

# *Prescribing for a Preverbal Population*

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# Prescribing for Preverbal Children

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## **Issues to consider:**

- Age
  - Visual Function
  - Refractive Error Norms
  - Amblyogenic Risk Factors
  - Birth History
  - Family History
  - Developmental History
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# Emmetropization

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- *A process presumed to be operative in producing a greater frequency of occurrence of emmetropia than would be expected in terms of chance distribution, as may be explained by postulating that a mechanism coordinates the formation and the development of the various components of the human eye which contribute to the total refractive power*
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# Refractive Error Norms

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- *Highest rate of emmetropization – 1<sup>st</sup> 12-17 months*

## *Hyperopia*

- *Average refractive error in infants = +2 D*
  - *> 1.50 diopters hyperopia at 5 years old – often remain hyperopic*
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# Refractive Error Norms

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## *Myopia*

***25% of infants are myopic***

Myopic Newborns (Scharf)

@ 7 years 54% still myopic

@ 7 years 46% emmetropic

@ 7 years no hyperopia

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# Refractive Error Norms

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## *Astigmatism*

- Against the rule astigmatism more prevalent switches to with-the-rule with development
  - At 3 1/2 years old astigmatism is at adult levels
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# Potentially Amblyogenic Refractive Errors

<b>Isometropic Amblyopia</b>	<b>Diopters</b>
Astigmatism	> 2.50
Hyperopia	> +5.00
Myopia	> -8.00

<b>Anisometropic Amblyopia</b>	<b>Diopters</b>
Astigmatism	> 1.50
Hyperopia	> +1.50
Myopia	> -3.00

# *Pediatric Trial Frame Use*

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# **Cycloplegic Refraction**

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# ***INDICATIONS OF A CYCLOPLEGIC EXAM***

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- ESOTROPIA**
  - New patient under 5 years of age**
  - Moderate to high hyperopia**
  - Suspected latent hyperopia**
  - Uncooperative/non-communicative patients**
  
  - Suspected pseudomyopia
  - Suspected malingering
  - Acuity not corrected to predicted level
  - Variable / inconsistent responses during manifest refraction
  - Symptoms seem unrelated to degree of RE
-

# ***MYOPIA***



# Question # 1

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- What is the threshold amount of myopia for which you would prescribe eyeglasses in a **1 year old**?***
- a) -1.00 to -1.75 D
  - b) -2.00 to - 2.75 D
  - c) -3.00 to -3.75 D
  - d) -4.00 D or higher
-

# Question # 1

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- What is the threshold amount of myopia for which you would prescribe eyeglasses in a **1 year old**?***
- a) -1.00 to -1.75 D
  - b) -2.00 to - 2.75 D
  - c) -3.00 to -3.75 D
  - d) -4.00 D or higher**
-

# ***Case Example***

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# Case Example

## 3 month old twins

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Case findings	
Case History	8 week premature Birth weight = 2 lbs, 4 oz 3 lbs, 2 oz
Visual Acuity	F & F OD, OS
EOMs	FROM OD, OS
Kappa / Hirshberg	Ortho
Cycloplegic Retinoscopy	- 6.50 -1.00 x 180 OD, OS
Ocular Health Evaluation	Normal

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## ***Myopia – Case Example***

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3 months -6.50 D



6 months -3.00 D



9 months -0.50

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# ***Myopia and Prematurity***

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- Prematurity = strong predictor of myopia
    - Greater than then low birth weight
  
  - ***Retinopathy of Prematurity***
    - strong predictor for myopia ( $> \text{BW} = \downarrow \text{myopia}$ )
    - Presence of myopia increases sharply as Stage 3 ROP is reached
  
    - Etiology
      - $\uparrow$  axial length
      - $\uparrow$  lenticular power
      - $\uparrow$  corneal curvature
- 
- Arrested development of anterior segment

# Question # 2

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■ ***What is the threshold amount of myopia for which you would prescribe eyeglasses in a 2-3 year old?***

- a) -1.00 to -1.75 D
  - b) -2.00 to -2.75 D
  - c) -3.00 to -3.75 D
  - d) -4.00 D or higher
-

# Question # 2

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■ ***What is the threshold amount of myopia for which you would prescribe eyeglasses in a 2-3 year old?***

- a) -1.00 to -1.75 D
  - b) -2.00 to -2.75 D**
  - c) -3.00 to -3.75 D
  - d) -4.00 D or higher
-

# ***Case Example***

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# Case Example

## 2 year old Hispanic Female

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Case findings	
Case History	FT birth / (-) developmental delay c/o getting close to TV and books
Visual Acuity	<i>UTT (poor cooperation noted)</i> F & F OD, OS
EOMs	FROM OD, OS
Cover Test	Ortho
Stereopsis	UTT (poor cooperation noted)
Ocular Health Evaluation	Normal

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## 2 year old Hispanic Female

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### Cycloplegic Retinoscopy

- - 5.00 -2.50 x 180 OD, OS

### Assessment / Plan

- High Myopia/Astigmatism
    - Rx given = -5.00 -1.50 x 180
    - RTC 1 month after Rx wear
-

# 2 year old Hispanic Female

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## Visit #2

- Tremendous compliance with Rx, Mom notes behavioral changes
    - No longer gets close to things
    - More attentive
    - More active
    - More emotionally connected
  
  - DVA: 20/32 OD, OS (Lea Symbols)
  
  - Stereopsis: (+) Fly
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# Bilateral Spherical Refractive Myopia

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## □ Prescribing Guidelines

- $\geq -5$  D - Rx at any age
- -3-5 D - Rx at 1-3 years of age
- -1-3 D - Rx if  $> 3$  years of age

*(Ciner)*

## □ Amblyopia Risks

- Isometropic Amblyopia risk @  $> -8$  D
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# ***HYPEROPIA***



# Question # 3

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■ ***What is the threshold amount of hyperopia for which you would prescribe eyeglasses in an orthophoric 1 year old?***

- a) +2.50 D or lower
  - b) +2.75 to +4.75 D
  - c) +5.00 to +7.00 D
  - d) +7.25 D or higher
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# Question # 3

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■ ***What is the threshold amount of hyperopia for which you would prescribe eyeglasses in an orthophoric 1 year old?***

a) +2.50 D or lower

b) +2.75 to +4.75 D

**c) +5.00 to +7.00 D**

d) +7.25 D or higher

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# Potentially Amblyogenic Refractive Errors

<b>Isometropic Amblyopia</b>	<b>Diopters</b>
Astigmatism	> 2.50
Hyperopia	> +5.00
Myopia	> -8.00

# Question # 4

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■ *Which is the threshold amount of hyperopia for which you would prescribe eyeglasses in an **orthophoric 2-3 year old**?*

- a) +2.50 D or lower
  - b) +2.75 to +4.75 D
  - c) +5.00 to +7.00 D
  - d) +7.25 D or higher
-

# Question # 4

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■ *Which is the threshold amount of hyperopia for which you would prescribe eyeglasses in an **orthophoric 2-3 year old**?*

a) +2.50 D or lower

**b) +2.75 to +4.75 D**

c) +5.00 to +7.00 D

d) +7.25 D or higher

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# ***Case Example***

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# Case Example

## 22 month old male

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Case findings	
Case History	Spina bifida w/ hydrocephalus Significant Developmental Delay (+) OT/PT/Speech/Developmental Therapy Asthma No visual complaints
Visual Acuity	F & F OD, OS
EOMs	FROM OD, OS
Kappa / Hirshberg	Ortho
Ocular Health Evaluation	Normal

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# 22 month old Hispanic Male

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## □ Cycloplegic Retinoscopy :

### ■ 14 months old

□ +5.00 - 3.50 x 180 OU

### ■ 18 months old

□ +4.00 - 2.00 x 180 OU

### ■ 22 months old

□ +4.00 -2.00 x 180 OU

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# 22 month old Hispanic Male

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## Assessment/Plan

### *Hyperopic Astigmatism OU*

Above age appropriate

Significant developmental delays

Rx given = +3.00 -1.50 x 180 OU

Follow-up 3-4 months

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# Question # 5

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■ ***In an orthophoric preverbal child with a +7.00 cycloplegic retinoscopy OU, what would you normally prescribe?***

- a) +7.00 D OU
  - b) +6.25 D OU
  - c) +3.00 to +4.00 D
  - d) Observe, no spectacles at this time
  - e) None of the above
-

# Question # 5

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■ ***In an orthophoric preverbal child with a +7.00 cycloplegic retinoscopy OU, what would you normally prescribe?***

- a) +7.00 D OU
  - b) +6.25 D OU
  - c) +3.00 to +4.00 D**
  - d) Observe, no spectacles at this time
  - e) None of the above
-

# ***Case Example***

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# Case Example

## 2 year female

Case findings			
Case History	C/o headaches and squinting No significant family ocular history No significant ocular or medical history		
Visual Acuity	DVA	20/200	OD, OS
	NVA	20/60	OD, OS
EOMs	FROM OD, OS		
Cover test sc	4Δ XP		
Dry Retinoscopy	OD	+7.00D	20/60
	OS	+7.00D	20/60
Cover Test with +7.00 D OU	14Δ IAXT		
Trial Frame	OD	+5.00D	20/25+
	OS	+5.00D	20/25+
Cover Test with +5.00 D OU	8Δ XP		

# Case Example

## 2 year old female

Case findings			
Dry Retinoscopy	OD	+7.00D	20/60
	OS	+7.00D	20/60
Cycloplegic Retinoscopy	OD	+7.50D	
	OS	+7.50D	
Rx given	OD	+4.50D	
	OS	+4.50D	

# Bilateral Spherical Refractive Hyperopia

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## □ Prescribing Guidelines

- $< +2$  D - do not Rx until 5 years of age
  - Excluding
    - esophoria
    - esotropia
    - Amblyopia
  
- $\geq +2$  D - consider Rx with attention to :
  - excessive accommodative effort
  - risk of amblyopia or strabismus
    - Monitor at risk patients every 3 months
    - Monitor lower amounts at 6 months of age, 1 y.o., 2-3 y.o. years, and 5 years **(Ciner)**

## □ Amblyopia Risks

- Isometropic Amblyopia risk @  $> +5$  D
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# ***ASTIGMATISM***

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# Question # 6

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- ***What is the threshold amount of symmetrical astigmatism in which you would prescribe eyeglasses in a **1 year old**?***
    - a) 1 diopter or less
    - b) 1.25 to 2.00 D
    - c) 2.25 to 3.00 D
    - d) 3.25 D or higher
-

# Question # 6

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- ***What is the threshold amount of symmetrical astigmatism in which you would prescribe eyeglasses in a **1 year old**?***
    - a) 1 diopter or less
    - b) 1.25 to 2.00 D
    - c) 2.25 to 3.00 D
    - d) 3.25 D or higher***
-

# Case Example

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*11 month old Hispanic Male*

# ***Astigmatism – Case Example***

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- **Age** = 11 month old hispanic male
  
  - **Systemic History**
    - Microcephaly
      - Microcephaly is a medical condition in which the circumference of the head is smaller than normal because the brain has not developed properly or has stopped growing. Microcephaly can be present at birth or it may develop in the first few years of life.
    - Seizure disorder
      - Kepra d/c at 12 months
    - Developmental delay
      - (+)OT and (+)PT
-

## *Astigmatism – Case Example*

### *Visit #1, 11 month old male*

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<b>Case findings</b>	
Visual Acuity	Fixate and Follow OD, OS
EOMs	FROM OD, OS
Kappa / Hirschberg	Ortho <i>No X(T) noted</i>
Bruckner	(+) Bifixation
Cycloplegic Retinoscopy	pl -5.00 x 180 OD,OS
Ocular Health Evaluation	Normal

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# Astigmatism – Case Example

## Visit #2, 14 month old male (3 month FU)

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Case findings	
Visual Acuity	Fixate and Follow OD, OS
EOMs	FROM OD, OS
Kappa / Hirschberg	Ortho <i>No X(T) noted</i>
Bruckner	(+) Bifixation
Cycloplegic Retinoscopy	pl -4.50 x 180 OD,OS
Ocular Health Evaluation	Normal

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# Astigmatism – Case Example

## Visit #3, 17 month old male, 3 month FU

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Case findings	
Visual Acuity	Fixate and Follow OD, OS
EOMs	FROM OD, OS
Kappa / Hirschberg	30Δ X(T) <i>Only noted with prolonged dissociation</i> <i>Low frequency, good fusion</i>
Bruckner	(+) Bifixation
Cycloplegic Retinoscopy	pl -4.50 x 180 OD,OS
Rx given	pl -3.50 x 180 OD,OS

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# ***Astigmatism – Case Example***

*Visit #4, 19 month old male (2 month FU with RX)*

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- **Per Mom:**
    - “loves Rx, does not take them off, more alert and active”
  
  - **Kappa / Hirschberg** – 20Δ X(T)
    - Only noted with prolonged dissociation
    - Very low frequency, good fusion
  
  - RTC 4 months
-

# Question # 7

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■ ***What is the threshold amount of symmetrical astigmatism in which you would prescribe eyeglasses in a **2-3 year old**?***

- a) 1 diopter or less
  - b) 1.25 to 2.00 D
  - c) 2.25 to 3.00 D
  - d) 3.25 D or higher
-

# Question # 7

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■ ***What is the threshold amount of symmetrical astigmatism in which you would prescribe eyeglasses in a 2-3 year old?***

- a) 1 diopter or less
  - b) 1.25 to 2.00 D**
  - c) 2.25 to 3.00 D
  - d) 3.25 D or higher
-

# Case Example

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## *Siblings*

*2 year old female*

*3 year old female*

# ***Siblings***

*2 year old female*

*3 year old female*

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## □ *Case History (Identical)*

- Full Term
  - No developmental delay is reported
  - Mom notes difficulty with distance vision (close to TV) and a close working distance (at near) in both kids
  - No eye turn in 3 y.o, suspects IET in 2 year old
  - Great deal of squinting
  - Mom has high Rx (hyperopia and astigmatism)
-

# 3 year old female

Visit #1	
Visual Acuity (Lea)	20/30 OU <i>Distance and near UTT monocular VA</i>
EOMs	FROM OD, OS
Distance/Near Cover Test	orthophoria
Stereopsis (Lang)	(+) <i>RDS</i> (+) <i>Fly</i>
Cycloplegic Retinoscopy	+3.50 -2.50 x 180 OD +3.50 -1.50 x 180 OS
Ocular Health Evaluation	Normal

# 3 year old female

## Visit #1

Assessment

Hyperopia/Astigmatism  
*Above age expected*

Plan

*No Rx today  
RTC 3 months re-cyclo  
Determine if anisometropic astigmatism is  
stable  
Repeat VA with trial frame based on today  
retinoscopy*

# 2 year old female

## Visit #2

Additional Case history	<i>Mom brought patient in July 2015 Suspicious of ET</i>
Visual Acuity	F & F OD, OS <i>Teller VA 20/94 OU</i>
EOMs	FROM OD, OS
Distance/Near Cover Test	orthophoria
Stereopsis	<i>UTT</i>
Cycloplegic Retinoscopy	+3.00 -2.00 x 180 OD +3.00 -2.00 x 180 OS
Ocular Health Evaluation	Normal



# 2 year old female

## Visit #2

Assessment	Hyperopia/Astigmatism <i>Above age expected</i>
Plan	<i>No Srx released Monitor in 3 months repeat cyclo for stability Determine if astigmatism is stable OU Stable/central reflexes on Hirschberg Kappa - no eye turn observed today (likely pseudo ET)</i>

# Siblings

## 3 month follow up

Entering data	<i>No change</i>
<i>Cycloplegic Retinoscopy 2 year old</i>	<i>+3.00 -2.50 x180 +3.00-3.00 x 180</i>
Rx given 2 year old	<i>+1.50 -2.00 x180 +1.50 -2.00 x 180</i>
<i>Cycloplegic Retinoscopy 3 year old</i>	<i>+4.50 -2.50 x 180 OD +4.50 -2.50 x 180 OS</i>
Rx given 3 year old	<i>+2.50 -2.00 x 180 OD +2.50 -2.00 x 180 OS</i>
<p><i>Rx given 1st Rx Mom concerned about squinting and very close working distance and close to TV Strong family history of same refractive error FTW of Rx RTC 6 months, increased maturity Repeat VA and stereo</i></p>	

# ***Case Example***

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# Case Example

## 3 year old male

Case findings	
Case History	Close working distance, Mom notes squinting, no strabismus reported
Visual Acuity <i>Distance and near</i>	20/100 OD, OS
EOMs	FROM OD, OS
Cover test	6Δ XP
Retinoscopy/Rx given	-1.50 -2.75 x 010 20/40- -1.00 -2.75 x 170 20/40-
Ocular Health Evaluation	Normal
3 month Follow-up	-1.50 -2.75 x 010 20/25 -1.00 -2.75 x 170 20/25 OU 20/20

# Bilateral Spherical Refractive Astigmatism

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## □ Prescribing Guidelines

### ■ Research

- Large amounts common < 3 years of age
  - born with > 2D
  - 1D by 3 years of age

### ■ Management

- Do not correct before 1 year, but monitor frequently < 3 years
- Prescribe when
  - Child  $\geq 3$  years of age
  - Magnitude > 1.25 D
  - Stable over 3 visits

*(Ciner)*

## □ Amblyopia Risks

- Isometropic Amblyopia risk @ > 2.50 D
-

# Potentially Amblyogenic Refractive Errors

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<b>Anisometropic Amblyopia</b>	<b>Diopters</b>
Astigmatism	> 1.50
Hyperopia	> +1.50
Myopia	> -3.00

# ***ANISOMETROPIA***

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# Question # 8

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- Assuming no strabismus is present, **what difference** in refraction would you consider significant enough to prescribe eyeglasses in a **preverbal child** with **hyperopic anisometropia**?

- a) +0.25 to +0.75 D
  - b) +1.00 to +1.50 D
  - c) +1.75 to +2.25 D
  - d) +2.50 D or higher
-



# Question # 8

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□ **Assuming no strabismus is present, *what difference* in refraction would you consider significant enough to prescribe eyeglasses in a *preverbal child* with *hyperopic anisometropia*?**

a) +0.25 to +0.75 D

b) +1.00 to +1.50 D

**c) +1.75 to +2.25 D**

d) +2.50 D or higher

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# Hispanic female

## 7 months- 2 years

7 months old <i>Brother is a +7D hyperope</i>	OD +1.50 -0.50 x 180 OS +3.50 -2.00 x 180
10 months old	OD +2.00 -0.50 x 180 OS +4.50 -1.00 x 180
1 year old	OD +2.00 -1.00 x 180 OS +4.50 -1.00 x 180
	Rx given OD +0.50 -0.50 x 180 OS +3.00 -0.50 x 180
1 year and 6 months old	Stable VA, 20/30 OD, 20/40 OS <i>Poor compliance with Rx wear</i>
2 years old	VA OS sc 20/80 VA OS cc 20/40

# Family

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4 year old sister	OD +3.00 -1.00 x 180 OS +5.50 -1.00 x 180
7 year old brother	OD +5.50 sph OS +5.50 sph
9 month old sister	OD +6.00 -2.00 x 180 OS +6.00 -2.00 x 180

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# Question # 9

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***Assuming no strabismus is present, what difference in refraction would you consider significant enough to prescribe eyeglasses in a preverbal child with myopic anisometropia? (Assume one eye is plano)***

- a) -0.75 to -1.50 D
  - b) -1.75 to -2.50 D
  - c) -2.75 to -3.50 D
  - d) -3.75 to -4.50 D
  - e) -4.75 D or higher
-

# Question # 9

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□ **Assuming no strabismus is present, what difference in refraction would you consider significant enough to prescribe eyeglasses in a preverbal child with myopic anisometropia? (Assume one eye is plano)**

a) -0.75 to -1.50 D

b) -1.75 to -2.50 D

c) -2.75 to -3.50 D

**d) -3.75 to -4.50 D**

e) -4.75 D or higher

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# ***Case Example***

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# Case Example

## 18 month old female

Case findings	
Case History	Failed pediatrician screening FT, no complications pregnancy or delivery No systemic complications No Developmental delay
Visual Acuity	F & F OD, OS <i>TAC 20/130 OU</i>
EOMs	FROM OD, OS
Kappa Hirschberg	Ortho
Retinoscopy <i>Dry and Cycloplegic</i>	-3.00 -0.50 x 090      +0.50D sph
Ocular Health Evaluation	Normal

# ***Myopia – Case Example***

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## **Assessment**

- Anisometropia, Amblyogenic risk factor OD
- Myopia OD, OS
- Minimal Hyperopia OS

## **Plan**

- RTC 3 months
  - Repeat cycloplegic refraction, determine stability of the RX
  - Re-evaluate posture / fusion
-



# Question # 10

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- What would you prescribe for a child with **-11.50D of myopia** in one eye?***

***(Assume the other eye is plano)***

- a) spectacles (plano & -11.50D)
  - b) spectacles (plano polycarb. OU)
  - c) spectacles (plano & -4.00 polycarb)
  - d) -10.25 D contact lenses
  - e) None of the above
-

# Question # 10

---

- What would you prescribe for a child with **-11.50D of myopia** in one eye?***

***(Assume the other eye is plano)***

- a) spectacles (plano & -11.50D)
  - b) spectacles (plano polycarb. OU)
  - c) spectacles (plano & -4.00 polycarb)
  - d) *-10.25 D contact lenses***
  - e) None of the above
-

# ***Case Example***

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# Case Example

## 2 year old female

Case findings	
Case History	Normal birth and developmental history Rubs/tugs left eye as per Mom (-) Family ocular history for strabismus and/or high refractive error
Visual Acuity	OD 20/80 OS F & F
EOMs	FROM OD, OS
Kappa Hirschberg	Ortho
Retinoscopy <i>Dry and Cycloplegic</i>	-1.50 sphere                      -10.00 sph
Ocular Health Evaluation	Normal

# Myopic Anisometropia

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## □ Assessment / Plan

- Anisometropic Amblyopia OS
  - Myopia OD
  
  - SCL Fit OS (disposable/ EW)
  - Spectacles over CLS
-

# Question # 11

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- ***Assuming no strabismus is present, what difference in refraction would you consider significant enough to prescribe eyeglasses in a preverbal child with astigmatic anisometropia? (Assume one eye is plano)***
    - a) 1 diopter or less
    - b) 1.25 to 2.00 D
    - c) 2.25 to 3.00 D
    - d) 3.25 D or higher
-

# Question # 11

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- ***Assuming no strabismus is present, what difference in refraction would you consider significant enough to prescribe eyeglasses in a preverbal child with astigmatic anisometropia? (Assume one eye is plano)***
    - a) 1 diopter or less
    - b) 1.25 to 2.00 D
    - c) 2.25 to 3.00 D**
    - d) 3.25 D or higher
-

# Potentially Amblyogenic Refractive Errors

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Anisometropic Amblyopia	Diopters
<i>Astigmatism</i>	> 1.50
Hyperopia	> +1.50
Myopia	> -3.00



# Anisometropia

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## Research

- Instability - fluctuations common until 4 years of age
- Significant relationship to amblyopia and strabismus

## Management

- < 3 years of age - monitor (especially hyperopic, antimetropia, cylindrical)
- Monitor all types for binocular vision problems

*(Ciner)*

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# Prescribing Guidelines for Anisometropia

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## □ Prescribe when:

- Magnitude  $> 1$  D
- Stable over 3 visits, 3 months apart
- child  $> 3$  years of age
- VA or binocularity is below normal
- Rx full correction (it equalizes the accommodative response)

***(Ciner)***

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# Potentially Amblyogenic Refractive Errors

<b>Isometropic Amblyopia</b>	<b>Diopters</b>
Astigmatism	> 2.50
Hyperopia	> +5.00
Myopia	> -8.00

<b>Anisometropic Amblyopia</b>	<b>Diopters</b>
Astigmatism	> 1.50
Hyperopia	> +1.50
Myopia	> -3.00

# ***Binocular Vision Problems Enter the Picture....***

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# Question # 12

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***What is the least amount of hyperopia for which you would prescribe eyeglasses in a child **one year of age** or younger, if the child has 30 prism diopters of esotropia?***

- a) +1.00 to +2.00 D
  - b) +2.25 to +3.00 D
  - c) +3.25 to +4.00 D
  - d) +4.25 D or higher
-

# Question # 12

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***What is the least amount of hyperopia for which you would prescribe eyeglasses in a child **one year of age** or younger, if the child has 30 prism diopters of esotropia?***

a) +1.00 to +2.00 D

b) +2.25 to +3.00 D

**c) +3.25 to +4.00 D**

d) +4.25 D or higher

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# ***Case Example***

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# Case Example

## 2 year old female

Case findings	
Case History	Normal birth and development hx Unremarkable medical hx c/o eye turn in since shortly after birth
Visual Acuity	F & F OD, OS
EOMs	FROM OD, OS (1+) OAI/O OD, OS
Kappa Hirschberg	35 Δ CAET' NCT w/ +2.00 D: 35 Δ CAET'
Cycloplegic Retinoscopy	OD +1.00 -1.00 x 160 OS +1.50 sph
Ocular Health Evaluation	Normal



# 2 year old Hispanic Female

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- Assessment / Plan
    - Infantile Esotropia
      - Constant
      - No amblyogenic risk
      - Surgical referral
-

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# Infantile Esotropia

## Clinical Characteristics

Onset 6-12 months

Constant , large angle (30-60 $\Delta$ )

Comitant Deviation

Refractive Error normal range

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# Infantile Esotropia

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- Amblyopia Risk Factors involving Strabismus
    - ***Strabismic Amblyopia***
      - **Unilateral Strabismus**
      - **Constant Strabismus**
      - Present at Distance and Near Fixation
      - Present in All Fields of Gaze
  
  - *Must be present **BEFORE** 6 years of age...*
-

# Question # 13

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***What is the least amount of hyperopia for which you would prescribe eyeglasses in a child **2-3 years of age**, if the child has **30 prism diopters of esotropia**?***

- a) +1.00 to +2.00 D
  - b) +2.25 to +3.00 D
  - c) +3.25 to +4.00 D
  - d) +4.25 or higher
-

# Question # 13

---

□ *What is the least amount of hyperopia for which you would prescribe eyeglasses in a child **2-3 years of age**, if the child has **30 prism diopters of esotropia**?*

a) +1.00 to +2.00 D

**b) +2.25 to +3.00 D**

c) +3.25 to +4.00 D

d) +4.25 or higher

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# ***Case Example***

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# Case Example

## 4 year old female

Case findings	
Case History	FT birth / (-) developmental delay c/o eye turn IN since birth
Visual Acuity	OD 20/30 OS 20/30
EOMs	FROM OD, OS 3+ OAIO OD, OS
Near Cover Test	40-60 $\Delta$ CAET <i>variable</i>
Near Cover Test with +2D OU	40-60 $\Delta$ CAET
Stereopsis	(-) Fly, (-) RDS
Cycloplegic retinoscopy	+ 2.50 sph OD, OS
Ocular Health Evaluation	Normal

# 4 year old African American Female

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## Assessment / Plan

- **Infantile Esotropia** – no accommodative component
    - Constant, large magnitude, (-) stereopsis*
    - Attempted Rx wear x 1 month, minimal compliance, no change in magnitude of ET with Rx*
    - Surgical consult*
-



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## Accommodative Esotropia

### Clinical Characteristics

Onset, 6 months - 7 years (\*2.5)  
*gradual - intermittent*

Magnitude of Strabismus N > D

Amblyopia rare at onset

Normal Correspondence

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---

## Accommodative Esotropia

### Mechanism

*Uncorrected hyperopia (+2.00 - +7.00)*

*High AC/A ratio (with low hyperopia)*

### Combination

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# ***Case Example***

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## 3 year old male

### Exam #1 - 2013

Chief complaint	<i>Mom notes RE turns IN x 1 year Greatest when focusing on near tasks Preschool teacher also notices</i>
Visual Acuity (Lea) sc	Distance 20/80 OD, OS Near 20/30 OU <i>Noted poor cooperation and understanding</i>
EOMs	FROM OD, OS
Pupils	PERRLA, (-) APD OD, OS
Cover Test	Distance orthophoria
	Near 25Δ IAET
Stereopsis sc	(-) Fly

## 3 year old male

### Exam #1 -2013

Chief complaint	<i>Mom notes RE turns IN x 1 year Greatest when focusing on near tasks Preschool teacher also notices</i>
Dry retinoscopy	+3.50 -0.75 x 090 OU
Near CT with +3D OU	10Δ Esophoria
Cycloplegic retinoscopy	+7.00 -1.00 x 180 OU
Rx given	+5.00 -1.00 x 180 OU

# Assessment / Plan

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## □ Accommodative Esotropia

- Superb control with plus
  - Rx given RTC one month after Rx dispense, re-test VA (Attempt Lea) do Lang and stereo fly repeat CT with RX
-

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## Accommodative Esotropia

### Clinical Characteristics

Onset, 6 months - 7 years (\*2.5)  
*gradual - intermittent*

Magnitude of Strabismus N > D

Amblyopia rare at onset

Normal Correspondence

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# ***Bifocals in Children....***

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# Question # 14

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■ ***How often would you prescribe bifocals in orthophoric children with myopia?***

- a) always
  - b) frequently
  - c) sometimes
  - d) never
-

# Question # 14

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■ ***How often would you prescribe bifocals in orthophoric children with myopia?***

- a) always
  - b) frequently
  - c) sometimes**
  - d) never
-

# ***Case Example***

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# 10 year old female

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## **Case History**

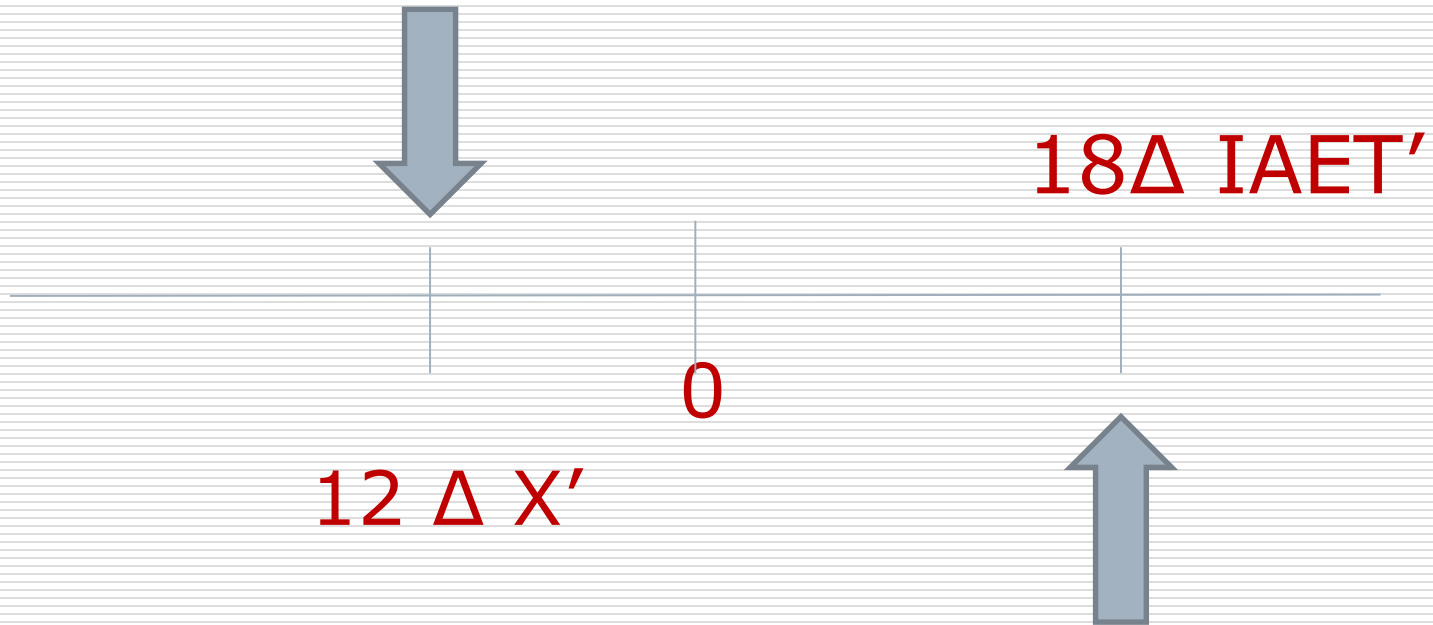
- c/o distance blur without Rx OD, OS
  - Lost Rx several months ago
  - 1<sup>st</sup> Rx at 7 years old
  - c/o difficulty with near work when wearing Rx
  - (+) Asthenopia and headaches cc
    - Worsens at end of day
    - Extreme fatigue with near work
    - Not present without Rx
  
  - Medical history
    - Heart defect
      - entering hospital next day for surgical procedure with extended stay
    - NKMA
-

# 10 year old female

Initial Findings		
Visual Acuity sc	Distance	Near
	20/300 OD, OS	20/20 OD, OS
Cover Test sc	----	12Δ X'
Retinoscopy = Subjective	-4.25 -0.75 x 090 -4.50 sph	20/20 20/20
Cover Test cc	ortho	18Δ IAET
Near Prism Bar Vergences cc	Base In x/8/4	Base Out x/25/20
Cover Test with +2.00D	----	4Δ E'
Near Prism Bar Vergences with +2.00D	Base In x/12/10 x/12/7	Base Out x/20/16 x/23/16

# AC/A ratio

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$$AC/A \text{ ratio} = 12 X' \leftrightarrow 18 E' = 30 / 4 = 7.5/1$$

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# 10 year old female

Accommodative Testing		
	OD	OS
Minus Lens Amplitude (age expected = 10.5D)	5.50D	5.0D
NRA/PRA	+2.25/-1.25	
Binocular Accommodative Facility	2.0 cpm (difficulty with minus)	
Monocular Accommodative Facility	4.0 cpm (difficulty with minus)	
MEM	+0.50 D all meridians	

# 10 year old Female

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## □ **Assessment**

- Myopia OU
- Convergence Excess
- Accommodative Insufficiency

## □ **Plan**

- Rx given

□ OD                                -4.00 -0.75 x 090

□ OS                                -4.50 sphere

+2.00 Add

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# Question # 15

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- ***How often would you prescribe bifocals in children with high AC/A ratios not corrected at near by their hyperopic eyeglasses?***
    - a) always
    - b) frequently
    - c) sometimes
    - d) never
-

# Question # 15

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- *How often would you prescribe bifocals in children with high AC/A ratios not corrected at near by their hyperopic eyeglasses?*
    - a) always
    - b) frequently**
    - c) sometimes
    - d) never
-

# Question # 16

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- *In a young child with an **accommodative esotropia** not controlled at near with full hyperopic correction, how much **esotropia at near** would necessitate the use of **bifocals** in your patient?*
- a)  $8\Delta$  or less
  - b)  $9 - 15\Delta$  or less
  - c)  $16 - 24\Delta$  or less
  - d)  $25\Delta$  or higher
  - e) None of the above
-

# Question # 16

---

- *In a young child with an **accommodative esotropia** not controlled at near with full hyperopic correction, how much **esotropia at near** would necessitate the use of **bifocals** in your patient?*
- a)  $8\Delta$  or less
  - b) 9 – 15 $\Delta$  or less**
  - c) 16 – 24 $\Delta$  or less**
  - d)  $25\Delta$  or higher
  - e) None of the above
-

# Question # 17

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***How often do you prescribe **minus lenses** in emmetropic, or slightly hyperopic children with **intermittent exotropia**?***

- a) always
  - b) frequently
  - c) sometimes
  - d) never
-

# Prescribing Review

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- ❑ Isometropic Amblyogenic Risk Factors
  - ❑ Anisometropic Amblyogenic Risk Factors
  - ❑ Strabismic Amblyogenic Risk Factors
  - ❑ Visual Function / Visual Acuity
  - ❑ Soft Binocular Vision Disorders
  - ❑ Prescribing Guidelines
- 
- *Each patient is an individual*
  - *Each practitioner has individual preferences*
-

# ***QUESTIONS?***

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