

Care of the Patient with Amblyopia



American Optometric Association

A. DESCRIPTION AND CLASSIFICATION

Amblyopia is usually a unilateral, or rarely bilateral, reduction in visual acuity, in which the best corrected visual acuity is poorer than 20/20 in the absence of any obvious structural anomalies or ocular disease. The classification of amblyopia is based on the clinical conditions responsible for its development (Table 1). Functional amblyopia, which occurs before 6-8 years of age, is attributable to form deprivation, anisometropia, or strabismus.

1. Form Deprivation Amblyopia

- Caused by a physical obstruction (e.g., congenital or traumatic cataract, corneal opacities, prolonged uncontrolled occlusion therapy)

2. Refractive Amblyopia

- Isoametropic amblyopia is caused by high, but equal, uncorrected refractive error (e.g., astigmatism > 2.50 D; hyperopia > than 5.00 D; myopia > 8.00D)
- Anisometropic amblyopia is caused by unequal, uncorrected refractive error (e.g., astigmatism > 1.50 D; hyperopia > 1.00 D; myopia > than 3.00 D)

3. Strabismic Amblyopia

- Caused by early onset of constant unilateral strabismus

B. RISK FACTORS

- Strabismus
- Significant refractive error
- Physical obstruction along the line of sight
- Prematurity/low birth weight
- Retinopathy of prematurity
- Cerebral palsy
- Mental retardation
- Family history of anisometropia, isoametropia, strabismus, amblyopia, or congenital cataracts
- Maternal smoking, use of drugs, alcohol
- Extraocular muscle surgery for early-onset of esotropia

C. COMMON SIGNS, SYMPTOMS, AND COMPLICATIONS

Amblyopia (e.g., anisometropic or strabismic amblyopia) usually produces few symptoms because the patient typically has good visual acuity in the normal eye. Signs and symptoms may include, but are not limited to:

- Reduced vision in one or both eyes
- Decrease in stereopsis
- Constant unilateral strabismus
- Suppression

NOTE: This [Quick Reference Guide](#) should be used in conjunction with the [Optometric Clinical Practice Guideline on Care of the Patient with Amblyopia](#) (Reviewed 2004). It provides summary information and is not intended to stand alone in assisting the clinician in making patient care decisions.

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- Eccentric fixation
- Visual perceptual skills deficit
- Early learning problems

Complications of untreated amblyopia may include, but are not limited to:

- Progressive reduction of visual acuity
- Poor vision development
- Increased risk for loss of vision in better eye
- Later onset of strabismus

D. EARLY DETECTION AND PREVENTION

Amblyopia is preventable and/or treatable, especially if detected and treated early. Methods for early detection and prevention may include, but are not limited to:

- Screening for causes of form deprivation amblyopia by 4-6 weeks of age
- Monitoring at-risk children yearly (birth to 6-8 years of age)
- Screening children with positive family history of strabismus or amblyopia
- Educating parents to the prevalence of and risk for the development of amblyopia

E. EVALUATION

The evaluation of patients with signs and symptoms suggestive of amblyopia or patients diagnosed with amblyopia may include, but is not limited to, the following areas:

1. Patient History

- Presenting problem/chief complaint
- Visual/ocular/general health history
- Developmental/family history

2. Ocular Examination

- Visual acuity (age specific testing)
- Refraction (noncycloplegic and cycloplegic)
- Monocular fixation
- Ocular motor deviation

- Sensorimotor fusion
- Accommodative amplitude/facility
- Ocular motility
- Ocular health assessment and systemic health screening

3. Supplemental Testing

- Visual evoked potential
- Electroretinogram

F. MANAGEMENT

Table 2 provides an overview of the evaluation and management of patients with amblyopia.

1. Basis for Treatment

Treatment of amblyopia is directed toward four goals:

- Improving vision in the amblyopic eye
- Decreasing the risk of blindness in the fellow eye
- Facilitating fusion and maintaining eye alignment
- Developing normal binocular vision

2. Available Treatment Options

- Optical correction (spectacles and/or contact lenses)
Full correction of the ametropia, especially isoametropic and anisometropic (< 2D) patients who are binocular.
- Occlusion (part-time or full-time)
Enables the amblyopic eye to enhance neural input to the visual cortex and is also important in eliminating eccentric fixation.
- Active vision therapy (office and/or home)
Designed to improve visual performance by the patient's conscious involvement in a sequence of specific, controlled visual tasks or procedures that provide feedback about the patient's performance. Vision therapy may be used to remediate deficiencies in eye movements and fixation, spatial perception, accommodative efficiency, and binocular function.

3. Patient Education

- Review examination outcomes and prognosis
- Review treatment options and sequence, estimated treatment time, and risks of no treatment
- Stress importance of protective eye wear
- Encourage compliance with regular followup and monitoring of condition

4. Prognosis and Followup

In general, prognosis is improved if intervention occurs during the period of visual development (birth to 8 years of age), but compliance and motivation for treatment may afford improvements into adulthood. Prognosis for recovery of visual acuity and improvement of monocular deficits depends on the interplay of several factors:

- Patient compliance
- Specific type of amblyopia
- Monocular fixation status
- Age at onset
- Initial visual acuity
- Age of the patient when treatment is initiated
- Type of treatment prescribed

The frequency and composition of followup visits for the various forms of amblyopia are listed in Table 2. The estimated number of total vision therapy visits may vary based on co-existing conditions, patient compliance, etc.

TABLE 1*

Differential Diagnosis of Cases of Reduced Visual Acuity

Functional amblyopia causes:

1. Form deprivation

- Congenital or traumatic cataract
- Early complete blepharoptosis
- Corneal opacity
- Hyphema
- Vitreous hemorrhage
- Uncontrolled occlusion therapy
- Uncontrolled penalization therapy

2. Constant unilateral strabismus

3. Amblyopiogenic uncorrected refractive error

- Anisometropia (spherical or astigmatic)
- Isoametropia

4. Combined aniso-strabismus

Psychogenic causes:

1. Conversion hysteria

2. Malingering

Structural/pathological causes:

1. Achromatopsia

2. Coloboma

3. Myelinated retinal nerve fibers

4. Retinopathy of prematurity

5. Degenerative myopia

6. Hypoplastic optic nerve

7. Keratoconus

8. Opacities of the media

9. Macular, perimacular chorioretinal scar

10. Macular pathology (e.g., Stargardt's disease)

11. Optic atrophy

12. Retrobulbar neuritis

13. Nystagmus (congenital, latent, manifest latent)

14. Craniopharyngioma

*Adapted from Table 1 in the Optometric Clinical Practice Guideline on Care of the Patient with Amblyopia

TABLE 2*

Differential Diagnosis of Cases of Reduced Visual Acuity

Type of Patient	Frequency of Evaluations/First Year	Composition of Followup Evaluations				Management Plan
		Visual Acuity	Refraction	Monocular Fixation	Binocular Status	
Form Deprivation Amblyopia (Monocular/Binocular)	1. Every 2-4 wks for 1 yr; every 6 mos thereafter	Each visit	Each visit	As necessary	Each visit	1. Surgical consultation Optical correction (within 1 wk after surgery) Occlusion (part-time, 2 hrs/day) Visual stimulation
Isometric Refractive Amblyopia	1. Re-evaluate in 4-6 wks; monitor every 4-6 mos 2. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy	Each visit	As necessary	As necessary	Each visit	1. Optical correction only 2. Optical correction Vision therapy (10-15 visits)**
Anisometric Refractive Amblyopia	1. Re-evaluate in 4-6 wks; monitor every 2-6 mos 2. Re-evaluate in 4-6 wks; monitor 2-4 wks 3. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy	Each visit	As necessary	As necessary	Each visit	1. Optical correction only 2. Optical correction Occlusion (part-time, 2-5 hrs/day) 3. Optical correction Occlusion (part-time, 2-5 hrs/day) Vision therapy (15-25 visits)** Re-evaluate & treat residual binocular anomalies when VA is 20/40-20/60
Strabismic Amblyopia (Central Fixation)	1. Re-evaluate in 4-6 wks; monitor every 2-4 wks 2. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy	Each visit	As necessary	As necessary	Each visit	1. Optical correction Occlusion (full-time if constant; part-time if intermittent) 2. Optical correction Occlusion (full-time if constant; part-time if intermittent) Vision therapy (15-25 visits)** Re-evaluate & treat residual binocular anomalies when VA is 20/40-20/60
Strabismic Amblyopia (Eccentric Fixation)	1. Re-evaluate in 4-6 wks; monitor every 2-4 wks 2. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy	Each visit	As necessary	Each visit	Each visit	1. Optical correction Occlusion (full-time if constant; part-time if intermittent) 2. Optical correction Occlusion (full-time if constant; part-time if intermittent) Vision therapy (25-35 visits)** Re-evaluate & treat residual binocular anomalies when VA is 20/40-20/60

* Adapted from Figure 3 in the Optical Clinical Practice Guideline on Care of the Patient with Amblyopia

** Estimated visits may vary based on co-existing conditions, patient compliance, etc.