

## A PRIMER ON THE HORIZONTAL GAZE NYSTAGMUS TEST

By Kurt M. Hughes, Esq.

The purpose of this article is to provide counsel with a basic understanding of nystagmus, particularly as it relates to DUI prosecutions and the Horizontal Gaze Nystagmus test utilized by law enforcement officers in the field.

Nystagmus is defined as a rapid involuntary oscillation of the eyeballs (as from dizziness). It occurs when there is a disturbance of the vestibular (inner ear) system or the oculomotor control of the eye. Horizontal gaze nystagmus (HGN) refers to a lateral or horizontal jerking when the eye gazes to the side. In the context of DUI prosecutions, alcohol consumption (or consumption of certain other central nervous system depressants, inhalants or PCP) impairs the ability of the brain to correctly control eye muscles, which in turn causes the rapid eye movement associated with HGN. As the degree of impairment becomes greater, the jerking or bouncing of the eyeball becomes more pronounced. It is this movement which law enforcement officers attempt to quantify using the horizontal gaze nystagmus test. Horizontal Gaze and Nystagmus, The Science and the Law.<sup>1</sup>

It should be noted that nystagmus can also result from neural activity. Optokinetic Nystagmus occurs when the eye is focusing on a fixed object that rapidly moves out of sight. This most commonly occurs in DUI cases when the suspect is facing traffic or the cruiser's blue lights, flashers or wig wags. Pathological disorders such as brain tumors, or head injuries, can also cause nystagmus.

The horizontal gaze nystagmus test is one of three standard field sobriety tests that make up the standardized field sobriety tests (SFST's). The other two tests are the walk-and-turn test and the one-leg-stand test. The Vermont Criminal Justice Training Council's DUI Student

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1

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Manual (09/2000 edition) proclaims that the horizontal gaze nystagmus test is “the most reliable” field sobriety test.

Officers are taught to administer the HGN test in three separate components, always beginning with the left eye: 1) lack of smooth pursuit (as the eye moves from side to side, does it move smoothly or does it jerk noticeably), 2) distinct nystagmus at maximum deviation (when the eye moves as far to the side as possible and is kept at that position for approximately four seconds, does it jerk distinctly) and 3) onset of nystagmus prior to 45 degrees (as the eye moves toward the side, does it start to jerk before it has moved through a 45-degree angle). Before going forward with the actual test, however, the processing officer must first check to see if the subject’s eyes track the stimulus together. If they don’t, this is indicative of a possible medical disorder or injury. Similarly, the officer must check to be sure that the subject’s pupils are of equal size. If they are not, this may indicate a head injury.

The officer scores the test by allotting one point per eye for each of the components described above. The maximum number of clues that may appear in one eye is three, and the maximum total number for any subject is six. The VCJTC DUI Student Manual claims that research establishes that if four or more clues are present, it is likely that the suspect’s blood alcohol concentration is above a .10 BAC. The manual claims that the test is 77% reliable using this criterion.

Thus, prudence dictates that defense counsel file a motion *in limine* for an order excluding the evidence regarding the processing officer’s administration of the HGN test. Depending on the practice in your county, the motion should be filed at or immediately after the jury drawing. Since you will likely be preoccupied with other matters during the course of your trial preparation, a motion will be posted on our web site for you to download and modify to meet your specific needs (see [www.murdochandhughes.com](http://www.murdochandhughes.com)).

The State should be precluded from introducing evidence of the horizontal gaze nystagmus (HGN) test unless it has given notice of expert testimony on this subject. A majority of jurisdictions around the country have concluded that the HGN test, unlike the walk-and-turn and one-leg-stand field sobriety tests, is based on a scientific principle not generally known by lay jurors. Due to its scientific nature, HGN test results are not admitted by these courts unless expert testimony is offered which meets the criteria set forth in Daubert or Frye. For a list of cases supporting this proposition, see State v. Doriguzzi, 760 A.2d 336, 340 (N.J. Super. 2000).

The cases and literature on the subject indicate that, in addition to alcohol, many other factors have been listed as a possible cause of nystagmus. They include: (1) problems with the inner ear labyrinth; (2) irrigating the ears with warm or cold water under peculiar weather conditions; (3) influenza; (4) streptococcus infection; (5) vertigo; (6) measles; (7) syphilis; (8) arteriosclerosis; (9) muscular dystrophy; (10) multiple sclerosis; (11) Kerchief's syndrome; (12) brain hemorrhage; (13) epilepsy; (14) hypertension; (15) motion sickness; (16) sunstroke; (17) eye strain; (18) eye muscle fatigue; (19) glaucoma; (20) changes in atmospheric pressure; (21) consumption of excessive amounts of caffeine; (22) excessive exposure to nicotine; (23) aspirin; (24) circadian rhythms; (25) acute trauma to the head; (26) chronic trauma to the head; (27) some prescription drugs, tranquilizers, pain medications, anti-consultants; (28) barbiturates; (29) disorders of the vestibular apparatus and brain stem; (30) cerebellum dysfunction; (31) heredity; (32) diet; (33) toxins; (34) exposure to solvents, PCBS, dry cleaning fumes, carbon monoxide; (34) extreme chilling; (35) eye muscle imbalance; (36) lesions; (37) continuous movement of the visual field past the eyes, i.e., looking from a moving train; and (38) antihistamine use. Schultz v. State, 664 A.2d 60, 77 (Md.App. 1995), citing, inter alia, Mark A. Rouleau, *Unreliability of the Horizontal Gaze Nystagmus Test*, 4 Am.Jur. *Proof of Facts* 3d 439 (1989); Louise J. Gordy & Roscoe N. Gray, 3A *Attorney's Textbook of Medicine* §§ 84.63 and 84.64 (1990).

Vermont trial courts have also concluded that expert scientific testimony is required before the State may present HGN evidence to a jury. HGN testimony must be supported by scientific evidence based upon the principles of reliability and relevance. Daubert v. Merrell, Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993); State v. Streich, 163 Vt. 331, 343 (1995); State v. Twofoot, 4 Vt.Tr.Ct.Rptr. 32 (Morris, J. 1999). The HGN test “rests on physiological principles that are foreign to a juror’s experience and provides information that is essentially meaningless to a lay person unless accompanied by an explanation based on scientific or specialized knowledge.” State v. Hathaway, Windsor District Court, Docket No. 746-6-02Wrcr; 78-5-02Wrcs (DiMauro, J. 2002), quoting State v. Larabee, 4 Vt.Tr.Ct.Rptr. 30 (Cook, J. 1999). In one of the more detailed trial court opinions, Judge Grussing denied the defendant’s motion to suppress the HGN test, but ruled that in addition to a properly trained police officer, the State must introduce expert testimony relating nystagmus in general and the observations of the officer in particular as a cause of impairment resulting from the consumption of alcoholic beverages. State v. Dufour, Windham District Court Docket No. 586-4-96Wmcr, 1 Vt. Trial Court Rptr. 183 (Grussing, J.1997).

In conclusion, while HGN evidence appears to have a solid scientific foundation in the relevant literature, the State seldom has the time, funding or inclination to put forth expert testimony sufficient to have testimony about the test admitted into evidence, and a motion *in limine* will generally be successful.