - Safety in pediatric patients not established
- Loteprednol etabonate 0.5% (Lotemax)
 - Safety in pediatric patients not established
- Fluoromethalone 0.1% (FML)
 - Approved age 2 years and older
 - Dosing: bid to qid
- Fluoromethalone 0.25% (FML Forte)
 - Approved age 2 years and older
 - Dosing: bid to qid
- Prednisolone Acetate 1% (Pred Forte)
 - Safety in pediatric patients not established
- Difluprednate (Durezol)
 - Safety in pediatric patients not established

Topical Antiviral Drops

- Trifluorothymidine (Viroptic)
 - Approved for age 6 years and older
 - Dosing: q2h, up to 9 times per day
- Ganciclovir (Zirgan)
 - Approved for age 2 years and older
 - Dosing: 5 times per day until healed, then tid x 7 days

Glaucoma

- Brimonidine 0.2% (Alphagan/P)
 - Approved in age 2 and older
 - Dosing: 1gtt tid
- Timolol 0.2%, 0.5% (Timoptic, Istalol)
 - Safety not established in pediatric population
- Brimatoprost 0.01%, 0.03% (Lumigan)
 - Approved in age 16 and older
 - Dosing: 1gtt qhs
- Travoprost 0.004% (Travatan/Z)
 - Safety not established in pediatric population
- Latanoprost 0.005% (Xalatan)
 - Safety not established in pediatric population
- Brinzolamide 1% (Azopt)
 - Safety not established in pediatric population
- Dorzolamide 2% (Trusopt)
 - ? Caution advised, Dosing: 1 gtt tid

In Summary:

- Patient history is an important predictor as to what you will find during your exam
- You can acquire information about each of your exam elements, just using different tools
- Know the trends for refractive error, and what implies amblyogenic risk, so that you know when to prescribe
- Know what clues may indicate a learning related visual dysfunction
- Be equipped with age and dosing guidelines for young children

THANK YOU!

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