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

3. Supplemental Testing
   - Visual evoked potential
   - Electrotetinogram

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.

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### Differential Diagnosis of Cases of Reduced Visual Acuity

<table>
<thead>
<tr>
<th>Functional amblyopia causes:</th>
<th>Structural/pathological causes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Form deprivation</td>
<td>1. Achromatopsia</td>
</tr>
<tr>
<td>• Congenital or traumatic cataract</td>
<td>2. Coloboma</td>
</tr>
<tr>
<td>• Early complete blepharoptosis</td>
<td>3. Myelinated retinal nerve fibers</td>
</tr>
<tr>
<td>• Corneal opacity</td>
<td>4. Retinopathy of prematurity</td>
</tr>
<tr>
<td>• Hyphema</td>
<td>5. Degenerative myopia</td>
</tr>
<tr>
<td>• Vitreous hemorrhage</td>
<td>6. Hypoplastic optic nerve</td>
</tr>
<tr>
<td>• Uncontrolled occlusion therapy</td>
<td>7. Keratoconus</td>
</tr>
<tr>
<td>• Uncontrolled penalization therapy</td>
<td>8. Opacities of the media</td>
</tr>
<tr>
<td>2. Constant unilateral strabismus</td>
<td>9. Macular, perimacular chorioretinal scar</td>
</tr>
<tr>
<td>3. Amblyopiogenic uncorrected refractive error</td>
<td>10. Macular pathology (e.g., Stargardt’s disease)</td>
</tr>
<tr>
<td>• Anisometropia (spherical or astigmatic)</td>
<td>11. Optic atrophy</td>
</tr>
<tr>
<td>• Isoametropia</td>
<td>12. Retrobulbar neuritis</td>
</tr>
<tr>
<td>Psychogenic causes:</td>
<td>14. Craniopharyngioma</td>
</tr>
<tr>
<td>1. Conversion hysteria</td>
<td></td>
</tr>
<tr>
<td>2. Malingering</td>
<td></td>
</tr>
</tbody>
</table>

*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**

<table>
<thead>
<tr>
<th>Type of Patient</th>
<th>Frequency of Evaluations/First Year</th>
<th>Visual Acuity</th>
<th>Refraction</th>
<th>Monocular Fixation</th>
<th>Binocular Status</th>
<th>Management Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Deprivation Amblyopia</td>
<td>1. Every 2-4 wks for 1 yr; every 6 mos thereafter</td>
<td>Each visit</td>
<td>Each visit</td>
<td>As necessary</td>
<td>Each visit</td>
<td>1. Surgical consultation <strong>Estimated visits may vary based on co-existing conditions, patient compliance, etc.</strong></td>
</tr>
<tr>
<td>Isometropic Refractive Amblyopia</td>
<td>1. Re-evaluate in 4-6 wks; monitor every 4-6 mos after vision therapy</td>
<td>Each visit</td>
<td>As necessary</td>
<td>As necessary</td>
<td>Each visit</td>
<td>1. Optical correction only</td>
</tr>
<tr>
<td></td>
<td>2. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy</td>
<td>Each visit</td>
<td>As necessary</td>
<td>As necessary</td>
<td>Each visit</td>
<td>2. Optical correction Vision therapy (10-15 visits)**</td>
</tr>
<tr>
<td></td>
<td>3. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy</td>
<td>Each visit</td>
<td>As necessary</td>
<td>As necessary</td>
<td>Each visit</td>
<td>3. Optical correction Vision therapy (15-25 visits)** Re-evaluate &amp; treat residual binocular anomalies when VA is 20/40-20/60</td>
</tr>
<tr>
<td>Anisometropic Refractive Amblyopia</td>
<td>1. Re-evaluate in 4-6 wks; monitor every 2-4 mos</td>
<td>Each visit</td>
<td>As necessary</td>
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</tr>
<tr>
<td>Strabismic Amblyopia (Central Fixation)</td>
<td>1. Re-evaluate in 4-6 wks; monitor every 2-4 wks</td>
<td>Each visit</td>
<td>As necessary</td>
<td>As necessary</td>
<td>Each visit</td>
<td>1. Optical correction Occlusion (full-time if constant; part-time if intermittent)</td>
</tr>
<tr>
<td></td>
<td>2. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy</td>
<td>Each visit</td>
<td>As necessary</td>
<td>As necessary</td>
<td>Each visit</td>
<td>2. Optical correction Vision therapy (15-25 visits)** Re-evaluate &amp; treat residual binocular anomalies when VA is 20/40-20/60</td>
</tr>
<tr>
<td>Strabismic Amblyopia (Eccentric Fixation)</td>
<td>1. Re-evaluate in 4-6 wks; monitor every 2-4 wks</td>
<td>Each visit</td>
<td>As necessary</td>
<td>Each visit</td>
<td>Each visit</td>
<td>1. Optical correction Occlusion (full-time if constant; part-time if intermittent)</td>
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<td>2. Re-evaluate in 4-6 wks; monitor 2-6 mos after vision therapy</td>
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<td>Each visit</td>
<td>2. Optical correction Vision therapy (25-35 visits)** Re-evaluate &amp; treat residual binocular anomalies when VA is 20/40-20/60</td>
</tr>
</tbody>
</table>

* 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.