

"THE EYES HAVE IT"

H.G.N. REVIEW AND UPDATE

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Editor's note: This article *is* the first in a series on Horizontal Gaze Nystagmus. The first article *will* deal with the basic elements of the technique. The second article, to be published in the March/April edition, *will* deal with direct examination *of* an HGN officer. The third and last article *will* discuss cross examination.

Practitioners *of* HGN *will* find Officer Unsworth's discussion valuable in that it incorporates the latest in curriculum modifications. Many officers *will* have completed their training years ago, and this is a good recap. Reviewing this series of articles *will* be useful in preparing for trial. Numbers reference sources.

Historical Background

Alcohol-induced nystagmus has been observed as far back as 1842.(1) Its use as an indicator of DUI is more recent. Sergeant Richard Studdard, Los Angeles Police Department, first became involved with HGN in 1960 at the LAPD Academy where he was taught to use it to test for barbiturate intoxication. It was then called the "Barb Bounce."

Research by Sergeant Studdard showed that HGN can be induced by a variety of Central Nervous System Depressants, including alcohol. In 1971 the LAPD began to encounter problems with convicting suspects who were driving under the influence of drugs other than alcohol. The department decided to design a standardized field sobriety test battery that was sensitive to both alcohol and other drugs.(2)

Initial experience in the field actually administering the HGN test showed a direct correlation between the percentage of alcohol (BAC) and HGN. In 1977 Drs. Burrs, Tharp, and Moscovitz, of the Southern California Research Institute, became involved.(11) Their studies and findings corroborated Sergeant Studdard's initial observations. Sergeant Studdard actually participated in a number of the double blind studies himself. The study results were dramatic. The results of the HGN test were extremely close to the test subject's actual BAC. The results of these research studies were used by the National Highway Transportation Safety Administration (NHTSA) to develop their HGN training manual "Standardized Field So-

briety Testing."(2)

Sergeant Studdard continued to research the signs and symptoms of drug acid alcohol impairment. His efforts led to the training of LAPD officers as Drug Recognition Experts or "DREs", and hence the DRE program was born. He became a consultant to NHTSA and mail addressed to "Sgt. Nystagmus", L.A.P.D., easily found its way to his desk.

HGN training was first given to Arizona police officers in 1983. In 1987 selected Arizona police officers from various agencies were sent to Los Angeles where they were trained as DREs. In 1988 the first "in-state" DRE school was held in Phoenix,

Arizona.

At this time additional officers in the State of Arizona are being trained as HCYN technicians and DREs. This is largely due to the early pioneering efforts of the following individuals: Lieutenant Robert Halliday, Arizona Department of Public Safety, Sergeant William Hansen, Arizona Department of Public Safety, Sergeant Robert Hohn, Arizona Department of Public Safety (the arresting officer in the Blake decision), Sergeant Robert Sparks, Phoenix Police Department, and Cliff Vanell, Phoenix City Prosecutor's Office.

In 1986 the Arizona State Supreme

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Photo: courtesy Dick Parkans, Arizona D.P.S. Photo Lab

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Court handed down the Blake decision.(2) This decision reaffirmed the accuracy and validity of the HGN test and said that an officer's observations of the test results can be admitted as evidence to prove a DUI charge. This decision also held that the HGN test meets the Erve standard of scientifically reliable evidence ("...whether the technique is generally accepted by the relevant scientific community").(4)

Nystagmus comes from a Greek tenn, meaning to "jerk".(3) Horizontal Gaze Nystagmus, or HGN, can be defined as jerking of the eyes as they gaze to the side. In most cases this is involuntary; the person being tested is unaware that it is happening and is unable to stop it. There are a few people who can intentionally cause this to happen. In the HGN that we observe as a standardized field sobriety test, the eyes are tracking a moving object (a stimulus) as it moves to the side. (5)

HGN is a natural, normal phenomenon. Alcohol doesn't cause HGN, it exaggerates or magnifies it to the extent that it can be easily seen with the naked eye.(5)

HON is not the only kind of nystagmus.(6) In fact, there are over 120 different kinds or types of nystagmus. This is an important point to emphasize when testifying: although there are many types of nystagmus; the only one we are talking about is HGN, also known as alcohol induced nystagmus in DUI/alcohol cases.

It's important to know about some of the other common types of nystagmus. Though there are many different types of nystagmus they can generally be grouped into three categories.

The first category is known as vestibular nystagmus. This is caused by movement or action to the vestibular system. The vestibular system is a sense organ located in the inner ear. It provides information to the brain and the eyes about position and movement of the head. This is to maintain the balance and orientation of the body.

There are four main kinds of vestibular nystagmus. These are rotational nystagmus, post-rotational nystagmus, caloric nystagmus, and positional alcohol nystagmus.

Rotational nystagmus occurs when a person is spun around or rotated rapidly, causing the fluid in the inner ear to be disturbed. This causes the eyes to jerk noticeably. This is also hard to see unless you are rotating along with the subject.(5)

Post-rotational nystagmus occurs

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when the person stops spinning. The fluid in the inner ear remains disturbed for a period of time and the eyes continue to jerk for a short period of time. This period is fairly short, and the jerking usually disappears within ten seconds.(5)

Both rotational and post-rotational nystagmus, due to the conditions under which they occur (subject rotating) will not interfere with the HGN test given by a police officer.(5) However, one defense attorney has attempted to suggest to a jury that since his client was involved in a traffic accident that spun his car around, that was the cause of the HGN observed by the police officer several minutes after the accident.

Caloric nystagmus occurs during a peculiar laboratory procedure when warm and cold water are simultaneously put into a person's opposing ear canals. The person is usually laying down when this happens. The procedure is frequently quite painful and it

often causes sickness to the point of vomiting.(8) Not what we usually see on the street, right? But hold on; don't be surprised if a defense attorney tells the jury that his client got out of his warm car during a storm and the wind blew cold rainwater into his ear and that caused the HGN!

Positional alcohol nystagmus (PAN) also occurs in the vestibular system. It is caused when a foreign fluid, such as alcohol, which alters the specific gravity of the blood, is in unequal concentrations in the blood and tire vestibular system. Air example of this is when a person consumes alcohol, lies down and feels that either he or the room he is in begins to spin.(5)

There are two types of positional alcohol nystagmus, PAN I and PAN II. PAN I occurs when the alcohol concentration in the blood is greater than the alcohol concentration in the inner ear fluid. In this case the BAC is generally rising and the room seems to be spinning around. PAN II is just the opposite. It occurs when the alcohol concentration in the inner ear is greater than the alcohol concentration in the blood. The BAC is generally going down and the person feels like he is spinning around while the room is stationary.(5,7)

Nystagmus can also result from neurological activity. This is our second category: neurological nystagmus. This category has several kinds of nystagmus.(5)

Optokinetic nystagmus occurs when the eyes fixate on an object that suddenly moves out of sight, or when the eyes view sharply contrasting images. Examples of optokinetic nystagmus: watching scenery while looking out the window of a moving train or fixating on a rapidly spinning wheel that has alternating black and white spokes.(5)

Obviously, optokinetic nystagmus will not be a factor if the HGN test is properly administered. During the HGN test a subject is required to focus

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on a stimulus that moves relatively slowly across his field of vision. However, keep our vigilant defense attorney in mind! Don't administer the HGN test if both you and the subject are on or near a moving train or there are any spinning wheels for him to look at.

Physiological nystagmus is a naturally occurring phenomenon that consists of very tiny jerks of the eye. This is done involuntarily and appears designed to keep the sensory cells of the eye from tiring. It happens to all of us, all the time. These jerks are generally too subtle to be seen with the naked eye. Because of this, physiological nystagmus will not impact on the HGN test.(5)

Gaze nystagmus occurs when a person's eyes move from the center position. There are three general types of gaze nystagmus.(5)

The first type is the one we are mainly concerned with, horizontal gaze nystagmus. This is the first and the most valid test of the standardized field sobriety test battery. This test has been validated as an accurate indicator of alcohol impairment by extensive scientific research. We can also

call HGN alcohol gaze nystagmus.(7,8,9)

Although the HGN is the most accurate test for determining alcohol influence, it may also indicate the use of high doses of other central nervous system depressants, PCP or certain inhalants.(7)

Vertical gaze nystagmus or vertical nystagmus occurs as the eyes gaze upward. This type of nystagmus is associated with PCP use or very high doses of alcohol or other Central Nervous System Depressants. All drugs which induce nystagmus will also induce vertical nystagmus if they are taken in high enough doses.(5,7)

The final type of gaze nystagmus is called resting nystagmus. This is when the eyes are observed to jerk even as they are looking straight ahead. This can indicate a high dose of PCP. However, this can occur naturally in some few persons, even when they are not under the influence of any drug at all. This condition is so acute that most of these people will tell you that they know they have "resting nystagmus", how long they have had it, and who their doctor is.

The third category (remember the first two are vestibular nystagmus and neurological nystagmus) of nystagmus is that caused by pathological disor-

ders. These include various kinds of brain tumors, other brain damage or some diseases of the inner ear. These are pathological (altered or caused by disease) or in some cases congenital (present at birth) disorders that occur in very few people and in even fewer drivers. Persons who suffer from these disorders are rarely able to drive. Be advised, however, this logic is not always recognized by defense attorneys. I had one claim on the date of trial (with six prior continuances) that he just that very minute found out that his client's doctor said that the client possibly had a brain tumor and that is obviously what caused the bad driving and HGN eight months ago. That got him continuance number seven.

Tracking ability can be affected by certain medical conditions or by certain injuries involving the brain. You can see if both eyes track equally (the same rate of movement, the same degree of movement, the two eyes move as one) by passing a stimulus across both eyes. If the two eyes do not track together, there is the possibility of a serious injury or medical condition. If you believe this is the case, of course you stop the test and summon medical help. Also, if one eye lags behind the other, or fails to move at all, there is the possibility of a neurological disorder. This also could indicate the presence of a glass eye.

Pupil size can be affected by some medical conditions or injuries. If the pupils are distinctly different in size, it could indicate one of several different things: a glass eye, head injury, or neurological disorder. Again, this is the time to ask the person if this is a normal condition for him; summon medical help if it seems necessary.

Now that we've covered the different categories and types or kinds of nystagmus we can concentrate on the HGN test itself. When we administer this test, we are looking for three specific clues of alcohol influence in each eye. We check each eye independently for each clue. For standardiza-

Nystagmus Terms at a Glance

Vestibular nystagmus: caused by movement or action in the vestibular system (inner ear); four kinds: rotational, post-rotational, caloric and positional alcohol

Rotational nystagmus: occurs when a person is spun around

Post-rotational nystagmus: occurs when a person stops spinning around

Caloric nystagmus: occurs when liquids of varying temperatures are put in opposing ear canals

Positional Alcohol Nystagmus: caused when alcohol alters the specific gravity of the blood versus the vestibular fluid

Neurological nystagmus: consisting of optokinetic, physiological and gaze nystagmus

Optokinetic nystagmus: occurs when eyes fixate on objects that suddenly move or when eyes view sharply contrasting images

Physiological nystagmus: naturally occurring to avoid eye strain; normally too subtle to observe

Gaze nystagmus: occurs when a person's eyes move from a center position; three types: horizontal, vertical and resting

tion, begin with the left eye. Check for each clue, one at a time, in each eye.

Remember that when you administer the HGN test, do so systematically; ensure that nothing is overlooked. We look for three "clues" in each eye. Lack of smooth pursuit, nystagmus at maximum deviation, and onset of nystagmus prior to 45°.

To begin, instruct the person to remove eyeglasses if applicable. Glasses may interfere with the subject's peripheral vision. They also may impede your ability to fully view the eyes. HGN is not a vision test. It doesn't matter whether or not the person can see the stimulus with perfect clarity, as long as he can see it well enough to track it as it moves. Also, always ask the person if he is wearing contacts, and stake a note of the answer. Generally speaking, contact lenses will not interfere with the HGN test. After this, have the person put feet together and hands at the sides. This is a position for the verbal instructions, while the person is in the position, note any sway, wobble, loss of balance, etc.

While the subject is still in this position, give the appropriate verbal instructions: keep the head still, focus the eyes on the stimulus, follow the stimulus with the eyes only. After explaining the test, ask the person if he understands the instructions. Does he have any questions? Once the person indicates that he understands what he is supposed to do you can begin the test.

Test Procedures:

Position the stimulus approximately 15 inches in front of the subject's nose and slightly above eye level (to "open up the eye" and make movement of the eyeball easier to see).

Make several side to side passes with the stimulus, check for equal tracking.

Check for equal pupil size.

Check the left eye for "lack of smooth pursuit." Make at least two

complete passes in front of the eye, smoothly and at a pace of about 2 seconds for the eye to move from gazing straight ahead to its maximum deviation to the side. If the eye is observed to jerk that is one clue. This jerking must be definite and distinct in order to score this clue.

Check the right eye for "lack of smooth pursuit" clue in the same manner.

Check the left eye for "nystagmus at maximum deviation" clue. Smoothly move the stimulus to the side until the eye has gone as far in the socket as possible. Hold the stimulus there for 4 seconds and watch the eye for any definite jerkiness. If this is present, score one clue.

Check the right eye for "nystagmus at maximum deviation" clue in the same manner.

Check the left eye for the "angle of onset prior to 45°" clue. Move the stimulus slowly (at a speed of four seconds for the stimulus to reach the person's shoulder) to mark the point at which the eye begins to jerk. This is called the point of onset. Generally speaking, the earlier the onset, the higher the BAC. When you think you have reached the point of onset, stop moving the stimulus and hold it at that position. The eye should continue to jerk. Compare the point of onset with 45°. There are three indicators that can be used to determine this angle.

If you start out with the stimulus about 15 inches directly in front of the nose and move it 15 inches to the side, you will have reached a 45° angle.

At 45° some white will usually be still visible in the corner of the eye for most people.

If you start with the stimulus about 15 inches in front of the person and move it to a position where it is lined up with, or slightly beyond the edge of the shoulder, the angle will be approximately 45°.

Check the right eye for the "angle of onset prior to 45°" clue in the same manner

Total the clues: Maximum number for each eye is three. Maximum total for both eyes is six.

Check for vertical nystagmus.

Score the test. If a person exhibits at least four out of a total of six possible clues the implication is that he has a BAC of at least 10% or higher. This has been documented by extensive research which indicates that the test is 77% reliable.(11)

As we've seen, HGN, properly administered, is a powerful tool in developing probable cause to make a DUI arrest. The test itself only takes about 30 seconds to administer. The flip side of this is the fact that you can easily spend about two or more hours on the witness stand giving testimony about it. answers for direct examination.

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