



Amblyopia, also called lazy eye, is a disorder of sight due to the eye and brain not working well together. It results in decreased vision in an eye that otherwise typically appears normal.

A retired German who was blind in one eye, founded the company Plusoptix in 2008, ploughing his knowledge and energy into creating what is now the latest technology in vision screening to prevent amblyopia.

With current technology it is difficult to perform visual screening on children because it is time consuming to get a reading. With the Plusoptix machine, babies and toddlers can be screened without difficulty or duress. In the first three years of a child's life amblyopia can be prevented.

Before one year of age, a child can be screened to determine their amblyogenic risk factor. At this time the eye of the child is sensitive and adapts extremely well to the treatment. So well in fact that amblyopia can be prevented. At age two, detection and prevention through treatment is still good but starts to decrease. Three years old is considered to be a critical boundary because at this age, the child falls within the "amblyopia prevention range" but is on the cusp of "the amblyopia detection range". The latter range is when amblyogenic risk factors have already caused amblyopia and it is at this critical boundary when the child can no longer be helped with their visual impairment.

Because amblyopia is irreversible, this emphasizes the need for early vision screening for the prevention thereof. When we talk about detection there are a number of visual acuity tests for babies e.g. the stereo Lang Test which checks that both eyes are working. This test needs co-operation and time. The LEA Symbols test is a standard test for children that are slightly older because it requires that the child can talk and co-operate. The most sophisticated visual acuity tests are the Tumbling E Test and the Landolt-Rings Test. A child needs to be at least 4 years old to do these tests.

Transillumination testing of the eye can be performed in two ways, using either a) a direct ophthalmoscope that shines bright white light or b) a plusoptix Vision Screening machine using infrared light.

The below table shows a comparison between the Red Reflex and Plusoptix transillumination tests.

<b>Transillumination Tests</b>	
<b>Red Reflex Test</b>	<b>plustoptiX</b>
Uses ophthalmoscope	Uses Plusoptix machine
Bright white light shined into each eye	Infrared light shined into eyes
Eyes are test individually	Simultaneous assessment of both eyes
Distance of practitioner from subject: 20cm – 40cm	Distance of practitioner from subject: 1 metre
Is time sensitive	Is not time sensitive. Takes approx. 1 second to get a reading without dilation
Test has to be done in dimmed room	Test can be done in a normally lit room
Bright white light causes glare, constricts pupil size	Infra-red light avoids glare and keeps pupils wide
Possible cycloplegia	No cycloplegia
Constriction of pupil size limits test area	Test area is quadrupled if pupil size is doubled
Aim: to detect media opacities and abnormal reflexes from the retina	<p>Aim: to detect media opacities and abnormal reflexes from the retina.</p> <p>Other visual disorders can be quantified with values:</p> <p>Refractive error</p> <ul style="list-style-type: none"> <li>- Hyperopia (farsightedness)</li> <li>- Myopia (nearsightedness)</li> <li>- Astigmatism</li> </ul> <p>Anisometropia (different refractive errors)</p> <p>Anisocoria (different pupil sizes)</p> <p>Hirschberg test</p> <ul style="list-style-type: none"> <li>- Asymmetry of gaze (indication of strabismus)</li> </ul>
Cannot document findings	Reading provides analytical data such as image of pupils and values. Device will give practitioner an indication if subject needs referral to eye specialist.
Needs skill of practitioner	Automated skill
Needs co-operation of subject	Does not need co-operation of subject
High risk of missing something vital	No risk of missing vital information
No documentation of eye test images and readings	Electronic documentation of eye test images and readings