



The Alaska Blind Child Discovery

A cooperative, charitable research project to vision screen all pre-school Alaskans



ASD-ABCD

Simplified acuity testing compared with photoscreening for Kindergarten, First-grade and pre-K in the Anchorage School District

Generous ABCD Sponsors:

District 49-A Lions (Girdwood, Bethel, Bristol Bay, Big Lake, Homer and Kenai), 49B Fairbanks Lions, Public Health Services (Dillingham, Valdez, Homer, Anchorage, Bethel and Juneau), Kodiak Kiwanas, Valdez Masons, Chugachmuit Corp, Ophthalmic Associates, The Eye Clinic of Fairbanks, Seward Hospital, Andrew and Elle Arnold, M.T.I., Infant Learning Programs, Northern Air Cargo, Yute Airlines, ERA, Alaska Air, Alaska Aircargo, 40-Mile Air, Special Education Services Agency, Children's Hospital @ Providence and the Children's Miracle Network, Alaska Summer Emergency Ophthalmologists, Bartlett Memorial Hospital, Alyeska Pipeline, Denali Safety Council, Channel 2 News, EyeDx and Dr. Sean P. Donahue, M.D., Ph.D., Eye Care and Cure.

District 49 Lions Club



Dr. Sean Donahue (center), who runs the Lions-funded Tennessee photoscreening project confers with Alaska Lions photoscreening experts John Rgan (right), Diane Armitage and Nancy Rogers (left).

ABCD is absolutely dependent on charitable organizations and is particularly thankful for the contributions of funds, people, time and leadership from the District 49 Lions Clubs. District 49B Lions have screened many children at the Tanana Valley Fair while District 49A Lions have conducted screenings in the Y-K delta, Bristol Bay, Kenai Peninsula, Mat-Su Valley and Anchorage. Attention to detail by experienced Lions from the Regan and Rogers families resulted in a Positive Predictive Value over 90% and specificity of 98% in 2500 kids at the Alaska State Fair.



Committed to reducing blindness in Alaskan children (and adults): Drs. Coon, Sternberg, Wolf, Rosen, Arnold, Morgan, Steiner and Crouch at the ABCD Coordinating Center at Ophthalmic Associates

The ABCD Coordinating Center

The eight doctors and 30 employees have donated over \$100,000 in supplies, labor and professional services to ABCD since 1996. Dr. Arnold and Coon provide interpretation of the photoscreen images. Orthoptist Diane Armitage administers the collection and mailing of notices to parents and screening clinics. Student research investigators include Tatiana Kovtoun, M.D., Adam Jastrzebski, Elisha Gionet, Christy Machida, Jenny Hultquist, Heather March, Jason Hickel, Andrew Arnold and Dustin Lang.

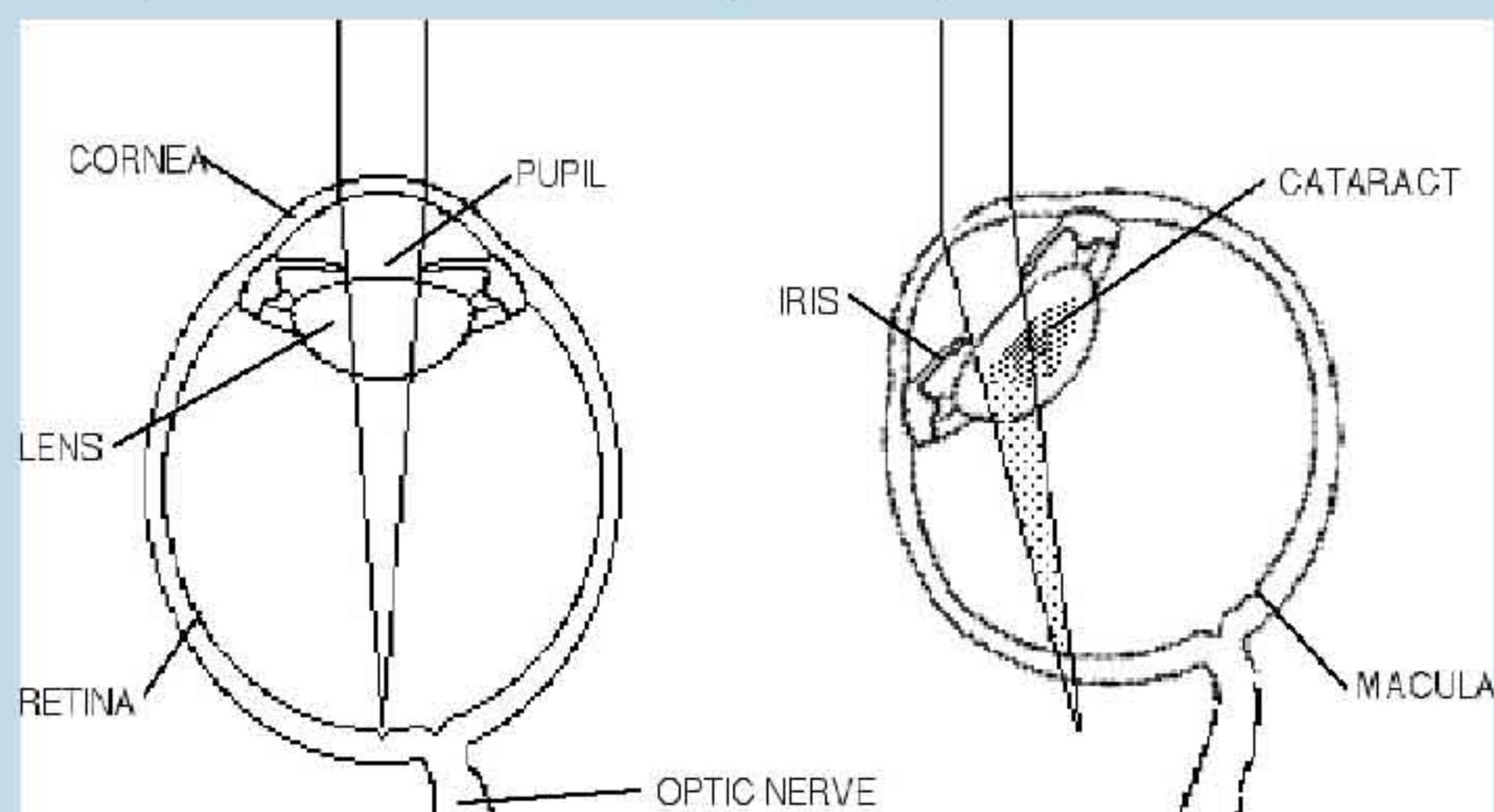
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Rationale and Implications of Pediatric Vision Screening

The Problem: Undetected Amblyopia

Three to five percent of children have the potential to go blind from a condition called "amblyopia." During the first ten years of life, the vision center of the brain can learn to see clearly; amblyopia is a disruption in the normal learning process due to 1) obstructed images (i.e. cataracts), 2) misaligned eyes (strabismus) and/or 3) poor focus (refractive 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) and are bent by the cornea and lens being 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 farsightedness (refractive amblyopia). Since the left eye is crossed (esotropia-type strabismus), incoming light fails to align on the macula causing strabismic amblyopia.

Refractive Errors:

Vision screening may also detect children who need glasses as a result of nearsightedness (myopia/ long eye), farsightedness (hyperopia / short eye) or astigmatism (non-round surface of the cornea).

The Potential:

Amblyopia is suspected when a child fails acuity testing. It is very important these children not be able to peak around a band or occluder with the better, "untested" eye so ABCD provides "EYE ✓ @ 4" patches as a fun way to occlude the non-tested eye. Amblyopia is confirmed by a complete eye exam with an eye doctor. Almost all amblyopia can be cured with thorough, consistent treatment through the age of 9 or 10 years. Most doctors believe that better results can be achieved with early detection especially in cases of congenital cataract and unequal farsightedness (anisometropia). When acuity testing is not practical in younger children, Photoscreening can detect many cases of amblyopia.

Over 100 Alaskans have participated in the NIH-funded "Amblyopia Treatment Study" which compared doses of patching, atropine dilating drops and spectacles for patients with amblyopia due to strabismus and/or high refractive error



Dr. Robert Arnold (center) with photoscreen "visionaries" Sean Donahue (left) from Vanderbilt and David Granet (right) from San Diego.

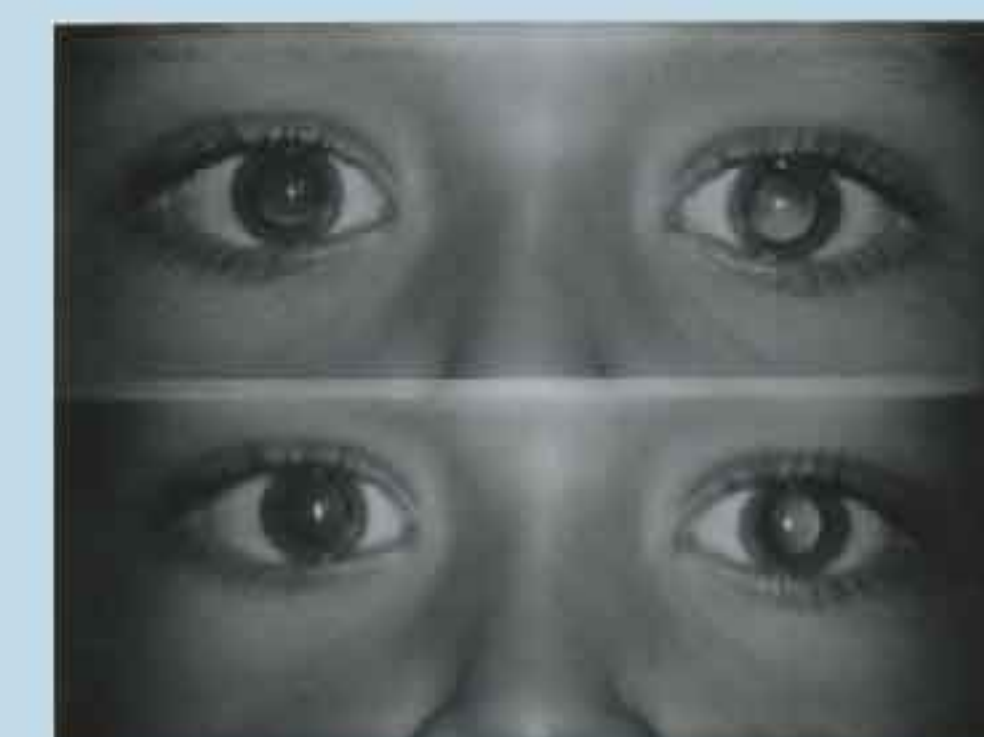
Photoscreening:

Photoscreeners are cameras with the flash located close enough to the lens to produce a "red reflex" in the pupils. When a normal child aligns both focused eyes on the camera, a uniform "red reflex" is produced. On the other hand, when an eye is either unfocused or misaligned, a variation in the red reflex occurs that doctors interpret as increasing the risk of amblyopia. ABCD and Vanderbilt University have extensive state-wide experience with the black-and-white Polaroid MTI photoscreeners since late 1995. More recently, ABCD has investigated some digital photoscreeners made by JVC and Gateway that can be interpreted similar to the MTI images. ABCD hopes to promote inclusion of computer interpretation of images (like Dr. David Granet's EyeDx) into next-generation vision screeners so parents could get valid results immediately at the time of screening.

Photoscreen normals



Left eye too farsighted (2D)



MTI



JVC



Gateway DV-S20

What should be done?

Vision Screen Interpretation:

Within weeks of an ABCD screening, parents will be mailed a photocopy of their actual paperwork with images and "Warning Signs" of pediatric eye disease. The doctor's interpretation will be circled in the lower left corner of the screening report. One child in seventeen will have a "positive" interpretation; these children should be referred to the nearest convenient eye doctor for a confirmatory complete eye exam including careful age-appropriate acuity testing and cycloplegic refraction. Either of Alaska's pediatric ophthalmologists, Dr. Robin Grendahl or Dr. Robert Arnold in Anchorage, would be able to assist your eye doctor in evaluation or treatment since more than 80% of referred screenings will have a significant, and potentially blinding vision problem. About 94% of screenings will result in "normal" interpretations but should continue to be observed at home for the "Warning Signs" (on the back page of the screening report). Approximately 6% of "normal" interpreted screenings will also have a comment that the child shows signs of mild refractive error that some parents would like to confirm and/or consider spectacle