When the doctor sees nothing and the patient sees nothing, the diagnosis is αμβλυωπια.

- Hippocrates, 450 BCE

AMBLYOPIA: DEFINITION

- Abnormal visual development
- Decreased best-corrected visual acuity
- Unilateral or bilateral
- Apparently normal physical exam, but may also result from recognizable structural abnormalities

AMBLYOPIA: SIGNIFICANCE

- 2%–4% of U.S. population affected
- Commonly unilateral
- Bilateral amblyopia (rare) may mean permanently decreased visual acuity

SCREENING: IMPORTANCE

- Amblyopia is usually preventable or treatable
- Early detection is key to effective treatment
- Life-threatening disorders may present as amblyopia
- Screening responsibility rests with primary care physician

In most circumstances, amplyopia can be prevented or treated.

EARLY DETECTION: IMPORTANCE

- Visual function develops early in life
- Treatment depends on plasticity of visual system
- Treatment less likely to be effective as children age

Decreased vision → retinoblastoma?

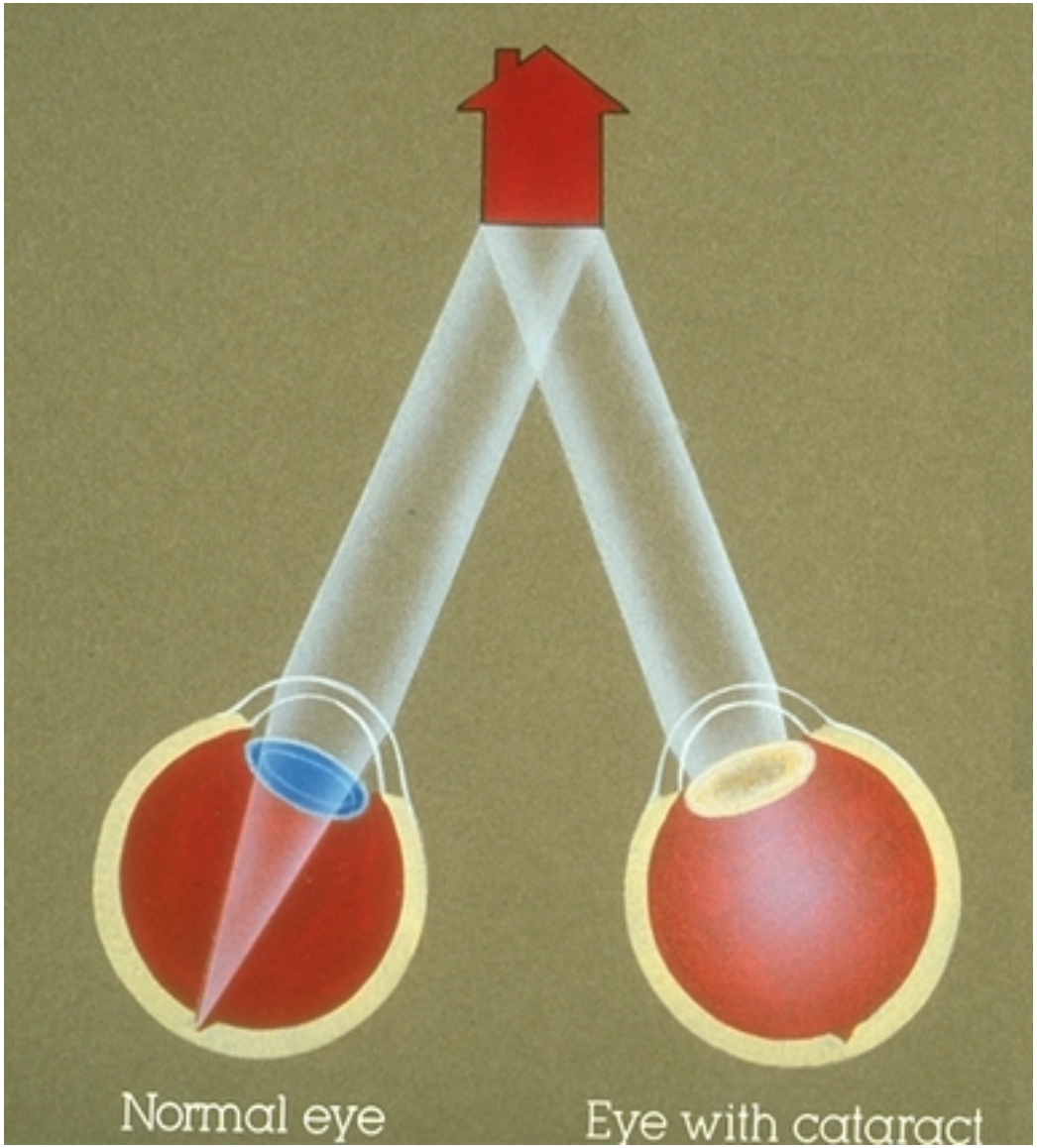
The ophthalmologist treats amblyopia, but the primary care physician detects amblyopia.

PREVENTING AMBLYOPIA: CONSIDERATIONS

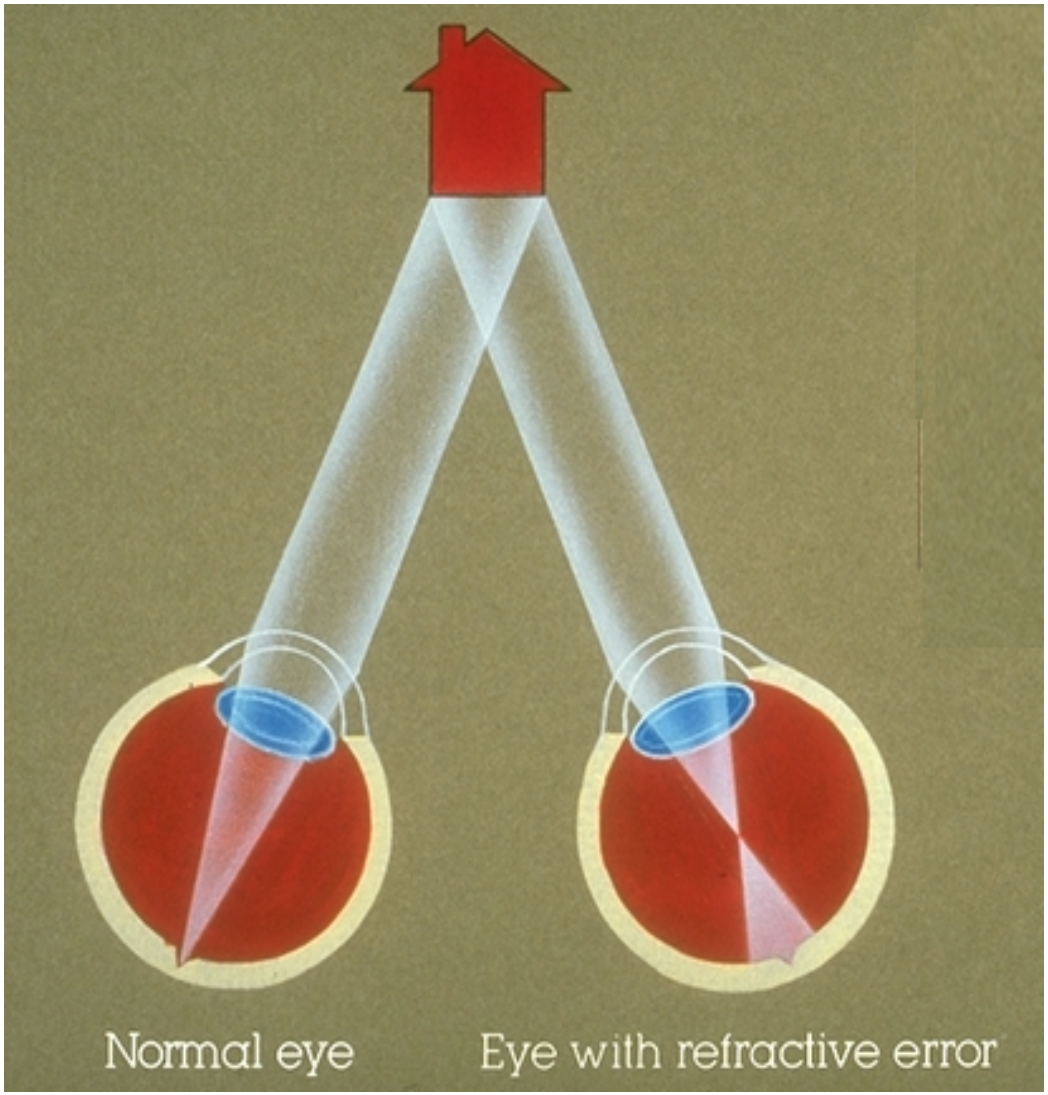
- Predisposing factors
- Presenting features
- Detection methods
- Treatment rationale

AMBLYOPIA: PREDISPOSING FACTORS

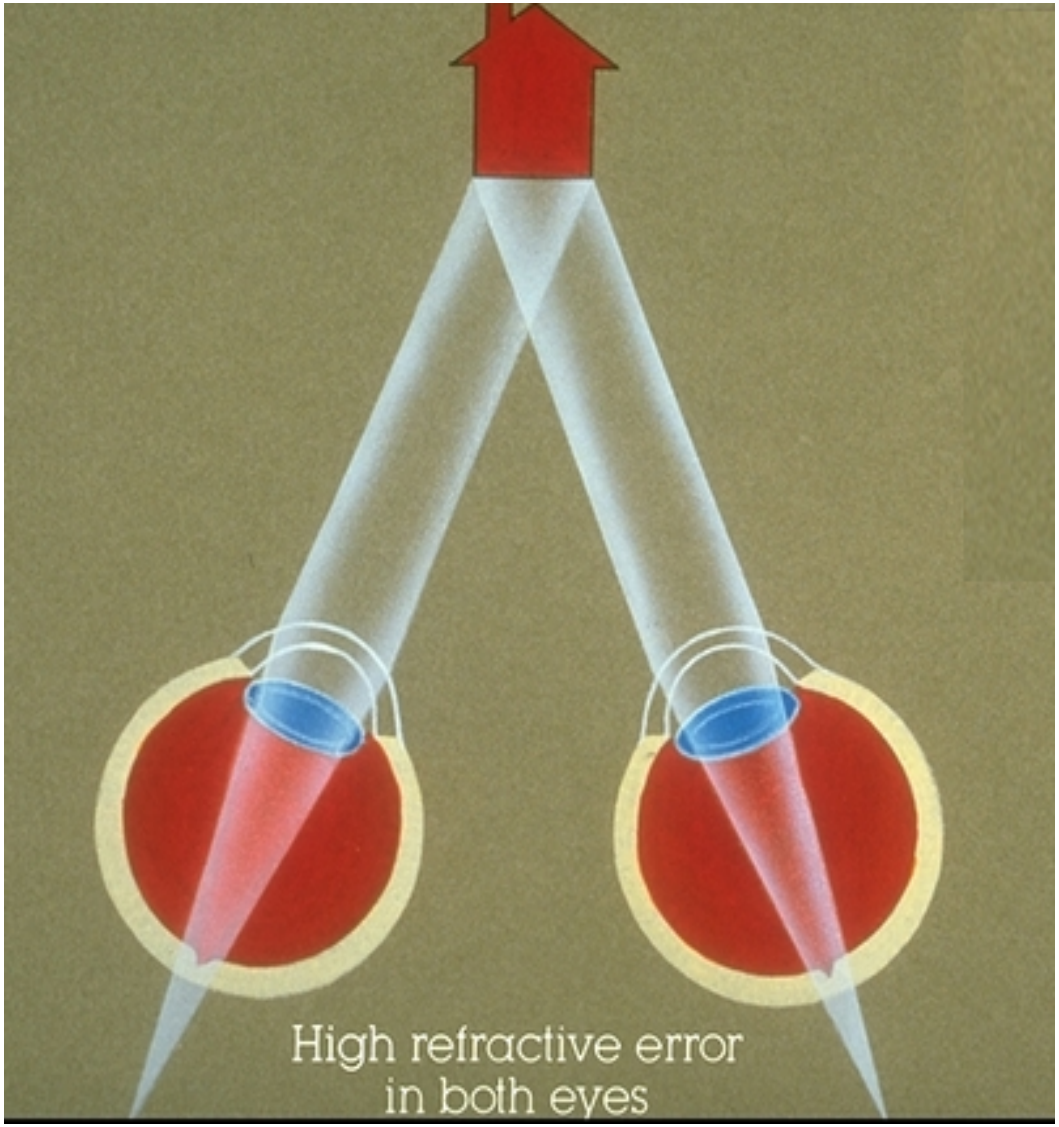
- Poor clarity (media opacities) or blockage of light pathway (ptosis)
- Poor focus (refractive error)
- Poor aim (strabismus)



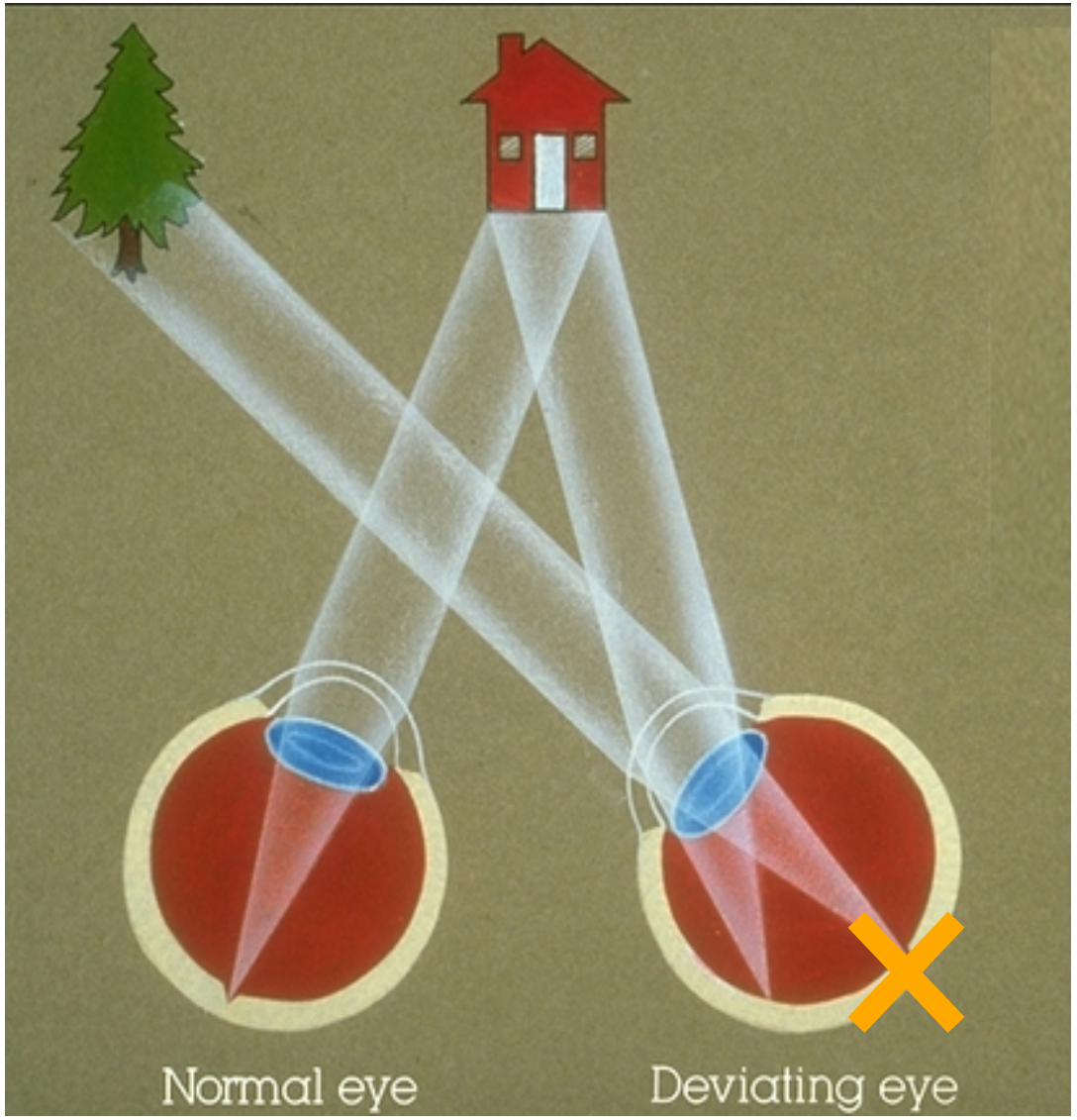
Poor clarity



Poor focus one eye



Poor focus both eyes

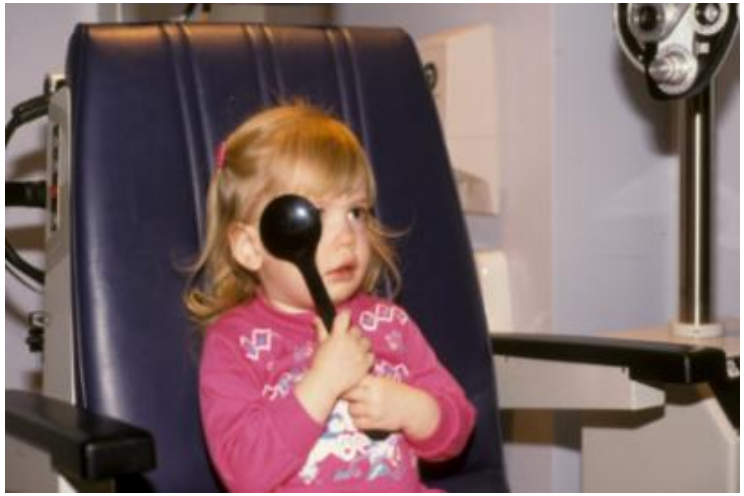


Poor aim: strabismus

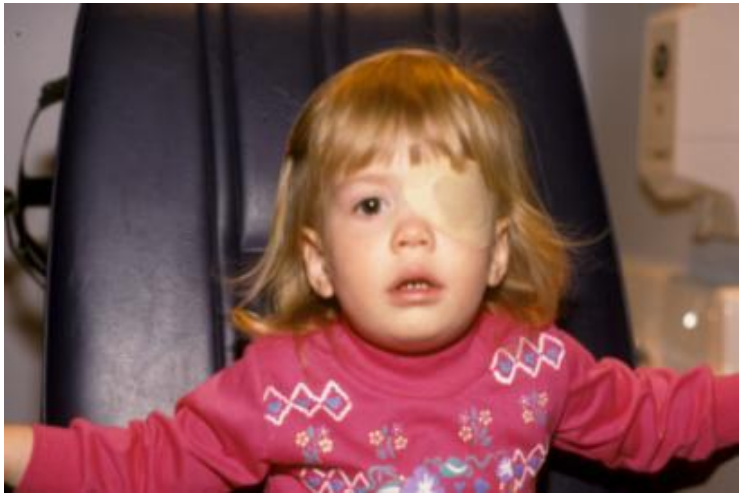
UNILATERAL AMBLYOPIA: PRESENTATION

- Failed vision test
- Strabismus
- Parental concern
- Family history of amblyopia or strabismus

VISION SCREENING AGES 3-5



May peek around occluder



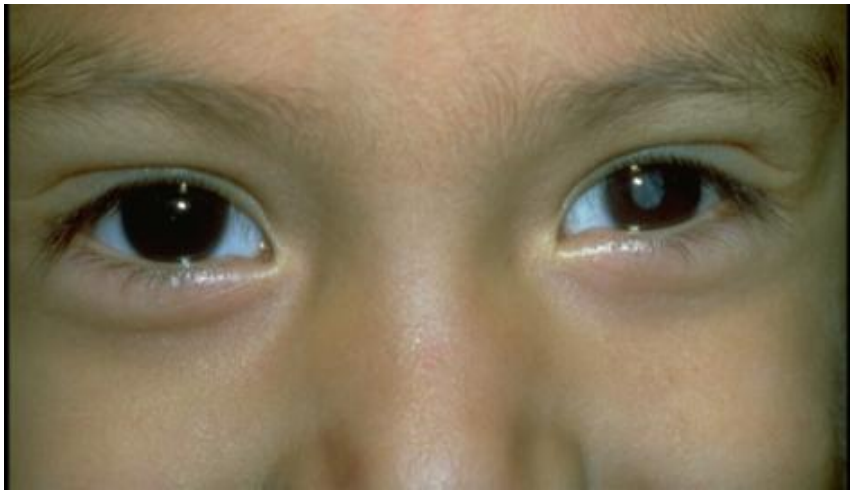
Adhesive patch works best

Strabismus is the most common underlying cause of amblyopia.

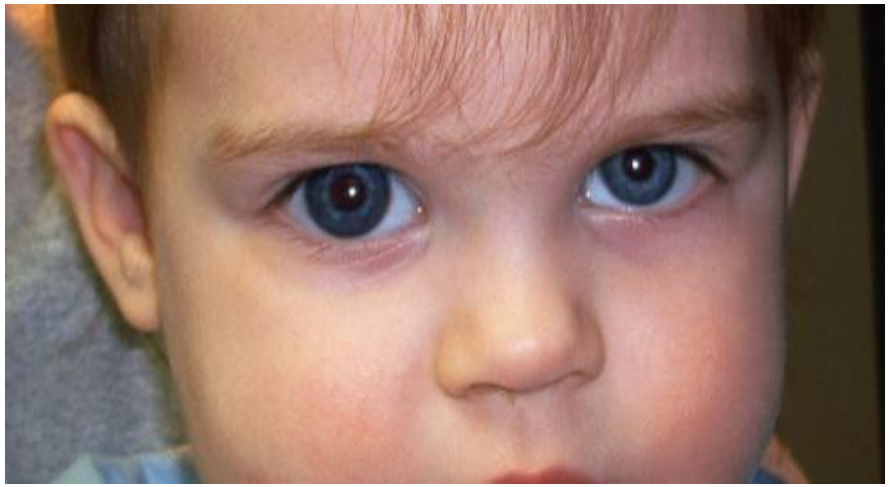
DIPLOPIA IN CHILDREN

- Not a feature of strabismus
- May indicate a serious condition
- Evaluate promptly and refer

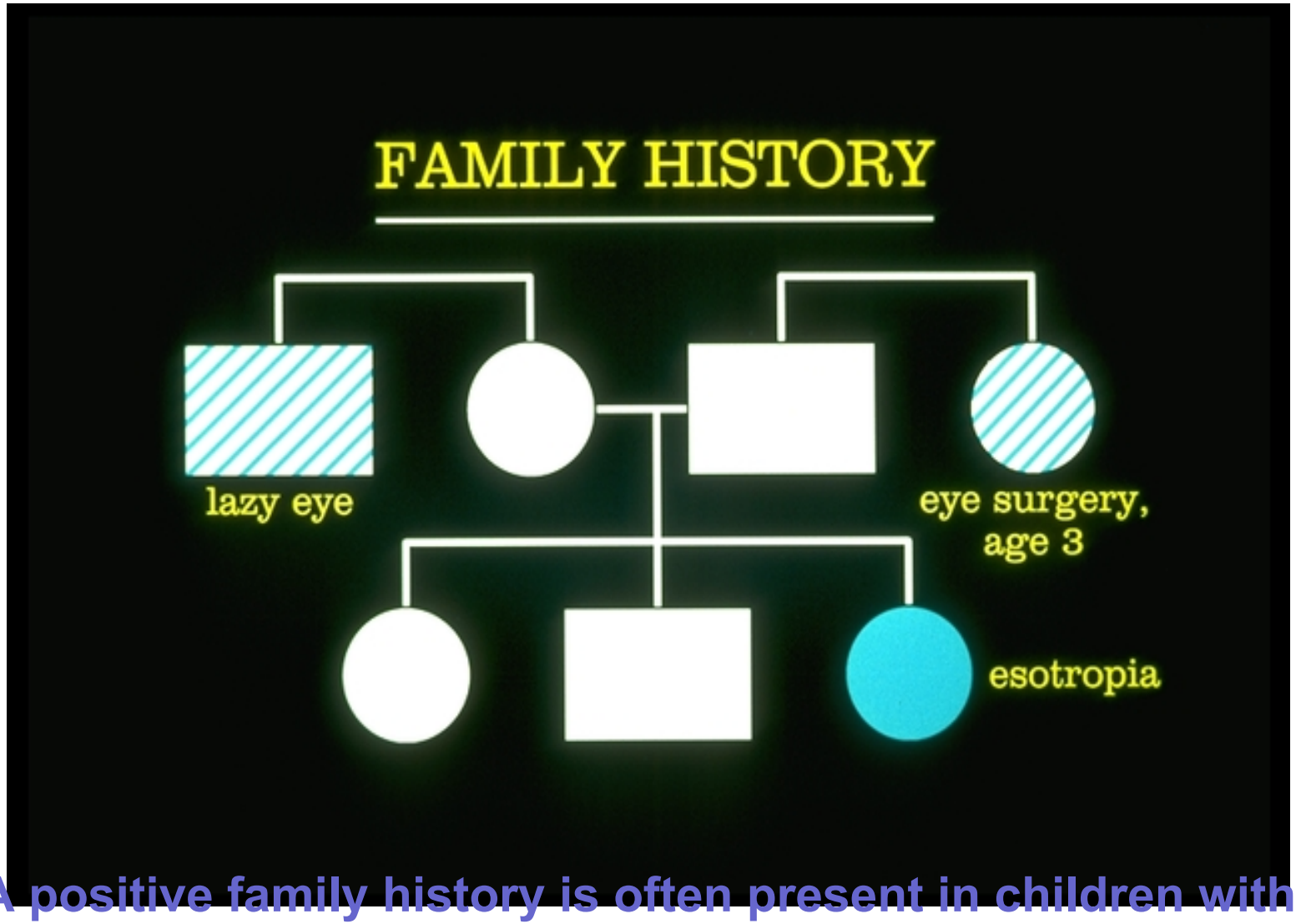
PARENTAL CONCERNS



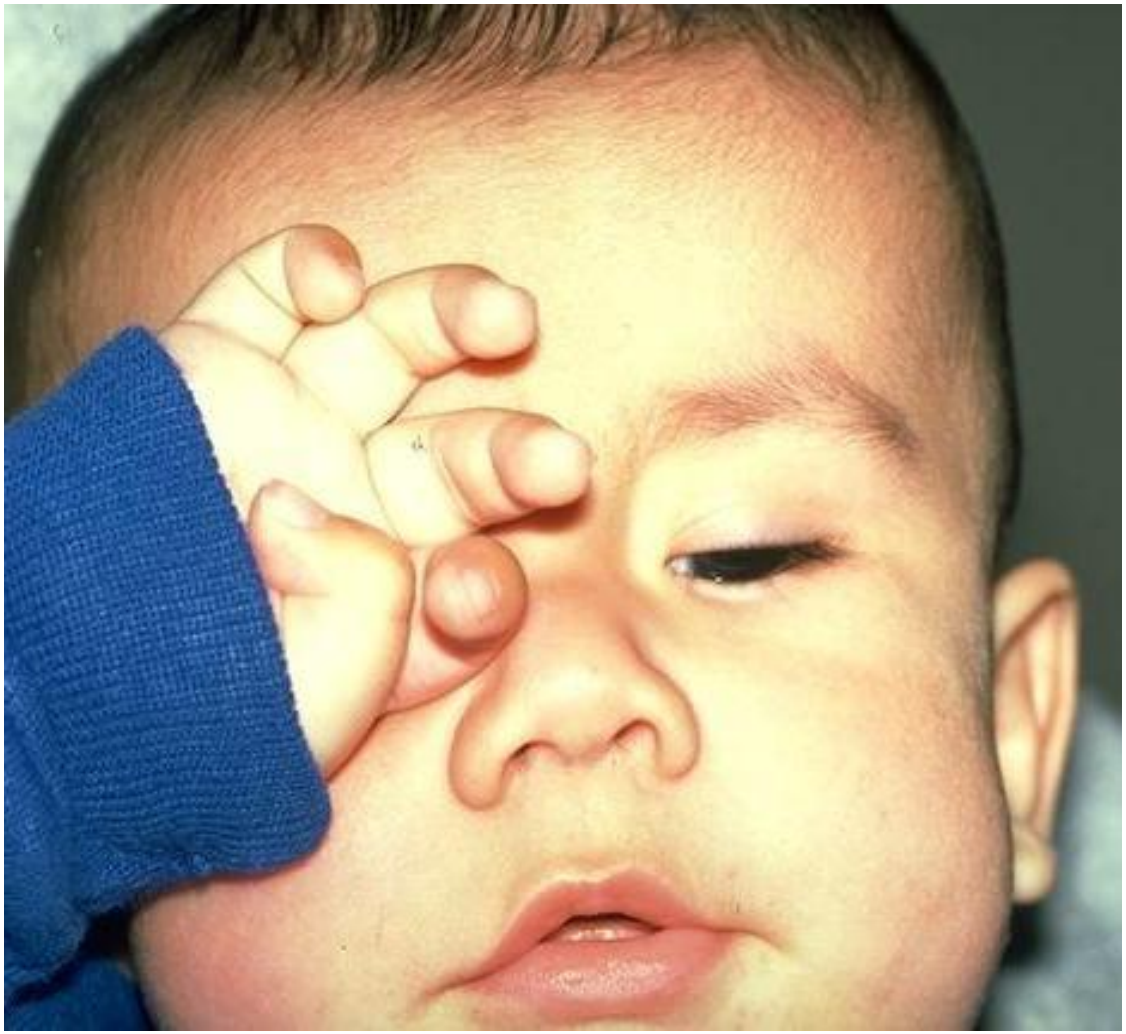
Leukocoria



Enlarged cornea



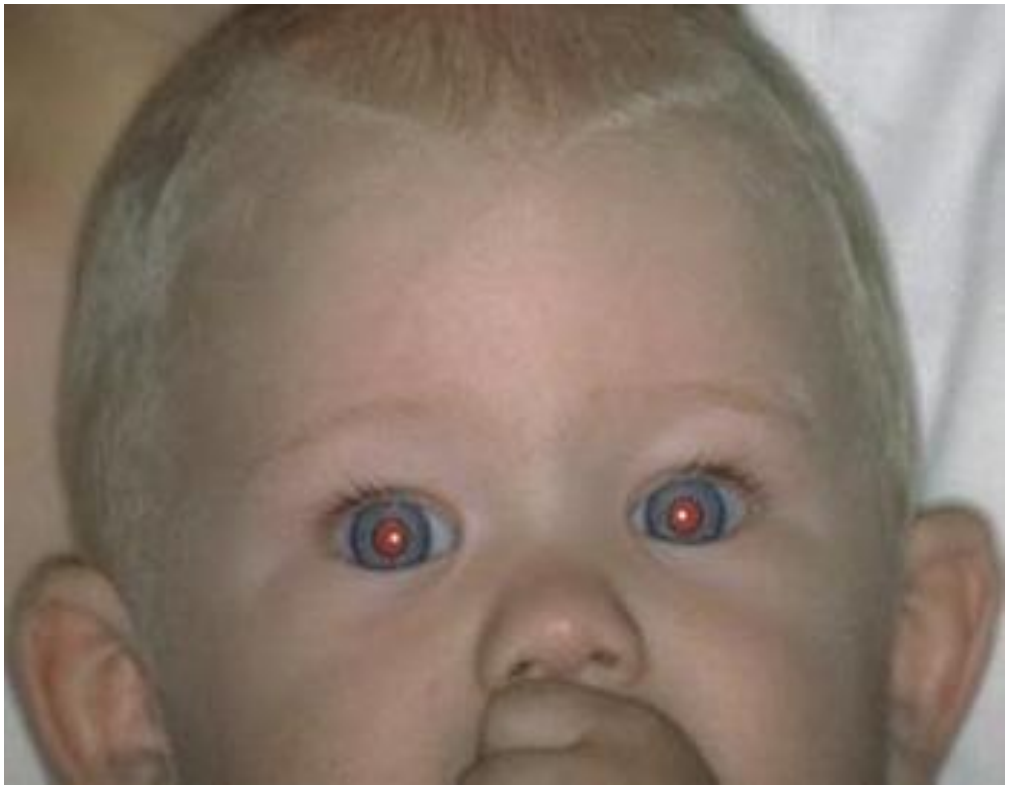
A positive family history is often present in children with amblyopia.



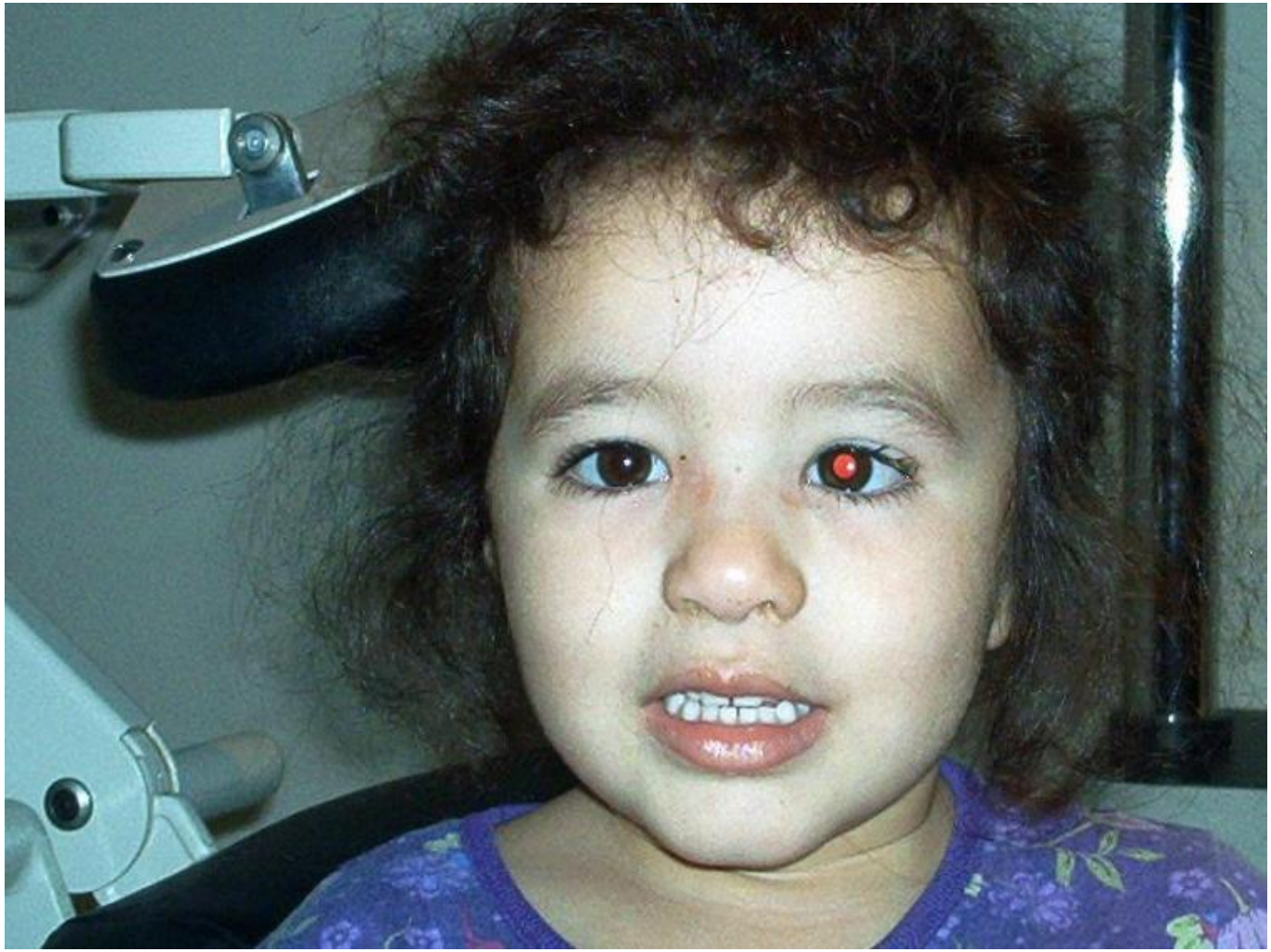
Bilateral amblyopia

AMBLYOPIA: EARLY DETECTION

- Assess red reflex
- Determine visual acuity
- Evaluate ocular alignment



Normal red reflex



Assymetric red reflex

Direct ophthalmoscope

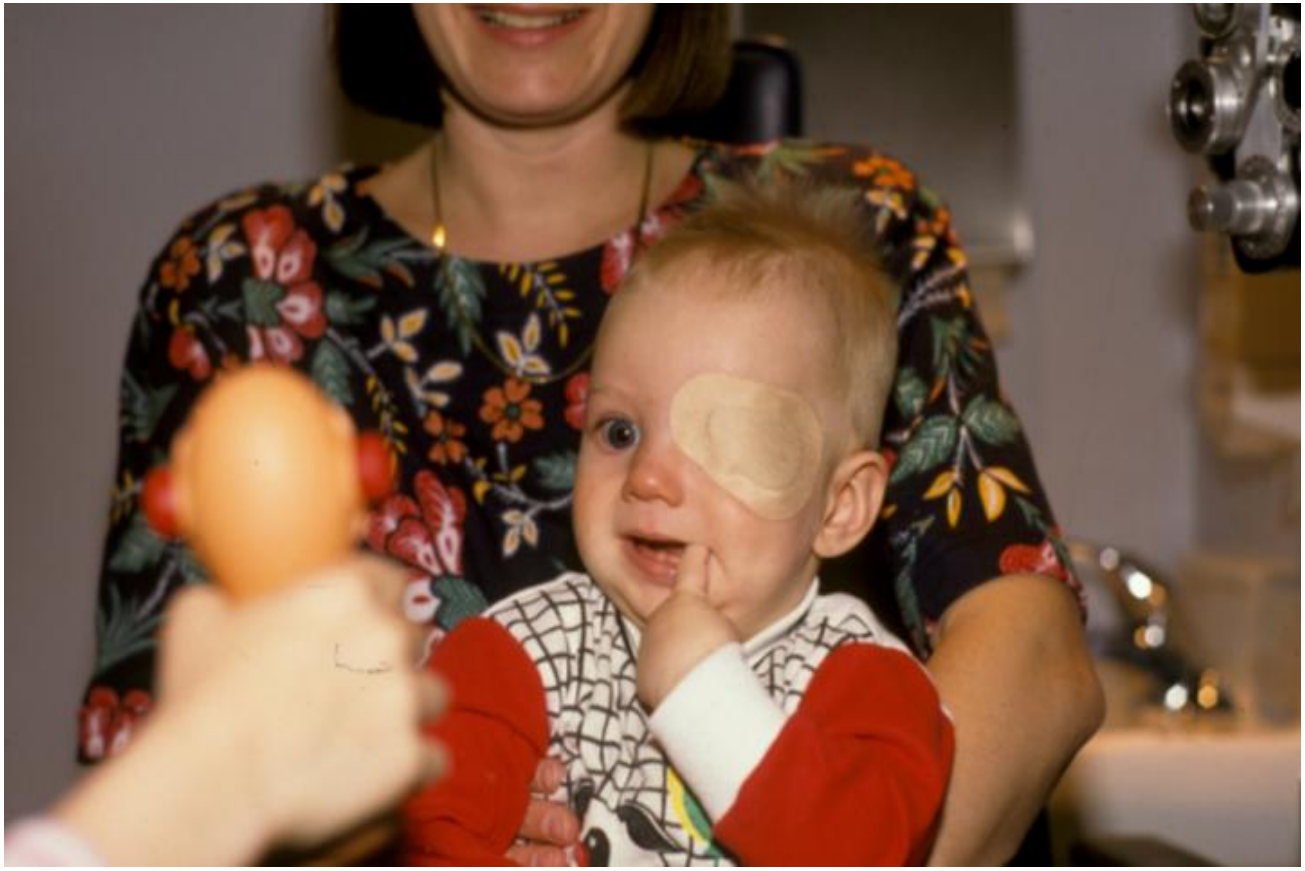
Direct ophthalmoscope: assessing red reflex

Direct ophthalmoscope: examining retina

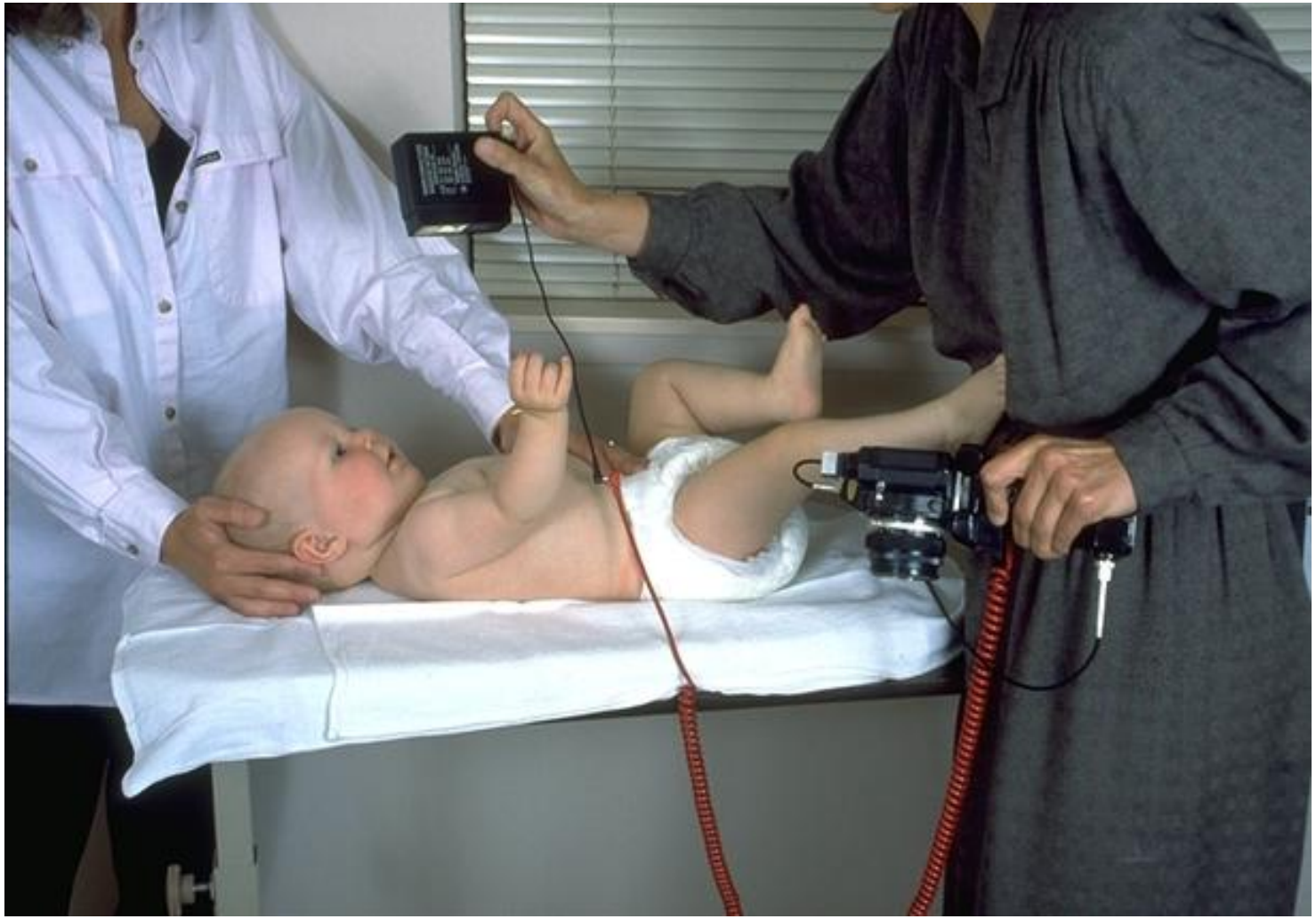
Can your child see?

NORMAL INFANT VISION

- Good visual function
- Fixate and follow with each eye
- Steady fixation



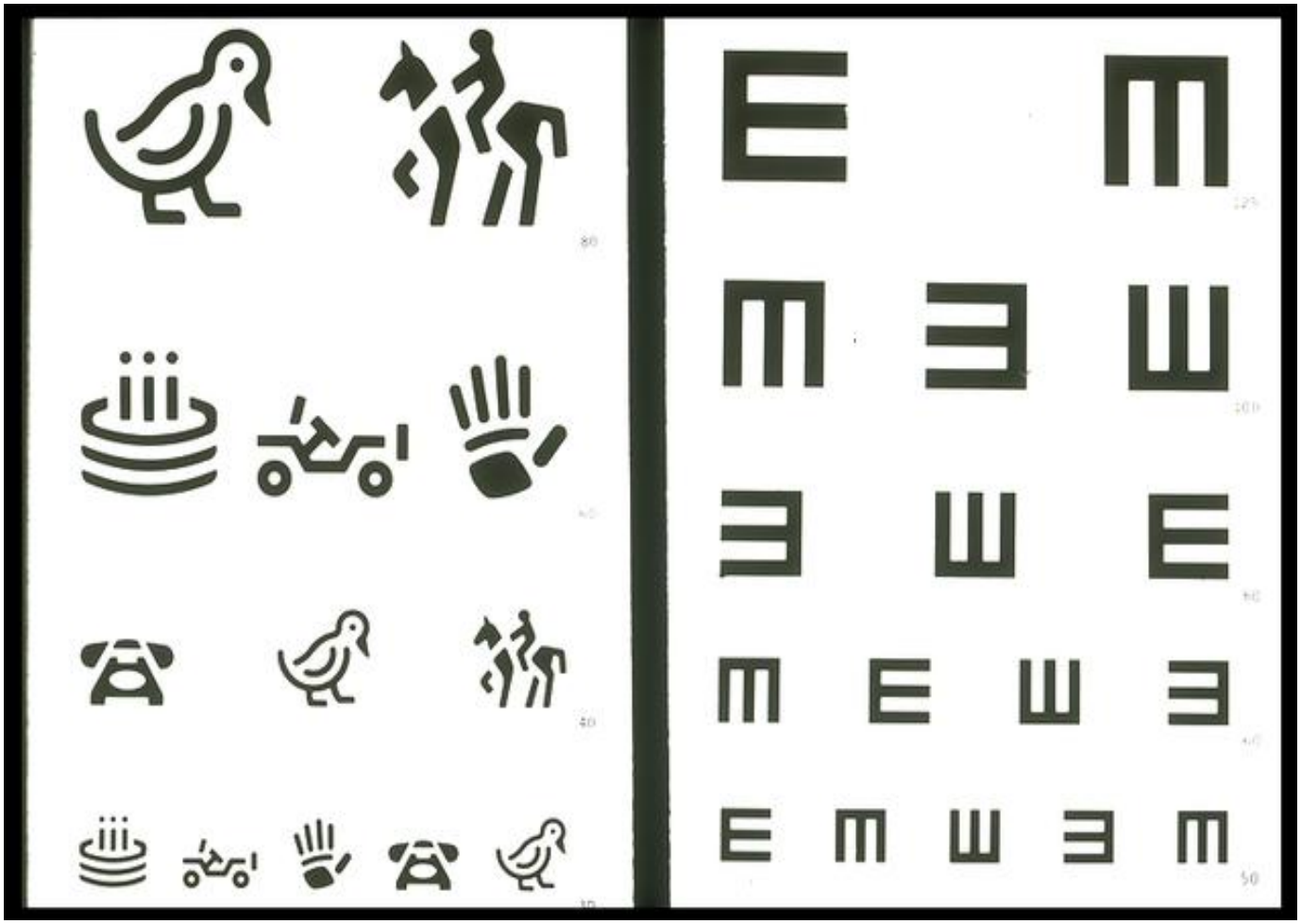
Testing infant vision: Can your child see?



Suspected poor vision: test response to bright light

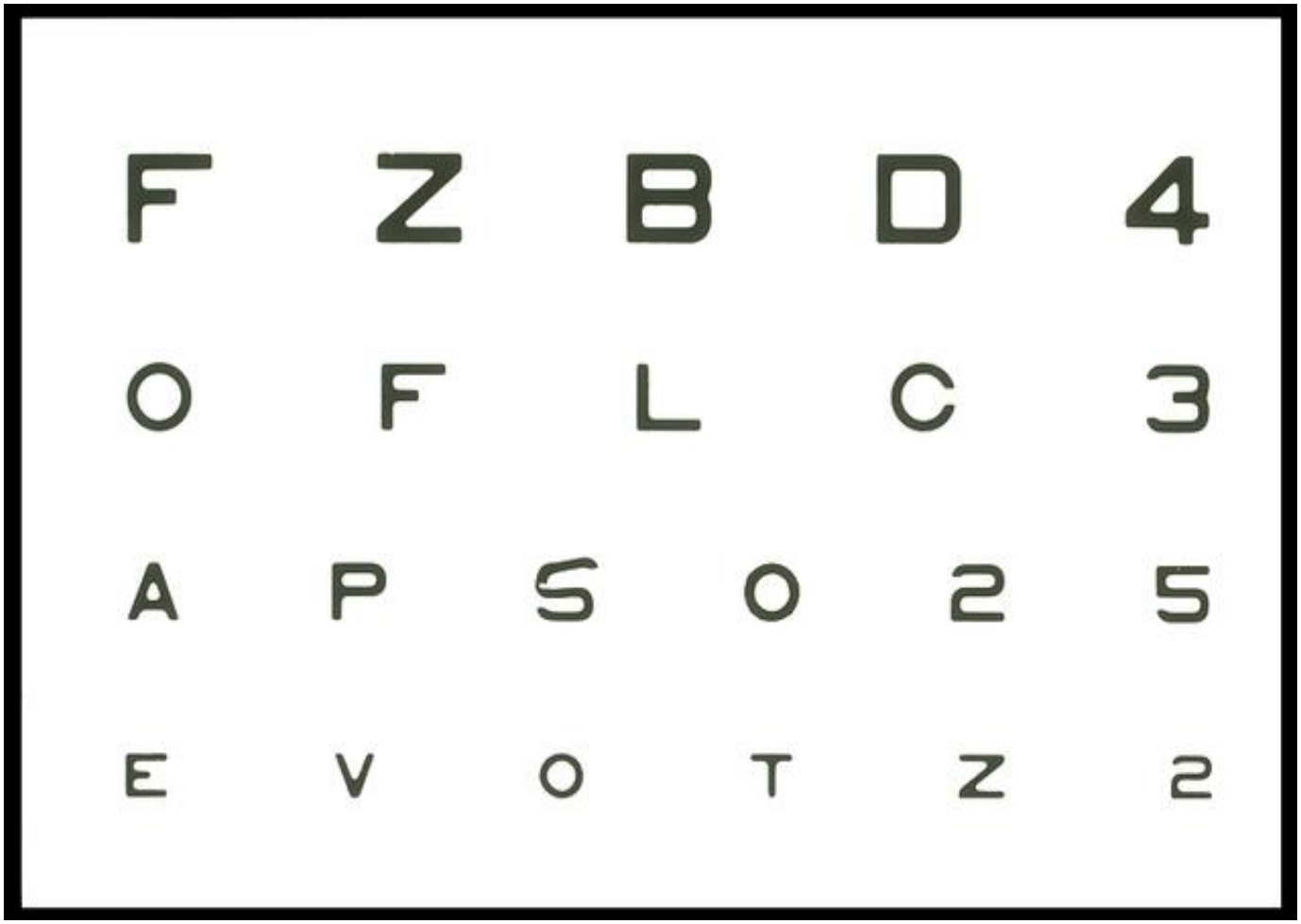
Testing infant vision: Preferential looking test

Measuring visual acuity at 18 months to 3 years: picture chart



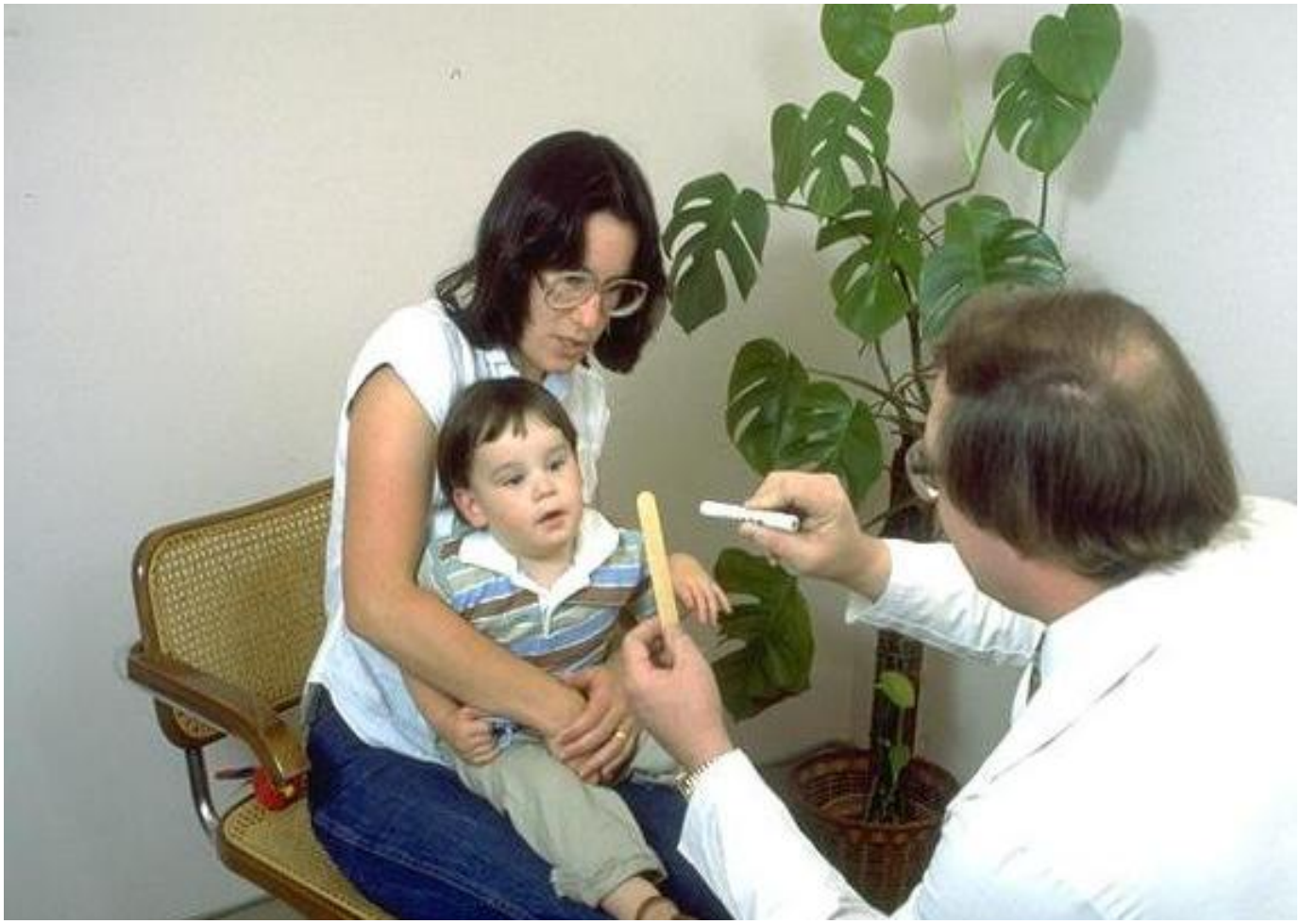
Picture chart

Single E chart



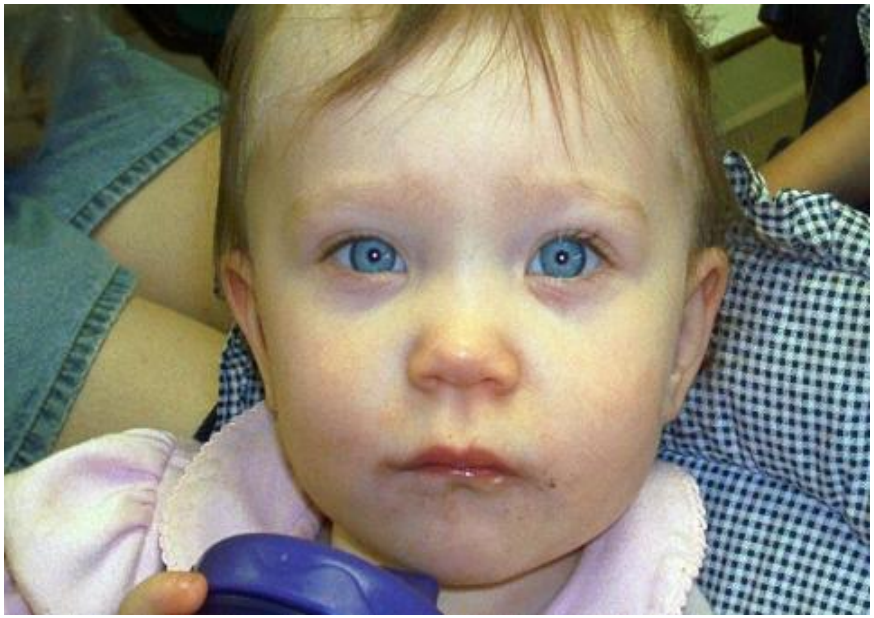
Snellen acuity chart

Depth perception (stereopsis) testing

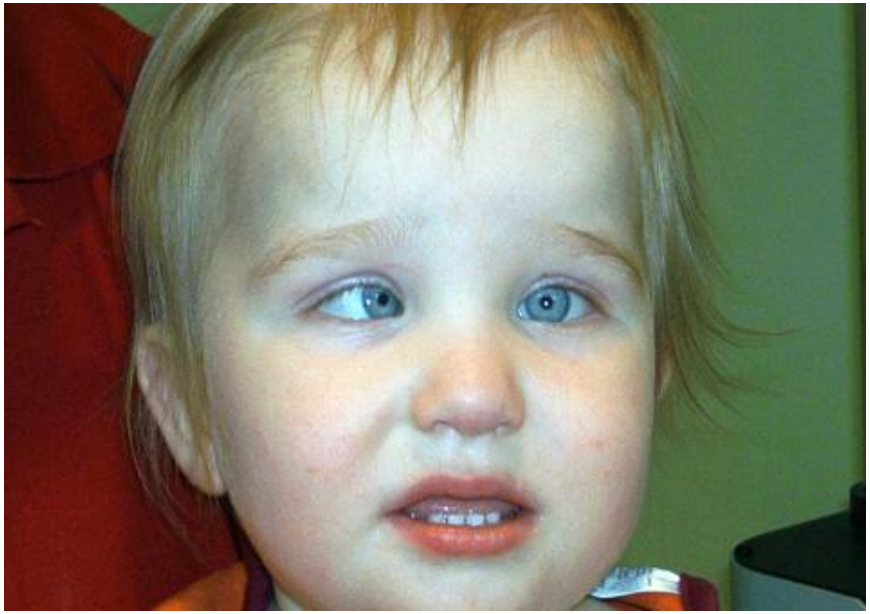


Testing infant vision: Assessing corneal light reflex

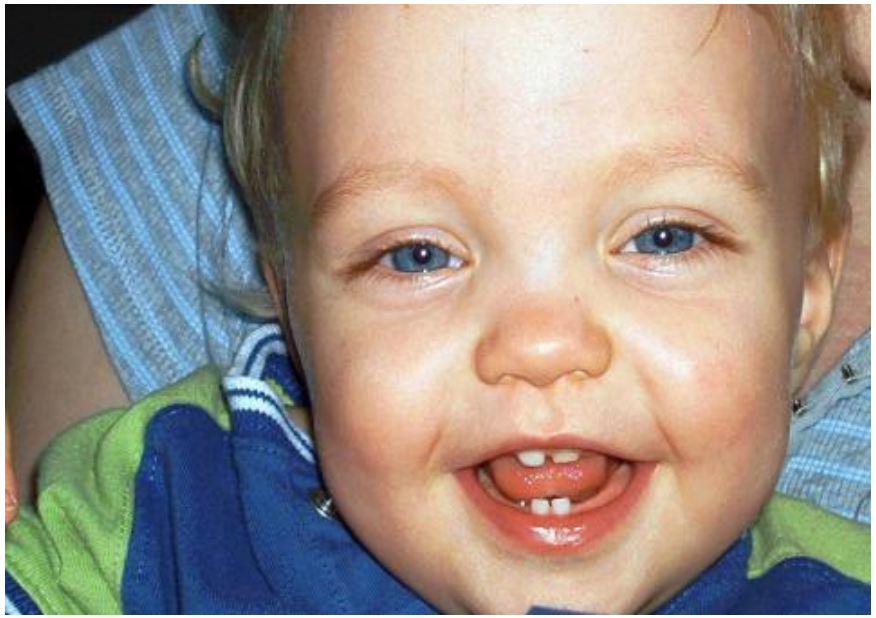
Preventing Amblyopia



Normal



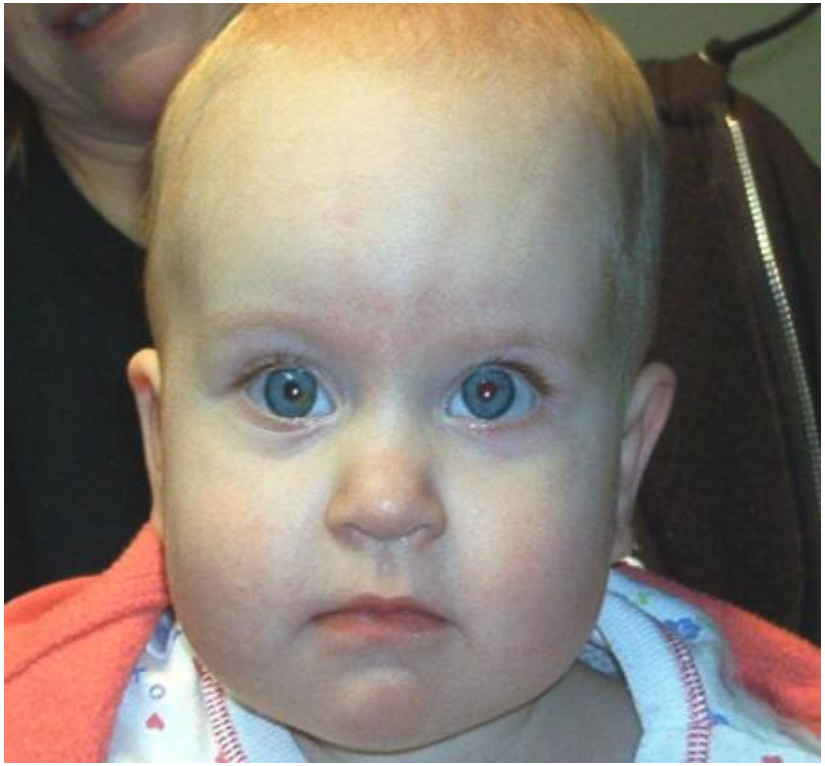
Esotropia



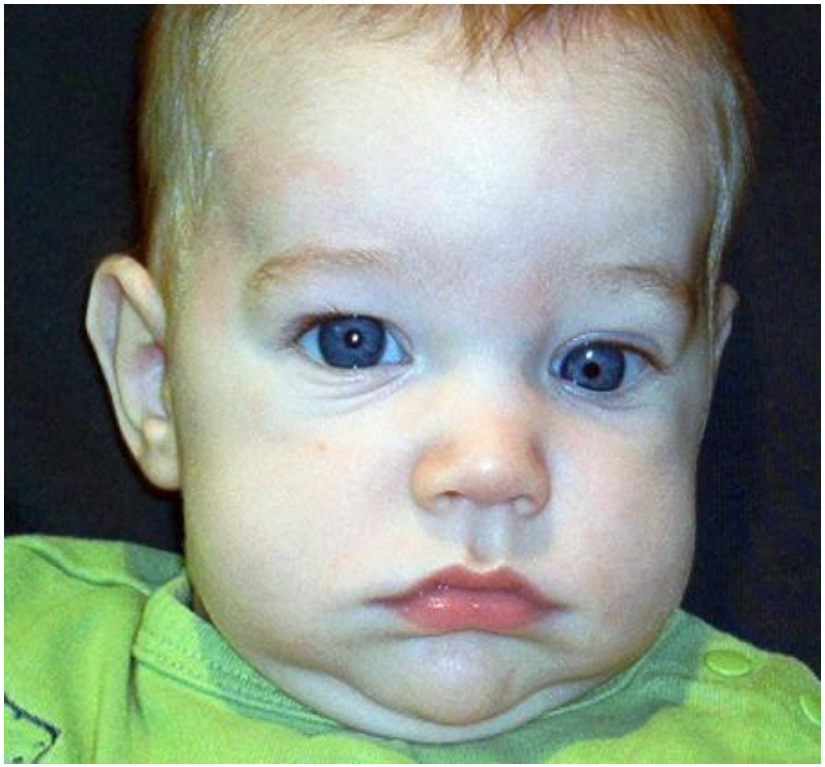
Normal

Exotropia

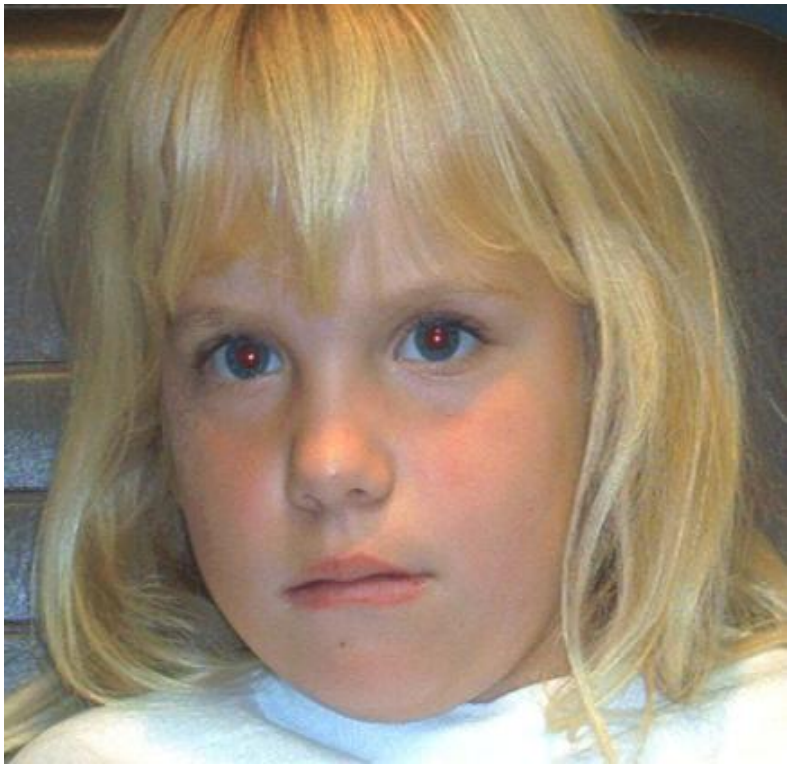
Preventing Amblyopia



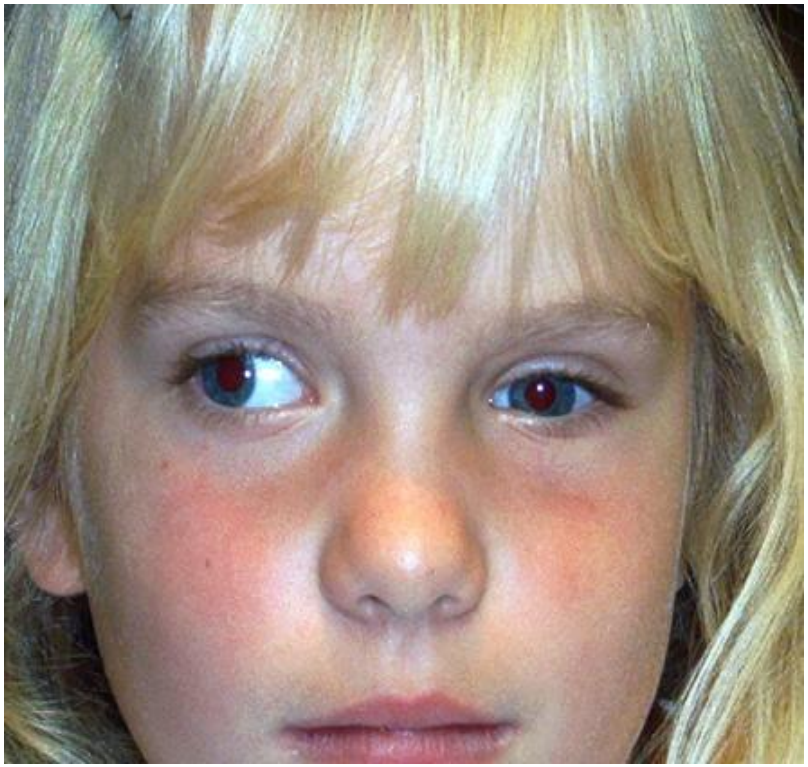
Hypertropia



Hypotropia



Eyes appear aligned with head tilt and turn.



Misalignment revealed when head is straightened.

REFERRAL: IMMEDIATE

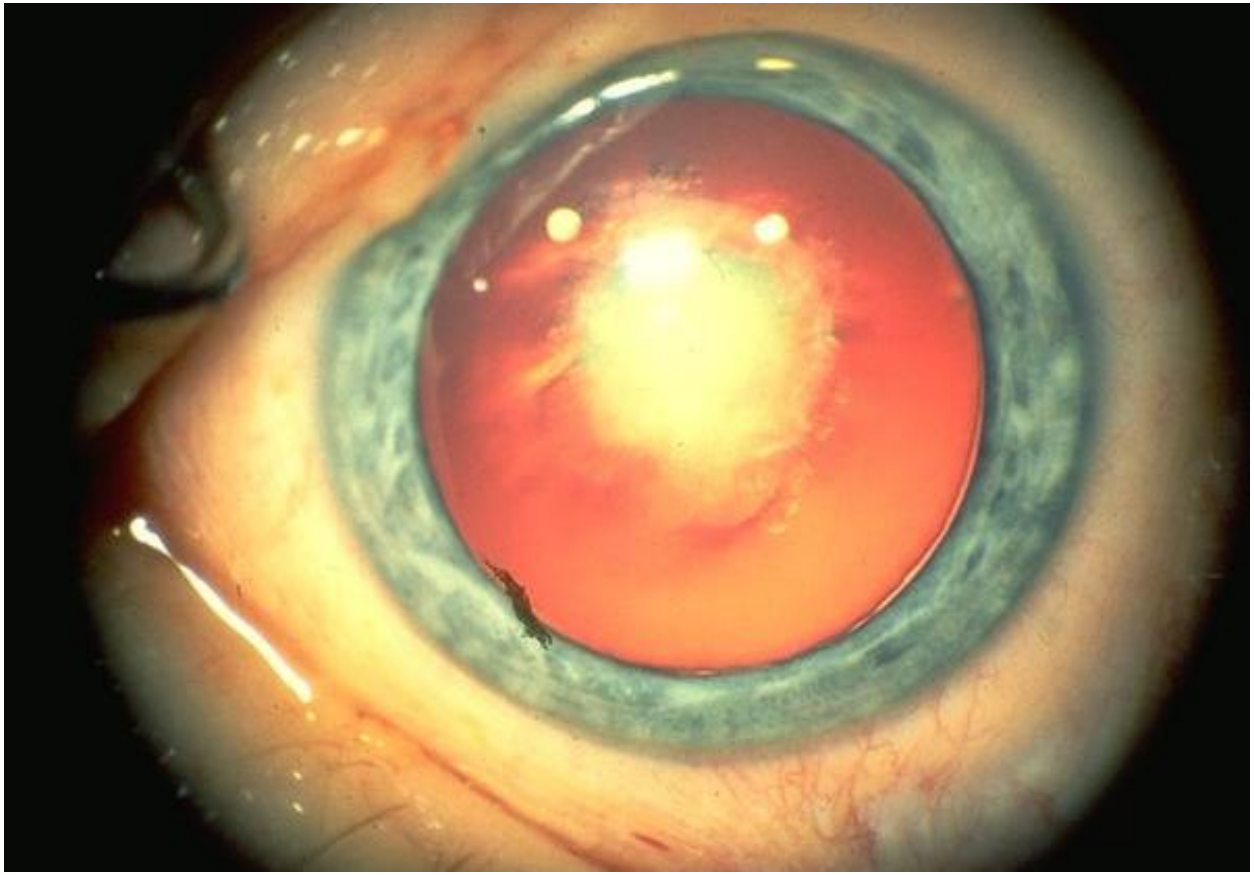
- Poor red reflex in one or both eyes
- Concern about visual function by parent or doctor
- Asymmetric or diminishing visual acuity
- Constant or acute-onset strabismus

REFERRAL: LESS EMERGENT

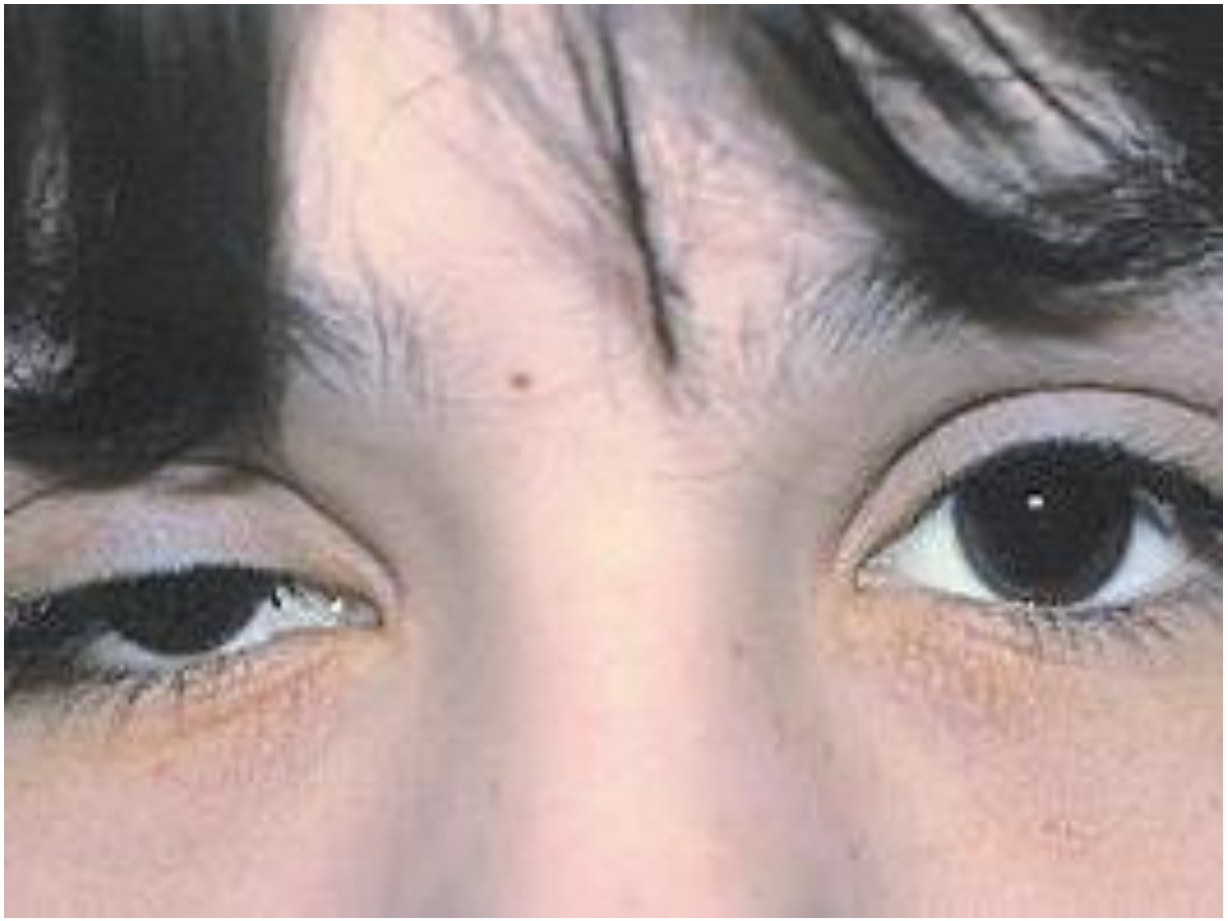
- Intermittent strabismus on examination
- Persistent parental concern
- Associated syndromes or systemic disease
- Reduced visual acuity in one or both eyes

AMBLYOPIA: TREATMENT RATIONALE

- Clearing the media
- Focusing the image
- Initiating amblyopia therapy



Congenital cataracts



Congenital ptosis

Preventing Amblyopia

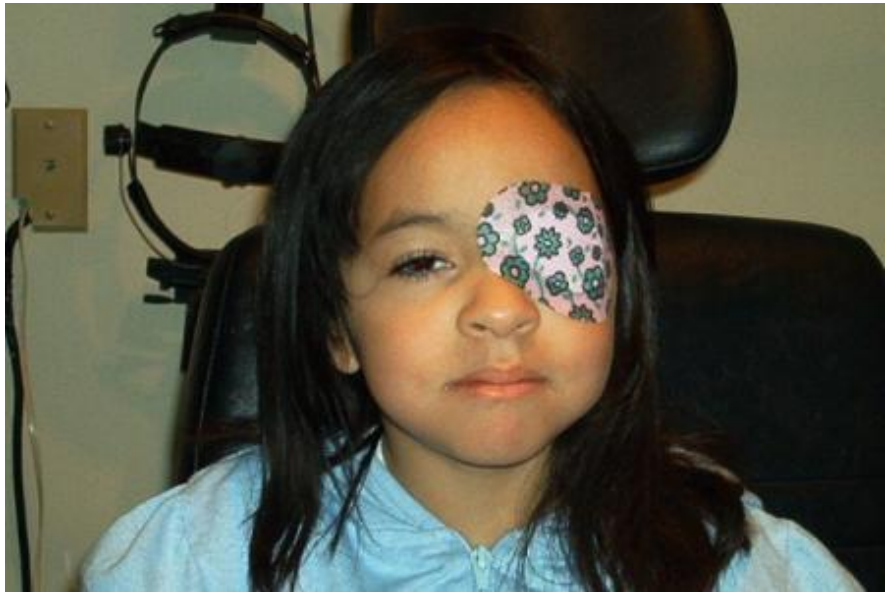
Ophthalmologists can quantify refractive error in infants.

Children usually do well with eyeglasses.

- **Carefully supervise children wearing therapeutic contact lenses.**
- **Retain a pair of backup eyeglasses.**

OCCLUSION THERAPY: PURPOSE

- Improves visual acuity
- Does not eliminate strabismus

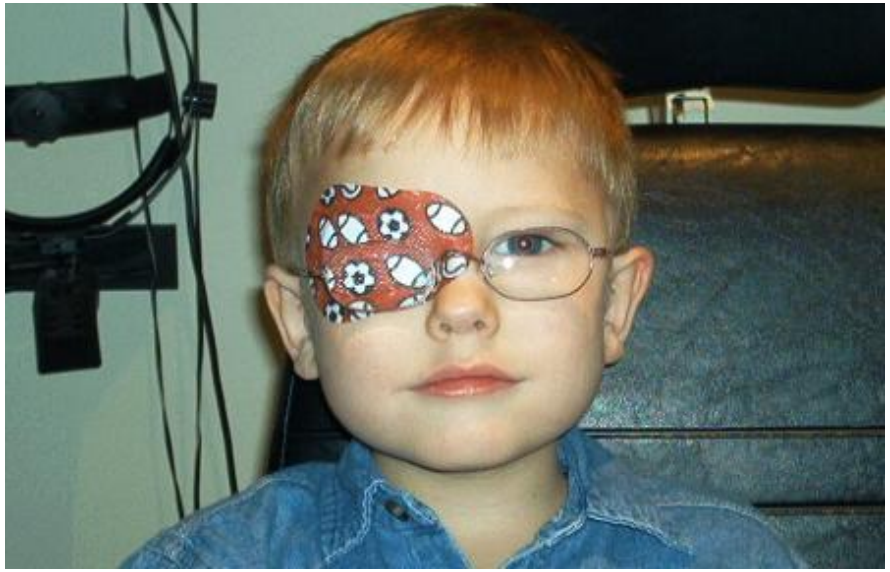


OCCLUSION THERAPY: PRECAUTIONS 1

- Monitor visual acuity carefully at close intervals
- Ensure vision is not being reduced in non-patched eye (“occlusion amblyopia”)

OCCLUSION THERAPY: PRECAUTIONS 2

- Part-time occlusion may suffice
- Ensure parents understand purpose of patching and importance of compliance
- Follow child's visual status into the teen years



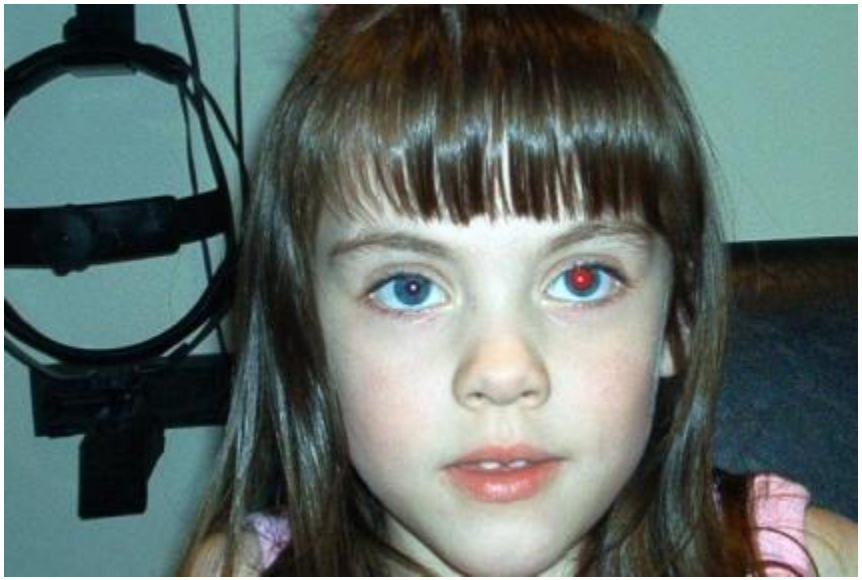
Skin irritation from patching can be avoided.

ATROPINE PENALIZATION THERAPY

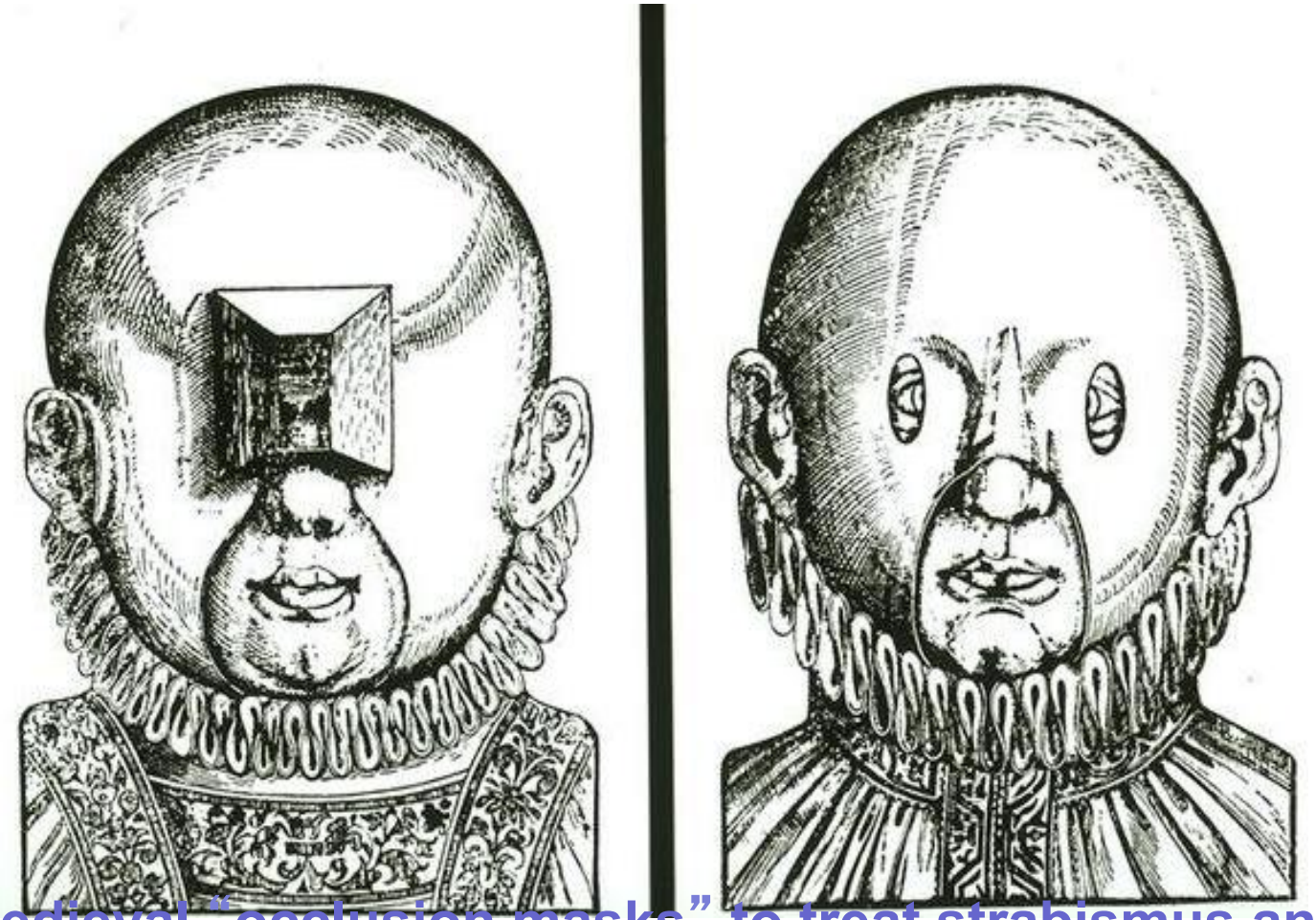
- Atropine ointment or drops in non-amblyopic eye at prescribed levels
- Atropinized eye cannot accommodate for near vision
- Child can still use better-seeing eye for distance
- Child switches fixation at near to amblyopic eye

ATROPINE THERAPY: PRECAUTIONS

- Monitor VA carefully.
- Ensure near VA in amblyopic eye can support near tasks
- Allergic reactions are rare (<1%)
- Systemic side effects are uncommon and minimal



Warn parents that one eye will have a "fixed and dilated pupil."



Medieval "occlusion masks" to treat strabismus and amblyopia

AMBLYOPIA: PREDISPOSING FACTORS

- Poor clarity of ocular media or light blockage
- Poor focus
- Poor aim

AMBLYOPIA DETECTION

- Assess red reflex
- Determine visual acuity
- Evaluate ocular alignment

AMBLYOPIA TREATMENT

- Clearing the ocular media
- Focusing the image
- Amblyopia therapy
- Success requires communication among parents, PCP, and ophthalmologist