

## Helping People Who Have Double Vision (Diplopia)

The National Institute for Rehabilitation Engineering (NIRE) is a non-profit organization which operated clinics for the development and dispensing of vision aids (with training) from 1967 through 1987. These clinics assisted *hundreds* of people having permanent impairments of visual acuity, convergence and/or visual fields. This paper summarizes successful clinical methods developed and used during this period for assisting individuals having DOUBLE VISION (Diplopia). Because the NIRE no longer operates these clinics, the information is being made available so that NIRE's methods and data may be used by vision-care professionals all over, to help individuals having Double Vision. *PERMISSION is granted for the free copying and distribution of this © paper provided copies are complete and unaltered.*

With NORMAL VISION In Each Eye: Typically, for people with normal or near-normal visual acuity in each eye, double vision may be perceived as: (a) two distinct images, **not** merged to be one stereoscopic image; (b) as a single blurred image; or (c) a single flat (non-stereoscopic) image with one eye turned off - or with vision alternating back and forth from one eye to the other. In these situations, **the eyes may not be converging properly** and may not be producing a single, fused stereoscopic image - with the observed effects described. Although less common, there can be causes other than misconvergence for Diplopia.

With REDUCED- or NO- VISION In One Eye: If the person has greatly reduced visual acuity in one eye (or no vision in one eye) and normal acuity in the other eye, then double vision is **not** likely to be the result of misconvergence. Instead, the symptoms may be due to neurological problems or to a physical problem within the one good eye.

### **Q. Who Should Be Examined and Tested for Double Vision?**

- A.1.** Any person experiencing the symptoms described above.
- A2.** Any person whose eye doctor feels he should be tested, whether or not aware of possible Diplopia or double vision.
- A3.** Any person who has dead spots (scotomas) in the retina of either eye, or both eyes, because giving that person fully fused binocular vision may eliminate or greatly reduce the annoyance and hazards caused by the scotomas.

CAUTION: Diplopia or double vision can be caused by eye diseases, by certain systemic diseases, or by neurological conditions. This paper details functional help with optical correction, only. **ALL PEOPLE WITH DIPLOPIA SHOULD FIRST SEEK ASSISTANCE by a qualified medical eye physician (an ophthalmologist).** The ophthalmologist will determine if the symptoms result from problems within the eye, from misconvergence of the eyes, or from some neurological or systemic disorder apart from the eyes. The ophthalmologist is the primary doctor to visit and can be depended upon to

make referrals to neuro-ophthalmologists, neurologists or other specialists if and as appropriate.

## INFORMATION ABOUT DIPLOPIA

1. General: Double Vision (Diplopia) symptoms rarely improve by themselves. They are likely to remain the same or to gradually worsen over time. They should be diagnosed and treated promptly, both to stop or reverse diseases that may be cause – or simply for the patient’s comfort and convenience if the cause is misconvergence of the two eyes.

### 2. Convergence Problems:

A. If the eyes are so badly misconverged that they appear to others to be either turned inward, “crossed”, or to be turned outward, “wall-eyed”, then surgical correction is likely to be needed, by an ophthalmologist.

B. If the double vision is due to misconvergence that is minor (so that the eyes do not appear abnormal to bystanders), then eyeglass correction may be helpful. NOTE: Even after eye muscle surgery (as in A. above), corrective eyeglasses may still be needed.

## OPTICAL CORRECTIONS

Traditional eyeglass lenses are usually ground to correct two types of **refractive errors**: (1) focal distance errors ... such as nearsightedness ... or farsightedness; and/or (2) irregularities in the curvature of the cornea ... cylinder or astigmatism.

A third type correction is also possible. It is called: “prism correction.” This correction displaces the image slightly, up, down, left or right, or to any angle desired. This is actually **position correction** when applied to one eye – or **convergence correction** when applied in a coordinated way to both eyes.

Patients having Diplopia are usually tested with trial lenses in the eye doctor’s office. Some **ophthalmologists** take the time to do this testing themselves, and then they write eyeglass prescriptions that can be filled by any optical dispenser. Many Doctors of Optometry (**optometrists**) also refract and evaluate patients for convergence error correction, and make, dispense and fit the eyeglasses, themselves.

Prescription eyeglasses having prism correction are usually perfectly normal looking and not noticed as being different by others. For patients who use bifocal, trifocal or variable focus lenses, the prism corrections can usually be

added so that the eyeglasses provide full fusion at all distances, through all of the lenses segments. A few people may need different prism correction near and far, and so may need separate eyeglasses, each with different prism corrections, for reading and distance vision.

Prescription eyeglasses with prism for convergence correction can be made as sunglasses when this is desired.

### **LASIK, CONTACT LENSES and Other Alternatives** (to eyeglasses)

One never knows what the future will bring – but, at this time:

1. refractive laser surgery such as LASIK cannot correct convergence
2. contact lenses generally cannot correct convergence although some research is being done on non-rotating contacts with prism.

At present, the use of eyeglasses having prism characteristics ground into each lens is the best and most used method of compensating for mild misconvergence in order to achieve fused binocular vision. Remember that some people with more severe misconvergence of the eyes will need surgery to the eye muscles to realign or straighten one or both eyes.

**SUPPRESSED VISION IN ONE EYE** occurs, rarely, as the brain's turns off one eye to correct the blurring that might otherwise result from double vision. Some individuals who have vision suppressed in one eye can be helped to regain fused, binocular vision with both eyes, with convergence correction eyeglasses plus vision retraining exercises. (Some ophthalmologists offer these services but many refer such patients to optometrists.)

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For additional information or free technical support, please email: [nire@warwick.net](mailto:nire@warwick.net) or contact us by regular mail or telephone.

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