



The Amblyopia Treatment Studies

Implications for Clinical Practice

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Keywords

- Amblyopia treatment study • Pediatric Eye Disease Investigator Group
- Amblyopia • Occlusion • Patching • Atropine • Residual amblyopia
- Optical correction

Key points

- The mainstay of amblyopia treatment is optimal refractive correction; significant gains in visual acuity, beyond the immediate gains from simply eliminating optical blur, often occur with continued wear of the optical correction.
- When patching is prescribed, it is reasonable to initially prescribe 2 hours of daily patching for moderate amblyopia and 6 hours of daily patching for severe amblyopia.
- Atropine penalization of the sound eye or full-time wear of a Bangerter filter can be prescribed for first-line amblyopia treatment or for patients who do not comply with patching.
- The upper age limit for amblyopia treatment is not established, albeit there are generally greater gains in visual acuity if treatment occurs before 7 years of age.

INTRODUCTION

Amblyopia is the most common cause of monocular vision loss in children [1], with an estimated prevalence of approximately 2% in the United States [2–4]. A developmental disorder of spatial vision, amblyopia is clinically defined as decreased best-corrected visual acuity (VA) in 1 or, less frequently, both eyes, in the absence of any obvious structural anomalies or ocular disease.

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It is associated with abnormal visual experience, most commonly strabismus, anisometropia, or form deprivation that occurs during a sensitive period of visual development in infancy or early childhood.

Signs, symptoms, and quality-of-life concerns

In addition to reduced best-corrected VA, there are a plethora of visual function deficits of the amblyopic eye, including abnormal contour interaction [5], reduced contrast sensitivity [6], positional uncertainty [7], spatial distortion [8], poor accommodation [9], abnormal eye movements [10], and suppression [11]. Because of good vision in their nonamblyopic (sound) eye, persons with unilateral amblyopia typically do not complain of blurred or poor vision under habitual binocular viewing conditions; however, recent studies have reported reduced reading speed [12] and compromised fine-motor skills [13] even with both eyes open.

There are important public health consequences when amblyopia is left untreated. Patients with amblyopia are more likely to become visually disabled because of an increased risk of their sound eye becoming visually impaired [14,15], with their estimated lifetime risk of visual impairment at least 1.2% [15]. Vision loss in the sound eye, often caused by trauma, can have a significant effect on quality of life with many employed individuals no longer able to work because of inadequate visual function [15,16]. Although amblyopic eye VA can sometimes improve in adults after vision loss of their sound eye, most remain visually disabled [17]. Furthermore, the presence of unilateral amblyopia has a deleterious effect on binocularity, including stereopsis. Because good VA in each eye and/or normal stereoacuity is often a prerequisite for certain vocations such as the military, aviation, surgery, law enforcement, and firefighting as well as for obtaining a commercial driver's license [18], amblyopic individuals are often precluded from participating in such occupations [19].

Historical perspective on amblyopia treatment

Historically, the mainstay of amblyopia treatment has been patching of the sound eye. Treatment regimens have been a matter of individual preference based on the training, observations, and clinical impressions of the treating optometrist or ophthalmologist. Generally, when it came to patching, the adage was "time was of the essence," so patching was prescribed in conjunction with the refractive correction because of the notion that treatment beyond a certain age (variously stated as between 6 years and 9 years) would not be beneficial [20]. The more-the-better principle was followed by many eye care providers with full-time patching thought to be preferred, if not imperative, for a successful outcome, particularly for severe amblyopia. Atropine penalization was not considered a first-line treatment modality and thus generally advocated only for young children with moderate levels of amblyopia who had failed patching.

Amblyopia Treatment Studies

The Pediatric Eye Disease Investigator Group (PEDIG) is a clinical network of pediatric optometrists and ophthalmologists funded by the National Eye Institute to

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