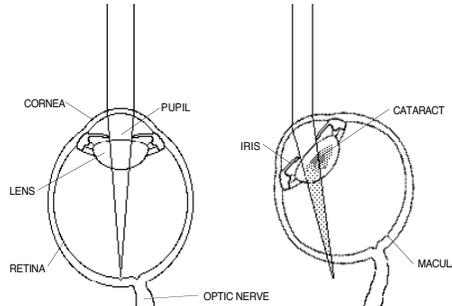


# AMBLYOPIA



The eye on the right is at risk for all three types of AMBLYOPIA. Rays of light enter the normal eye on the left, are bent by the cornea and the lens and are focused on the most precise part of the retina called the macula. Light entering the right eye is disrupted by a congenital cataract (*deprivational amblyopia*). Since the right eye is shorter than the left, light doesn't focus on the retina due to unequal far-sightedness (*refractive amblyopia*). Since the left eye is crossed (esotropia-type strabismus), incoming light fails to align on the macula (*strabismic amblyopia*).

Eye doctors and orthoptists want each child to grow up with the healthiest visual system possible. This goal requires the close cooperation of parents, pediatricians, primary doctors, optometrists, school nurses and health aids and the professionals who deal with visually impaired babies.

At birth, a normal infant has relatively poor vision in the range of 20/2000! Under normal conditions, the visual system improves so that 20/20 vision might be attained by school age and retained after age 10 years. The child's brain gradually learns the best vision it receives from the eyes over the first decade. Disruption of brain visual development is called AMBLYOPIA. A common, but ambiguous term for amblyopia is "lazy eye." If a child develops amblyopia and fails to receive intensive treatment before the age of ten, permanent brain visual loss results for one or each eye! Treatment of amblyopia is the specialty of orthoptists and pediatric ophthalmologists.

**CAUSES OF AMBLYOPIA:** Amblyopia can result from three main causes: 1) unformed images, 2) unfocused images and/or 3) misaligned images. All three are shown in the figure.

**Deprivational Amblyopia** is caused by untreated unformed image visual development. This may be due to congenital cataracts or opacities in the lens of one or both eyes. An infant with a cataract sees as if looking through a Kleenex®; light, dark and color or close large shapes are all that can be seen. Cataracts in infants need urgent care with surgical removal, optical rehabilitation with glasses or contact lenses (by age 1 week to 4 months) and a decade of close monitoring to attain best vision.

**Refractive Amblyopia** is caused by untreated poorly focused eyes. This can be due to high or unequal amounts of far-sightedness (hyperopia), near-sightedness (myopia), astigmatism or unequally focused eyes (anisometropia). Such children can be detected by distance vision chart failure when they become verbal (age 3-5). Ideally refractive amblyopia is detected and treated even earlier. Such children might like to sit close to TV or hold objects very close.

**Strabismic Amblyopia** is caused by misaligned eyes in children. Strabismus includes conditions commonly called "cross-eyed," "wall-eyed," or "squint." Rather than suffer with double vision, a child's brain

frequently suppresses or "turns off" the brain image from the non-dominant eye. Strabismic amblyopia can be treated by combinations of drops, glasses, patching and/or eye muscle surgery.

**DETECTION:** Within the first days after birth, part of each baby's first physical exam is the "red reflex" an abnormality of which could indicate cataract or tumor. A part of routine pre-school pediatric check-ups is observations of red reflex by **photoscreen** and Brückner Test, eye movements and alignment and the ability of each eye to independently follow and interesting object. Verbal children are given a picture or letter chart test on a wall-chart or with a device similar to Driver's exams. Severe amblyopic conditions should be detected in pre-verbal children using a Photoscreening device, also.

**TREATMENT:** An analogy can be drawn between amblyopia treatment and teaching a child to swim in the deep end. Until that child is old enough (10) and an experienced swimmer, a parent will either protect them with life-preservers, watch them very closely, or both depending on age. Combinations of **patching**, dilating eye drops (**Atropine**), **glasses** or eye muscle **surgery** act like life preservers for the visual development of one or both eyes and frequent eye exams is like close observation of a fledgling swimmer.

Amblyopia afflicts approximately 5% of children. With proper vision screening and early, persistent treatment, amblyopia should be entirely treatable. Infants' eyes should be examined as a part of their initial pediatric exam; cataracts or other serious causes of deprivational amblyopia can be detected at day one. Children who fail an eye screening by age one year should receive a thorough exam by an eye doctor including dilating drops, refraction and thorough retina and lens exam. We think, each child should receive at least one dilated eye exam before age 7 years even if no symptoms or vision screen failures are encountered. Our goal is to **Eliminate Amblyopia in Alaska**: detect and treat all amblyopia so children see as well as possible.

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