Q

- Primary Congenital Glaucoma
  - Evident at 'age' or within period of time





- Primary Congenital Glaucoma
  - Evident at birth or within first few years



# 3

- Primary Congenital Glaucoma
  - Evident at birth or within first few years
  - 1/ # live births



- Evident at birth or within first few years
- 1/10K live births





- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...

```
unilateral
v bilateral
```



- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral



- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - male vs female

- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - bilateral
  - male



## 9

- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - .. male
  - ...diagnosed by age

- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - male
  - ...diagnosed by age 6 months





- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - ...male
  - ...diagnosed by age 6 months
- Associated genetically with POAG?

yes/ no

# 12

- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - ...male
  - ...diagnosed by age 6 months
- Associated genetically with POAG? No

# 13

- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - male
  - ...diagnosed by age 6 months
- Associated genetically with POAG? No
- Is secondary to structure dysplasia in the absence of other

# 14

- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - ...male
  - ...diagnosed by age 6 months
- Associated genetically with POAG? No
- Is secondary to angle dysplasia in the absence of other ocular or systemic abnormalities

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## Primary Congenital Glaucoma

- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - ...male
  - ...diagnosed by age 6 months
- Associated genetically with POAG? No
- Is secondary to angle dysplasia in the absence of other ocular or systemic abnormalities

What if other ocular and/or systemic abnormalities are present?



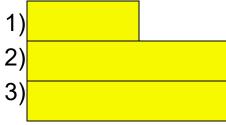
- Evident at birth or within first few years
- 1/10K live births
- 2/3 are...
  - ...bilateral
  - ...male
  - ...diagnosed by age 6 months
- Associated genetically with POAG? No
- Is secondary to angle dysplasia in the absence of other ocular or systemic abnormalities

What if other ocular and/or systemic abnormalities are present?
Would be **secondary** congenital glaucoma (or confusingly, primary **developmental** glaucoma)





- Primary Congenital Glaucoma
  - Clinical presentation
    - The classic triad of signs/symptoms:









- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) **Epiphora**
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**









Epiphora

Photophobia/blepharospasm

Congenital glaucoma: The triad





- Primary Congenital Glaucoma
  - Clinical presentation
    - The classic triad of signs/symptoms:
      - 1) Epiphora (common misdiagnosis: Congenital

three words

- 2) **Photosensitivity**
- 3) **Blepharospasm**



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**ia



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema





Congenital glaucoma: Corneal cloudiness

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- Primary Congenital Glaucoma
  - Clinical presentation
    - The classic triad of signs/symptoms:
      - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
      - 2) Photosensitivity
      - 3) **Blepharospas**

Cornea:

Cloudiness 9

The scenario of an infant with cloudy corneas should immediately bring to mind a mnemonic. Which one?



- Primary Congenital Glaucoma
  - Clinical presentation
    - The classic triad of signs/symptoms:
      - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
      - 2) Photosensitivity
      - 3) Blepharospasi

Cornea:

Cloudiness 9

The scenario of an infant with cloudy corneas should immediately bring to mind a mnemonic. Which one? **STUMPED** 

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- Primary Congenital Glaucoma
  - Clinical presentation
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      - 2) Photosensitivity
      - 3) Blepharospasi

Cornea:

Cloudiness

The scenario of an infant with cloudy corneas should immediately bring to mind a mnemonic. Which one? **STUMPED** 

Why?

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- Primary Congenital Glaucoma
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      - 2) Photosensitivity
      - 3) Blepharospasi

Cornea:

Cloudiness

The scenario of an infant with cloudy corneas should immediately bring to mind a mnemonic. Which one? **STUMPED** 

Why? Coming in hot...



- S
- T
- U
- M
- P
- E
- D

What is the purpose of the STUMPED mnemonic, ie, what does it help to remember?



- S
- T
- U
- M
- P
- E
- D

What is the purpose of the STUMPED mnemonic, ie, what does it help to remember?
The DDx for a cloudy cornea in an infant



• S

Start here (there are two S's)

- T
- U
- **M**
- P
- E
- [



- Sclerocornea; congenital hereditary Stromal dystrophy
- T

next

- **U**
- M
- P
- E
- D



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- (Tears in Descemet's membrane works too)
- M
- P
- E
- D



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)

• U next

- M
- P
- **E**
- D



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- Ulcer
- M next
- P
- E
- D



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- Ulcer
- Metabolic disorders
- P next
- E
- D



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- Ulcer
- Metabolic disorders
- Peters anomaly
- next (there are two E's)
- D



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- Ulcer
- Metabolic disorders
- Peters anomaly
- Elevated IOP; Endothelial dystrophy (CHED)
- D (*Edema* works too)



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- Ulcer
- Metabolic disorders
- Peters anomaly
- Elevated IOP; Endothelial dystrophy (CHED)
- D finally



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- Ulcer
- Metabolic disorders
- Peters anomaly
- Elevated IOP; Endothelial dystrophy (CHED)
- Dermoid of the cornea



- Sclerocornea; congenital hereditary Stromal dystrophy
- Trauma (endothelial; ie, from forceps)
- Ulcer
- For more on the STUMPED mnemonic, see slide-set K9)
- Peters anomaly
- Elevated IOP; Endothelial dystrophy (CHED)
- Dermoid of the cornea



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - eponym striae





- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae

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- Primary Congenital Glaucoma
  - Clinical presentation
    - The classic triad of signs/symptoms:
      - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
      - 2) **Photosensitivity**
      - 3) Blepharospasm
    - Cornea:

Haab striae represent what sort of pathology, ie, which corneal structure is damaged, and in what way?

- Cloudiness sed
- Haab's striae

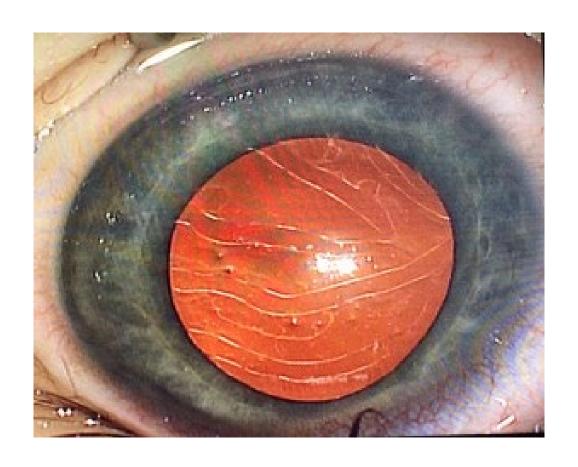


- Primary Congenital Glaucoma
  - Clinical presentation
    - The classic triad of signs/symptoms:
      - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
      - 2) **Photosensitivity**
      - 3) Blepharospasm
    - Cornea:

Haab striae represent what sort of pathology, ie, which corneal structure is damaged, and in what way?

- Cloudiness sec Tears in Descemet's secondary to corneal stretching
- Haab's striae





Congenital glaucoma: Haab striae

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- Primary Congenital Glaucoma
  - Clinical presentation
    - The classic triad of signs/symptoms:
      - 1) Epiphora (common misdiagnosis: Congenital acrimal sac obstruction
      - 2) Photosensitivity
      - 3) Blepharospasm
    - Cornea:

Haab striae represent what sort of pathology, ie, which corneal structure is damaged, and in what way? Tears in Descemet's secondary to corneal stretching

- Haab's striae

What is the mechanism?



- Primary Congenital Glaucoma
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    - The classic triad of signs/symptoms:
      - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction
      - 2) **Photosensitivity**
      - 3) Blepharospasm
    - Cornea:

Haab striae represent what sort of pathology, ie, which corneal structure is damaged, and in what way? Tears in Descemet's secondary to corneal stretching

• Cloudiness sec

Haab's striae

What is the mechanism?

Mechanical deformation caused by the elevated IOP



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > mm



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy # ; age 7 years #



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years ~14





- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years ~14
    - In congenital glaucoma:
      - # unanaesthetized



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years ~14
    - In congenital glaucoma:
      - 30-40 unanaesthetized



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years ~14
    - In congenital glaucoma:
      - 30-40 unanaesthetized
      - # even under anesthesia



- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) **Photosensitivity**
    - 3) **Blepharospasm**
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years ~14
    - In congenital glaucoma:
      - 30-40 unanaesthetized
      - >20 even under anesthesia



## Primary Congenital Glaucoma

- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) Photosensitivity
    - 3) Blepharospasm
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years -14
    - In congenital glaucoma:
      - 30-40 unanaesthetized
      - >20 even under anesthesia

General anesthetic(s) that raise IOP:



## Primary Congenital Glaucoma

- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) Photosensitivity
    - 3) Blepharospasm
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years -14
    - In congenital glaucoma:
      - 30-40 unanaesthetized
      - >20 even under anesthesia

General anesthetic(s) that raise IOP: **Ketamine** 



## Primary Congenital Glaucoma

- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) Photosensitivity
    - 3) Blepharospasm
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years ~14
    - In congenital glaucoma:
      - 30-40 unanaesthetized
      - >20 even under anesthesia

General anesthetic(s) that raise IOP: **Ketamine** 

General anesthetic(s) that lower IOP:



## Primary Congenital Glaucoma

- Clinical presentation
  - The classic triad of signs/symptoms:
    - 1) Epiphora (common misdiagnosis: Congenital lacrimal sac obstruction)
    - 2) Photosensitivity
    - 3) Blepharospasm
  - Cornea:
    - Cloudiness secondary to edema
    - Haab's striae
    - Horizontal diameter > 11.5 mm
  - IOP:
    - Normal IOP: Infancy 10-12; age 7 years ~14
    - In congenital glaucoma:
      - 30-40 unanaesthetized
      - >20 even under anesthesia

General anesthetic(s) that **raise** IOP: **Ketamine** 

General anesthetic(s) that **lower** IOP: **Pretty much everything else** 



- Natural history if untreated:
  - Progresses to









- Primary Congenital Glaucoma
  - Natural history if untreated:
    - Progresses to NLP

(NLP = No light perception)



- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - bad sequelae 1 and bad sequelae 2







- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - Opacifies and vascularizes





Congenital glaucoma: Corneal opacification, vascularization



- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - Opacifies and vascularizes
    - diameter#(mm)





- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - Opacifies and vascularizes
    - diameter ~17 mm



- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - Opacifies and vascularizes
    - diameter ~17 mm
  - Pseudoproptosis 2° to translation: ox's eye (enlargement of globe secondary to chronically elevated IOP)





- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - Opacifies and vascularizes
    - diameter ~17 mm
  - Pseudoproptosis 2º to buphthalmos (enlargement of globe secondary to chronically elevated IOP)





Congenital glaucoma: Pseudoproptosis 2ndry to buphthalmos



- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - Opacifies and vascularizes
    - diameter ~17 mm
  - Pseudoproptosis 2º to buphthalmos (enlargement of globe secondary to chronically elevated IOP)
  - Amblyopia







- Natural history if untreated:
  - Progresses to NLP
  - Cornea...
    - Opacifies and vascularizes
    - diameter ~17 mm
  - Pseudoproptosis 2° to buphthalmos (enlargement of globe secondary to chronically elevated IOP)
  - Amblyopia common