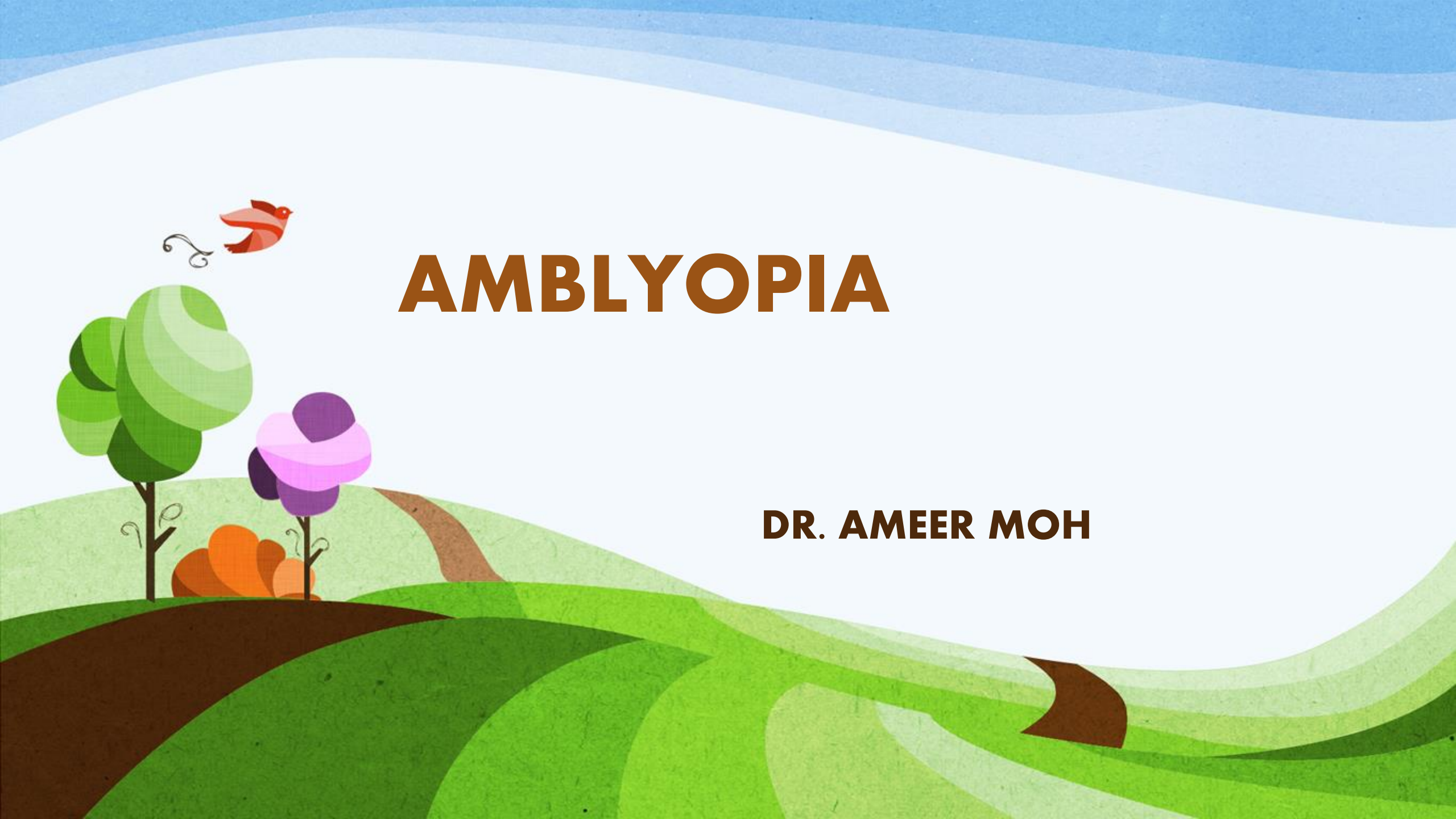


AMBLYOPIA

DR. AMEER MOH

INTRODUCTION

Amblyopia refers to the partial loss of vision in one eye Or both eyes,in the absence of any organic disease of ocular media,retina or visual pathway.

Types of Amblyopia

• **Strabismic** amblyopia results from abnormal binocular interaction where there is continued monocular suppression of the deviating eye.
• **Anisometropic** amblyopia is caused by a difference in refractive error between the eyes and may result from a difference of as little as 1 dioptre. The more ametropic eye receives a blurred image, in a mild form of visual deprivation. It is frequently associated with microstrabismus and may co-exist with strabismic amblyopia.
• **Stimulus deprivation** amblyopia results from vision deprivation. It may be unilateral or bilateral and is typically caused by opacities in the media (e.g. cataract:) or ptosis that covers the pupil.
• **Bilateral ametropic** amblyopia results from high symmetrical refractive errors, usually hypermetropia.
• **Meridional** amblyopia results from image blur in one meridian. It can be unilateral or bilateral and is caused by uncorrected astigmatism (usually >1 D) persisting beyond the period of emmetropization in early childhood.

Clinical features

SIGNS

Anisometropic amblyopia reveals Anisometropia during cycloplegic retinoscopy.

Sstrabismic amblyopia shows a constant or intermittent ocular deviation.

Crowding phenomenon can be seen.

Severe cases has mild RAPD

SYMPTOMS

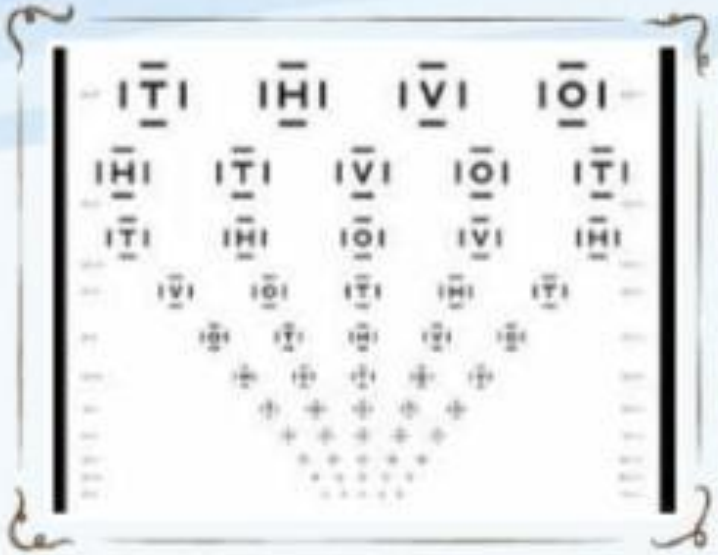
Usually Asymptomatic

One eye is blurry or discomfort in affected eye.

Torticollis occurs infrequently.

Clumsiness can be noted.


Contracted Muscle




cular Deviations

Diagnosis

In the absence of an organic lesion, a difference in best corrected VA of two Snellen lines or more (or >1 log unit) is indicative of amblyopia.

VA in amblyopia is usually better when reading single letters than letters in a row. This 'crowding' phenomenon occurs to a certain extent in normal individuals but is more marked in amblyopes and must be taken into account when testing preverbal children.

History

- The history taking process should include any family history of vision problems (specifically amblyopia and strabismus).
- Parents should be asked if the child was premature.
- Any prior testing (ex. School or Pediatrician vision screening, neuroimaging etc.) should be noted.
- If any abnormality in the child's visual behavior has been noted.
- Duration is important.

Physical examination

- Acuity testing- age appropriate. Single optotypes (without crowding bar) are not recommended as a good acuity testing technique in amblyopes because this test will tend to underestimate the degree of amblyopia (crowding phenomenon).
- Record the power of any current spectacles.
- Tests of stereopsis and binocular function (ex. Worth 4 dot testing)
- External examination (ptosis)
- Presence of absence of an afferent pupil defect
- Anterior segment examination (looking for any media opacity, or irregularity)
- Funduscopic examination
- Cycloplegic retinoscopy

Refraction through Neutral Density filter

Clinical diagnosis

In cases of bilateral amblyopia, a condition must be present during the critical years of visual development which produces constant, significant visual blur.

Eg: **bilateral cataracts**
bilateral high hypermetropia,
bilateral high astigmatism.

In cases of unilateral amblyopia, the diagnosis requires two components:

First, the patient must have a condition that can cause unilateral amblyopia.
Eg: strabismus, anisometropia, or a deprivational cause (ptosis, cataract, etc.).

Second, the patient must have residual asymmetric acuity

Diagnostic procedure

A normal ophthalmic procedure includes:

- acuity testing,
- cycloplegic refraction and retinoscopy,
- tests of stereopsis and binocular vision,
- evaluation of pupillary responses,
- anterior segment examination,
- cover-uncover and alternate-cover testing,
- dilated funduscopic examination

treatment

- The key to optimal treatment of amblyopia is early detection and intervention.
- In symmetric bilateral cases, treatment consists of addressing the etiology of the diminished vision.
- Often there is residual bilateral amblyopia which may improve over time.
- In unilateral cases, active treatment with
  patching,
  pharmacologic agents

1-OPTICAL CORRECTION

Treatment of the refractive errors is probably the first line of management for amblyopia

2-occlusion (Patching of the sound eye) to improve the acuity of the amblyopic eye is the most commonly used technique to treat amblyopia.

- Adjust for age, acuity, and social factors, but in general, longer episodes (time/ d) and longer treatment (weeks of patching) have been used for older patients and those with worse VA.
- There is some evidence that there is little excess benefit in patching for >4h/ d, and this is used as an upper limit in some centres.
- A relative (not absolute) contraindication is nystagmus which may worsen
- during occlusion.

Micropore

Bandage occluder

Spectacle occluder

Contact lens occluder

Patches

Tie-on occluder

Clip-on occluder

Occlusion lens

Occlusion filter

Disadvantages of Occlusiuon-

Occlusion amblyopia
Non compliance
Psychological distress
Appearance of constant deviation
Allergic skin rash
Diplopia
Cosmetically inacceptable

- **Occlusion can be classified into:**
- Type (direct, inverse, alternating)
- Time (full-time, part-time, minimal)
- Occluder (bandage, tie-on, spectacles, contact lenses, pharmacologically induced).
- Patching should be started as soon as Amblyopia is detected
- Full-time occlusion should not be exceed 1 week per year of age
- Patching should be continued till VA reaches and maintains a plateau for 3-6 months
- Maximum patching 6 hours per day(equal to full time patching)
- If no progress is made for 3 consecutive months, patching may be considered a failure
- Regular follow-up to ensure that vision remains stable
- Maintenance patching may be required until 9 years of age when visual system is assumed to have matured

3-penalization

in which vision in the normal eye is blurred with atropine, is an alternative method. It may work best in the treatment of mild–moderate amblyopia (6/24 or better), especially when due to anisometropic hypermetropia. Patch occlusion is likely to produce a quicker response than atropine, which has conventionally been reserved for use when compliance with patch occlusion is poor. It also creates less of a psychosocial problem than patching, especially in the school-going child.

Penalization advantages:

1-being difficult to thwart even if the child objects.

2- It also creates less of a psychosocial problem than patching, especially in the school-going child. Weekend instillation may be adequate.

- ***New technologies***
- Therapies involving video games are characterized by

1-higher compliance,

2-avoiding dissociation and

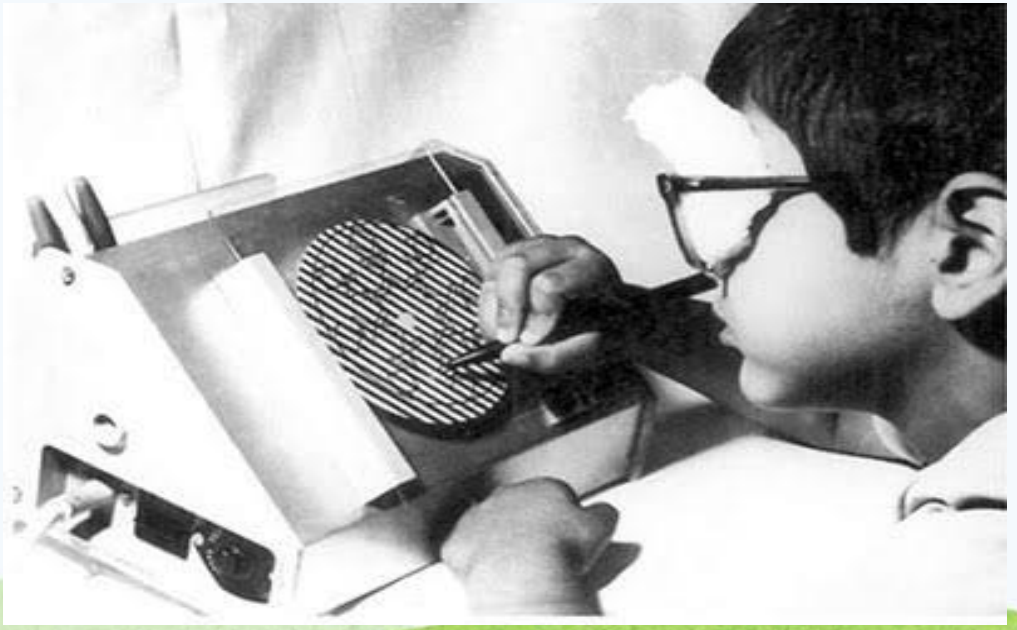
3-optimizing binocularity...They offer promise.

Medical follow up

Followup during treatment is typically somewhere between every 1-3 months. When treatment is discontinued, followup is necessary to ensure there is no regression of effect.

Cam stimulator:

This instrument is designed for the treatment of lazy/amblyopic eye based on. the concept of active and controlled simulation.



Pleoptics:

Pleoptic training is system of treating amblyopia (lazy eye) by retraining visual habits using guided exercises. These eye training exercises are intended to improve eye movements and/or visual tracking.

Surgery

- Amblyopia itself is not a surgical condition, but there are times when surgery may treat the underlying cause of the amblyopia.
- Refractive surgery may be used to correct anisometropia.
- Eye muscle surgery can correct

Strabismus.

Ptosis.

Corneal surgery

may alleviate causes of deprivation (high hyperopia)


THANK YOU