



**the
refraction letter**

**A Monthly Informational Service for the Eye Care Professions from
Bausch & Lomb**

Improving visual acuity of the nystagmic child.

Maximize a child's visual acuity by minimizing the oscillation of the eyes.

All too often, after refracting patients with congenital nystagmus (CN), the diagnosis becomes both the initial and the final result. *Simply sending the nystagmic child home -- amid assurances that his condition is benign, but will persist, and must be tolerated -- is a disservice to the patient.* By so doing, the practitioner may inadvertently prolong factors which adversely affect the child's intellectual, emotional and social development.

Poor vision consequent to CN may impede educational development and deny a child needed mobility by preventing him from obtaining a driver's license. The embarrassment suffered with "shifty eyes" and head-turn, when present, may retard social growth and impede successful job interviews.

The child whose visual acuity is limited by CN alone (rather than by his correctable refractive error) can be helped if the practitioner exploits the variability of the CN itself. Accurate, quantitative eye movement recordings can be used to identify null regions of gaze where nystagmus intensity (the product of amplitude and frequency) is minimal. Further nulling upon convergence, a frequent phenomenon, will also be obvious from such records. Armed with these quantitative measurements, several courses of action are possible.

1. If the null angle is within $\pm 5^\circ$ of straight ahead, the proper prisms can shift both eyes the required amount. (The $\pm 5^\circ$ limit is due to the high weight and chromatic aberration associated with strong prisms. We do not prescribe lenses greater than 11^Δ to 12^Δ in either eye. Larger shifts can be obtained with Fresnel prisms, but the vertical grating may be intolerable to some patients -- especially at night when lights glare through each of the many prism bases.)

2. If convergence causes a nystagmic null, base-out prisms can induce convergence.

3. If both version and vergence produce nulls, composite prisms can accomplish the required gaze angle shift as well as convergence.

4. If the null angle is too eccentric for prisms, a surgical procedure to shift the null as close to straight ahead as possible can be considered. Then, after ocular motor retesting, prisms can be used to "fine tune" the ocular system so the eyes are at exact null angles.

The following example serves to illustrate the prism prescription derived from measurements of null angle and convergence angle. BR and BL refer to prisms base-right and base-left respectively (i.e., BR is base-out for the right eye and base-in for the left eye).

Example.

Desired version shift = 4^Δ left.

Desired vergence shift = 14^Δ .

	<u>O.D.</u>	<u>O.S.</u>
Version	4^Δ BR	4^Δ BR
Vergence	7^Δ BR	7^Δ BL
Composite	11^Δ BR	3^Δ BL

	<u>Total</u>
Version	$(11-3)/2 = 4^\Delta$ left.
Vergence	$11 + 3 = 14^\Delta$.

All the above actions exploit the nulls of CN, allowing the patient to see through eyes that have minimal motion, thereby improving visual acuity. Placing the patient at his null is *not* the same as allowing him to turn his head. The more effort the patient exerts to see, the greater the nystagmus because of the positive feedback nature of nystagmus generation (i.e., increased effort increases nystagmus). Thus, the very act of turning the head tends to negate the beneficial effects of arriving at the null in this manner.

The main object of any therapy is to move the patient's visual world (via prisms) or his eyes (via surgery) so that the patient can see as clearly as possible at first glance with no additional effort.

The minimization of the "effort-to-see" or "fixation attempt" should be the aim of the practitioner since it is the patient's attempt to fixate which generates and increases nystagmus intensity and, correspondingly, decreases visual acuity.

The above techniques, when applied to patients with CN, often improve visual acuity by several lines (e.g., 20/40 best corrected visual acuity without prisms improved to 20/25 with prisms). Patients should also be instructed in the importance of viewing flat objects from a nearly perpendicular angle to minimize the "horizontal shrinking" effect of their horizontal eye oscillations. During classes and movies, the patient must always sit up front and in the middle of the room (as measured from left to right). This central-front position insures that even characters written on either side of the front board will be viewed at a greater angle than if observed from a more lateral seating position.

Maximizing visual acuity by minimizing eye oscillation, at the very least, provides the child who has CN with the visual tools necessary to learn more, pass various required eye examinations and compete equally with his non-nystagmic peers in sports. Reducing oscillation should help minimize the patient's self-consciousness and anxiety about his "shaky eye". Since anxieties contribute to increased nystagmus intensity, anxiety reduction is an important adjunct to increasing a patient's visual acuity.



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"I would not think of having a doctor I didn't like. The reason has nothing to do with professional competence, which I cannot judge anyhow. My liking him won't make him a better doctor, but I think it will make me a better patient."
Shana Alexander in "An ordeal to choke a sword-swallower", *Life*, January 21, 1966.