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
Understanding Amblyopia

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)
Preventing Amblyopia

Poor clarity
Preventing Amblyopia

Poor focus one eye
Preventing Amblyopia

Poor focus both eyes
Preventing Amblyopia

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
Preventing Amblyopia

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.
Preventing Amblyopia

Bilateral amblyopia
AMBLYOPIA: EARLY DETECTION

- Assess red reflex
- Determine visual acuity
- Evaluate ocular alignment
Normal red reflex
Preventing Amblyopia

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
Preventing Amblyopia

Picture chart

Single E chart
Preventing Amblyopia

Snellen acuity chart
Depth perception (stereopsis) testing
Testing infant vision: Assessing corneal light reflex
Preventing Amblyopia

Normal

Esotropia
Preventing Amblyopia

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
Preventing Amblyopia

Congenital cataracts
Preventing Amblyopia

Congenital ptosis
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
AMBLYOPHIA: 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