Field Sobriety Tests Review

A Quick Reference Guide for Prosecutors & Law Enforcement on What They Should Know About the Standardized Field Sobriety Tests

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INTRODUCTION

Like you, I am passionate about holding drivers accountable for their choice to drive under the influence of alcohol and other drugs. Impaired driving cases are among the most difficult a patrol officer or a misdemeanor prosecutor will handle, particularly early in their careers. Defense attorneys routinely take advantage of this. Additionally, popular culture has raised the burden of proof in all types of criminal cases. Jurors may expect to be presented with "scientific" evidence even where none should be expected to exist. My hope is prosecutors and officers will use this outline to prepare for court and then better explain the SFST evidence to jurors.

Back to the Basics

The focus of an impaired driving case can take a wrong turn when it becomes all about the officer's performance and/or knowledge of the standardized field sobriety tests (SFSTs). The defendant's impairment and decision to drive must remain our focus. Defense counsel will always put officers on trial for their execution of SFSTs, but there are things we can do as officers and prosecutors to keep our trials on the correct path. I learned by watching Saturday morning cartoons that "Knowledge is Power!" We keep our trials on the right path by proactively educating ourselves in the science and the law and then present our information in a manner that will be remembered and believed by the finders of fact. This purpose of this guide is to provide the necessary knowledge.

Review of the Field Sobriety Tests

The current edition of NHTSA's Standardized Field Sobriety Testing Manual was published May 2013. This review was created using this updated manual. If you have not attended a refresher course, my suggestion is to do it now. If you have been using my older versions of the "Field Sobriety Tests Review" please disregard those documents and replace them with this version.

The Texas District & County Attorneys Association has done all of the heavy lifting for me and has graciously granted permission to reprint their materials. I have taken their original work and updated it to coincide with the updated NHTSA manuals. TDCAA material is copyright protected, as is IPAA material. My thanks to Texas prosecutors Clay Abbott and Warren Diepraam, who originally authored much of this document and made it available to law enforcement and prosecutors across the country! Please visit www.tdcaa.com for more of their excellent impaired driving resources. I also want to thank Deena Ryerson, Oregon's Traffic Safety Resource Prosecutor, for her many contributions to this review. Deena spent many hours reviewing the May 2013 NHTSA SFST Manuals and providing her expertise.

Wait . . . We Better Start with Mom

Before we delve into the Standardized Field Sobriety Tests, let's not forget *Mom's Field Sobriety Tests*. Clay Abbott explains that all jurors had mothers, just like yours. Like you, your jurors' mothers likely conducted their own field sobriety tests when your jurors were teenagers coming home late at night, just like Clay's mom did. In Clay's words:

> My mother made me wake her up and give her a hug; then she asked me silly questions about my night, all while smelling my breath for alcohol, scanning for bloodshot eyes, and checking my ability to converse with all my faculties.
>
> Mom's sobriety tests – while not as well researched, tested and verified as the SFSTs – are far better accepted by and understandable to the average juror. So before officers on the stand ever get to SFSTs, they must fully explain they conducted Mom's sobriety tests on the defendant too. This is where impaired driving cases are won. While defense counsel will always put officers on trial for their execution of SFSTs, the defendant remains the focus of Mom's sobriety tests.
>
> Nothing in a DUI investigation is as important as this first contact and conversation you have with the defendant. Don't rush it. Spend as much energy developing this set of skills and techniques as you do any other. ****Reprinted from "The Prosecutor" (Vol. 38, No. 3, 2008) a publication of the TDCAA with permission of the author.* **CLICK HERE** to read the full article.

The importance of "Mom's sobriety tests" cannot be overstated. They are observations everyone can relate to, as opposed to the SFSTs some jurors think they "couldn't do sober." SFSTs are not to be discounted, of course. But when analyzing them and presenting them at trial, focus should be on common place observations, as opposed to "clues" and "points."

Why is a field sobriety test important to driving? Not because the driver cannot stand on one leg for thirty seconds without putting their foot down or raising their arms. They are important because they are divided attention activities. *What is driving?* A divided attention activity! If a driver cannot follow simple instructions and maintain attention to the relatively easy task at hand, then how can they expect to maintain attention to the more difficult task of driving a 2,000-pound car?

This Field Sobriety Test Review becomes powerful only when the research is understood and the training is applied in the field and later demonstrated in the courtroom to draw a simple visual picture of a very dangerous impaired driver who needs to be held accountable. Let's get started!

FIELD SOBRIETY TEST REVIEW[1]

This review includes hyperlinks to original sources, additional studies and other materials. Clicking on any of the text in **blue** will take you directly to the materials. For example, clicking on the blue can download the entire May 2013 NHTSA **Instructor** & **Participant** manuals. Of course, you must have Internet access for these links to work. Please feel free to contact me at jared.olson@post.idaho.gov if you have any problems accessing the materials.

In addition, the review is organized in the same manner the Standardized Field Sobriety Tests are conducted. The review begins with Horizontal Gaze Nystagmus, followed by Walk and Turn and finally the One-Leg Stand. The document concludes with an overall summary of the field sobriety tests. Let's begin . . .

Horizontal Gaze Nystagmus (HGN)

Nystagmus is a jerking of the eye or a bouncing eye motion caused by multiple factors. It is displayed in either pendular form where the eye oscillates equally in two directions or jerk form where the eye moves slowly away from a fixated point and then rapidly corrects by a fast movement or saccade. Horizontal Gaze Nystagmus (HGN) is a form of jerk nystagmus where the saccadic movement is towards the direction of the gaze. HGN is an involuntary motion that is not controlled by the individual.

Basically, HGN is a visible physiological sign of impairment like slurred speech or staggered gait. Officers frequently use the HGN test and looks for the following six clues (or three in each eye):

- Lack of smooth pursuit
- Distinct and sustained nystagmus at maximum deviation
- Onset of nystagmus prior to 45 degrees

These signs do not result from problems with the eye muscles directly. Rather, the brain and nerve centers that control the eye muscles are affected by alcohol, other central nervous system depressants, inhalants or dissociative anesthetics, such as phencyclidine (PCP) or its analogs. The signs appear in the order of testing as the level of impairment increases. These eye movements clues are not subject to control, practice or tolerance, making the HGN test a very valuable evidentiary tool.[1]

Based on recent research, if the subject exhibits **four or more** clues on this test they are impaired at or above 0.08. Using this criterion, officers were able to accurately classify 88% of the subjects, with no other clues considered from other SFSTs.

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Categories of Nystagmus

There are more than 40 possible types of nystagmus, known and documented. A quick online search will reveal great discussion among the defense community regarding this fact. The bottom line is, "No conditions other than impairment with alcohol and other specific drugs will produce exactly the types of eye movements associated with such impairment when assessed with the HGN and VGN tests. A properly trained police officer will know how to distinguish such eye movements."[2]

This review discusses some of the most common types of nystagmus that have been compared to HGN. It is important to note many of the following types of nystagmus will be present either when the subject views straight ahead or under conditions inconsistent with the HGN and VGN test procedures.[3] Becoming familiar and conversant on these various categories will improve your credibility with the judge and/or jury.

Vestibular System Nystagmus

The vestibular system is the system of fluid-filled canals located in the inner ear that assists in balance, coordination and orientation. Positional Alcohol Nystagmus, discussed below is a form of vestibular system nystagmus. However, there are a number of non-alcohol related vestibular system nystagmuses. *See* NHTSA SFST Participant Manual Session 8 – page 12 of 62.

1. ***Rotational*:** Nystagmus occurs when an individual is spun around rapidly causing the fluid in the inner ear to be disturbed. This cannot happen at roadside. *Only occurs while person is spinning.*

2. ***Post Rotational*:** Nystagmus is present when an individual stops spinning because the fluid in the inner ear remains disturbed for a period of time. *This type of nystagmus only lasts for a few seconds, is more prevalent in one eye, and would not be present for entire duration of the HGN test.*

   Note: Neither rotational nor post rotational nystagmus will interfere with the Horizontal Gaze Nystagmus test because of the conditions under which they occur. *See* NHTSA SFST Participant Manual Session 8 – page 12 of 62.

3. ***Caloric*:** Nystagmus is caused by movement of inner ear fluid due to a difference in temperature of the fluid between the left and right ear. *This occurs by putting warm water in one ear and cold water in the other. This is not a roadside practice of law enforcement.* Caloric nystagmus will not occur due to "swimmer's ear" nor driving with your car window open on a cold night, with the heater on inside. *See* "HGN and the Role of the Optometrist," by Karl Citek, OD, PhD, FAAO, in Admissibility of Horizontal Gaze Nystagmus Evidence, NDAA 2003 – Page 19.

Positional Alcohol Nystagmus

Nystagmus occurs when a foreign fluid, such as alcohol, alters the specific gravity of the blood in unequal concentrations in the blood and the vestibular system. If the subject's head is uneven and they have this fluid inequity, this type of nystagmus may occur. For this reason, the head is held straight (note that the person can be standing, seated, or supine for the HGN test).

You will ALMOST NEVER see Positional Alcohol Nystagmus in the field. The only way you will is if the defendant is lying down on a backboard and you turn his head to the side. The action of turning the head will induce Positional Alcohol Nystagmus. See NHTSA SFST Participant Manual Session 8 – page 13 of 62.

Note: In the original HGN study, research was not conducted for performing HGN on people lying down. Current research demonstrates that HGN can be performed on someone in this position. *Also see the "Sleep Deprivation Does Not Mimic Alcohol Intoxication on Field Sobriety Testing" study.*

Nystagmus Caused by Neural Activity

Nystagmus (which should be distinguished from gaze nystagmus) can also result from neural activity:

- **Optokinetic Nystagmus:** Occurs when the eyes fixate on an object that suddenly moves out of sight or when they watch sharply contrasting moving images such as watching scenery from a moving vehicle or watching a train go by while parked at a crossing, etc. *This type of nystagmus only lasts as long as it takes for the object to stop moving or for the person to stop looking at the moving object.* You can avoid this by facing subject away from moving traffic and turning off your overheads (or also facing subject away from overheads and traffic). *You can also be certain it is not Optokinetic when the subject's eyes converge and is focused on your stylus. The movement of the stimulus and the fixation on the stimulus by the subject precludes this form of nystagmus from being observed by the officer. See* NHTSA SFST Participant Manual Session 8 – page 13 of 62.

- **Epileptic Nystagmus:** occurs during epileptic or other type of seizures, which are easily detectable at scene!

- **Physiological Nystagmus:** Is a natural nystagmus that keeps the sensory cells of the eye from tiring. It is the most common type of nystagmus. It occurs in all of us all the time. It causes extremely minor tremors or jerks in the eyes, *but these are generally too small to be seen with the naked eye and if visible, not sustained if proper HGN procedures are followed. See* NHTSA SFST Participant Manual Session 8 – page 14 of 62.

Gaze Nystagmus

Nystagmus occurs as the eyes move from the center position. It is separated into three types. *See* NHTSA SFST Participant Manual Session 8 – pages 14 thru 16 of 62.

1. ***Horizontal Gaze Nystagmus (HGN)*:** occurs as the eyes move side to side. (Click Here)

2. ***Vertical Nystagmus (VGN)*:** up and down jerking of the eyes as they are held in the upmost position. The presence of VGN May indicate a high dose for that individual and will not be present without HGN. (Click Here)

3. ***Resting Nystagmus*:** is referred to as jerking as the eyes look straight ahead and is indicative of a pathological condition or the influence of PCP. (Click Here)

Nystagmus Caused by Certain Pathological Disorders

They include brain tumors and other brain damage or some diseases of the inner ear. These disorders occur in very few people and in even fewer drivers. Many of these causes are so severe that it is unlikely that a person afflicted with the disorder would be driving (and if they do have it, notify the medical board of ITD Driver Services). *These types of nystagmus tend to be pendular rather than jerk nystagmus. See* NHTSA SFST Participant Manual Session 8 – page 16 of 62.

Medical Impairment

It is important to distinguish between the entire HGN test, with any single indicator of possible medical impairment the officer may witness while conducting certain aspects of the standardized HGN test. The examinations the officer conducts to assess possible medical impairment include: (1) equal pupil size; (2) resting nystagmus; and (3) equal tracking. For example, if the two pupils are distinctly different in size, it is possible the person may have a medical condition or maybe a prosthetic eye. In addition, if the two eyes do not track together, there is a possibility of a serious medical condition or injury. Medical personnel should be contacted and the officer should ask questions about head trauma. *See* NHTSA SFST Participant Manual Session 8 – page 17 & 18 of 62.

Congenital Nystagmus

About 1 person in 200 has congenital nystagmus, which presents at birth or shortly thereafter. Similarly, nystagmus may accompany certain congenital conditions such as *albinism*, which is identified by the lack of skin and hair pigmentation. In all

congenital conditions, and depending on the individual, the nystagmus may be constant, only at certain times (for example, when looking close up or when fatigued), or it may change appearance with the viewing direction (for example, more pronounced when looking right and diminished when looking left. *See* "HGN and the Role of the Optometrist," Karl Citek, in Admissibility of HGN Evidence, p. 18.

Natural Nystagmus

A very small number of people exhibit a visible natural nystagmus. The number is so small according to Dr. Burns, who many NHTSA studies and who has been in the field for over 30 years. She states that she can count total number of individuals with this condition on her hands. Visible nystagmus is evident only at particular angles of gaze, but not before or beyond that point. During the test for HGN you are looking not only for nystagmus at a particular angle of gaze, but smooth pursuit and end point nystagmus as well.[4]

In addition, people who have natural nystagmus will know they have it and will most likely tell the officer before the test is administered. *See HGN: The Science and the Law, pages 25-26.*

Fatigue Nystagmus

Fatigue or endpoint nystagmus is caused by holding the eye at maximum deviation for 30 seconds or longer. It has nothing to do with being tired and fatigue does not cause nystagmus. The instructions refer to the stylus being held at maximum deviation for a minimum of four seconds. As long as the officer does not hold the stimulus at maximum deviation for thirty seconds, there will be no fatigue nystagmus. *See* NHTSA SFST Participant Manual Session 8 – page 31 of 62.

The defense may claim the defendant was fatigued for lack of sleep, and this fatigue caused nystagmus. According to Dr. Burns, fatigue has no effect. This finding was validated by a 1981 NHTSA study that showed fatigue had no significant effects on the manifestation of HGN. There is a 2001 study that suggests lack of sleep may exaggerate endpoint nystagmus,[5] but no other studies are known to prove that sleeplessness or systemic fatigue affect any other eye movements. The key is to not confuse fatigue with "fatigue nystagmus," which is created if the eye is held at maximum deviation for 30 or more seconds.[6]

Conclusion -- Various Types of Nystagmus: A search of the Internet will reveal over 40 different types of nystagmus, but they are different from Horizontal Gaze Nystagmus (HGN). For example, caffeine or nicotine has been argued to cause HGN, which is untrue. Caffeine and nicotine are stimulants. Stimulants do not create or make HGN visible to the naked eye. There is no evidence that smoke causes HGN. In addition to stimulants mentioned above, none of the following drug types create HGN: cannabis, hallucinogens or narcotic analgesics.

Things You Should Know About HGN

1. Officers are trained to administer the HGN test using a systematic 10-step process. Deviation from the 10-step process does not affect the validity of the test. However, it is good practice to always systematically follow the 10-steps to make sure no step is overlooked so no evidence is missed. *See* NHTSA SFST Participant Manual Session 8 – pages 21-25 of 62.

2. The first step is to check if the subject is wearing eyeglasses. Eyeglasses are removed so the officer may have a better view of the subject's eyes. Nystagmus is not a vision test. Therefore, it does not matter whether the subject can see the stimulus with perfect clarity, as this will not produce the clues associated with alcohol impairment. The reason eyeglasses are removed is they may impede the subject's peripheral vision, and may also impede the officer's ability to observe the eye carefully. In short, the eyeglasses may get in the way of the officer being able to observe the clues. *See* NHTSA SFST Participant Manual Session 8 – page 21 of 62; and NHTSA SFST Instructor Manual Session 8 – page 8-34.

3. In addition to the questions asked of the subject, the first 2 passes of the test check for medical impairments: tracking ability and pupil size. If the eyes do not track together or the 2 pupils are of distinctively different size, these are signs of possible medical impairments. Medical personnel should be contacted and the subject should be asked more about head trauma. *See* NHTSA SFST Participant Manual Session 8 – page 17 & 18 of 62.

4. Always ask subject if he/she has any medical conditions and have the subject explain the conditions. It is beneficial to ask about treatment plans for the condition and symptoms.

5. **Resting Nystagmus:** If resting nystagmus is observed the officer should continue with the remainder of the test to check for other possible indicators of impairment and any possible indicators of medical conditions. *See* NHTSA SFST Instructor Manual Session 8 – page 8-36.

6. **Always start with the subject's left eye.** This is the standardized test. Although it makes no scientific difference, this is the way the test is written and should be performed. While it would not invalidate the result, it would add confusion for the fact finder and possible impeachment for the officer. Stimulus is held **12-15 inches** in front of subject's nose and slightly higher than the level of his/her eyes. This slight elevation results in the eyes being open wider, which makes it easier to see the nystagmus. Deviations from the instructions are discouraged because these are NHTSA guidelines, but do not affect the validity of the test. They are simply guidelines for ease of viewing and comfort of the subject.

7. **Smooth Pursuit:** 2 passes for each eye. It should take approximately 2 seconds to bring the eye from center to side *and 4 seconds across the body*. The time suggestion is required by NHTSA because it is an effective amount of time for the tester to view the required nystagmus. Defense counsel will attack speeding up the process, but in reality the officer is missing clues not inducing a nystagmus. *See* NHTSA SFST Participant Manual Session 8 – pages 27 & 28 of 62.

8. **Equal Tracking:** The speed of the stimulus should be approximately the same speed used as checking for the lack of smooth pursuit. There should be a clear, distinguishable break between the check for equal tracking and lack of smooth pursuit. Equal tracking can be performed once or twice. *See* NHTSA SFST Instructor Manual Session 8 – 8-36.

9. **Distinct and Sustained Nystagmus at Maximum Deviation:** Take eye out until it has gone as far as possible. No white showing. Hold for a minimum of 4 seconds. Unless a valid reason can be articulated, do not hold at maximum deviation for longer than ten seconds. Again holding over 10 seconds, but less than 30 does not effect the validity, officers should follow the standardized performance. Holding the stimulus for longer than 30 seconds can induce fatigue nystagmus. Repeat the procedure. *See* NHTSA SFST Participant Manual Session 8 – pages 30 & 31 of 62.

10. **Onset Prior to 45 Degrees:** You will reach 45-degrees when you have moved the stimulus about 15 inches to the side, if you held the stimulus 15 inches from subject's nose (or if stimulus is 12 inches from the nose, move it 12 inches to the side). Two indicators to determine this angle are: at 45 degrees, some white usually will be visible in the corner of the eye and you will be lined up or slightly beyond the edge of the subject's shoulder (except when subject is either a very large or very small person). Move stimulus slowly, should take 4 seconds to reach the edge of shoulder. When you think you see jerking, stop moving stylus and hold it steady at that position *to verify that the nystagmus is distinct and sustained*. When you locate the onset of nystagmus, verify it is prior to 45-degrees (white showing and before edge of subject's shoulder). Repeat the procedure. *See* NHTSA SFST Participant Manual Session 8 – pages 31-35 of 62.

11. The clues are cumulative. Nystagmus at maximum deviation should not be observed without observation of lack of smooth pursuit and onset prior to 45 degrees should not be observed without observing both lack of smooth pursuit or nystagmus at maximum deviation.

    It is possible for all 3 clues to be found in one eye, while only two (or sometimes only one) will show up in the other eye. It is always necessary to check both eyes and to check them independently. Notwithstanding, it is

unlikely the eyes of a person under the influence of alcohol will behave totally different. Consider a pathological disorder if one eye is showing three clues and the other eye is showing none. *See* NHTSA SFST Participant Manual Session 8 – page 25 of 62.

12. The implication is BAC above 0.08 if the officer observes 4 or more clues. This **test is 88% accurate in and of itself** when done according to NHTSA guidelines by trained and experienced officers. This means no reliance on other corroborating evidence of impairment such as smell of alcohol, slurred speech or reliance on clues observed using the Walk & Turn or One Leg Stand sobriety tests!!!

13. Defense attorney's will try to commit you to 77% accuracy based on the first validation study, but keep in mind this study was done in the lab, in the 1970s, with untrained officers. The updated 2013 NHTSA SFST manual emphasizes officers and prosecutors should be relying on the most recent study conducted in 1998 in San Diego by experienced officers. Furthermore, the San Diego study identified validity of SFSTs for both 0.08 and 0.04 BACs. *See* NHTSA SFST Participant Manual Session 8 – pages 7-10 of 62.

14. This 88% figure does not mean 12% of the individuals studied were not intoxicated (and therefore would have been arrested wrongfully). Rather the studies revealed that officers failed to detect clues and released intoxicated drivers (according to Dr. Burns, this is the most common error of police: giving the subject the benefit of the doubt and releasing too many intoxicated drivers). Even if relying on the 77% figure, the above analysis still applies.

Comparison of SFST Accuracies 1981 vs. 1998

Study: Combined Tharp, Burns, & Moskowitz (1981)

BAC: 0.10
HGN: 77%
WAT: 68%
OLS: 65%
Combined: 81%

Study: Stuster & Burns (1998)

BAC: 0.08
HGN: 88%
WAT: 79%
OLS: 83%
Combined: 91%

The greater component and overall accuracies found during the 1998 study are attributable to greater law enforcement experience with the SFSTs since the original study and a lower criterion BAC than in the original study (i.e., 0.08 vs. 0.10 percent).

Click here *to also see the discussion below regarding correct arrest decisions when combining all three standardized field sobriety tests (HGN, Walk & Turn, One Leg Stand).*

15. Additionally, simply because a person's BAC is below a 0.08 does not mean the individual is not impaired or maintains their normal use of mental or physical faculties. Most subjects in laboratory studies are significantly impaired regarding visual acuity, vigilance, drowsiness, psychomotor skills and information processing by the time they reach 0.05 BAC.[7] Based on decades of research, there is scientific consensus that alcohol causes deterioration of driving skills beginning at 0.05 BAC or even lower.

16. National and international traffic safety and public health organizations, including the American Medical Association (AMA 2013), the World Health Organization (WHO 2013a), the World Medical Association (WMA 2013), and the Association for the Advancement of Automotive Medicine (AAAM 2009) and the National Transit Safety Board (NTSB 2013) have advocated setting BAC limits at 0.05 or lower.

    The AMA has called for per se BAC limit of 0.04 for more than two decades, explaining this is the limit where all individuals are measurably impaired. More than 100 countries have already established per se BAC limits at or below 0.05. *See Alcohol and the Driver, The Journal of the American Medical Association, 1986: 255(4): 522-527.*

17. All people have nystagmus, it's just not visible by the naked eye, except in extremely limited circumstances. *See HGN: The Science and the Law, pages 25-26.*

18. **Remember: Only 4 things are known to cause Horizontal Gaze Nystagmus:** (1) Depressants (such as alcohol, Xanax, Valium and so forth); (2) Inhalants (i.e. glues, gasoline, spray paint, "whippets"); (3) Dissociative Anesthetics (i.e. PCP and it analogs, Ketamine, etc.); and (4) Serious Brain Stem Injury. *See* NHTSA SFST Instructor Manual Session 8 – page 8-18.

19. The American Optometric Association passed **Resolution 1901** on June 20, 1993 stating, "that the American Optometric Association acknowledges the scientific validity and reliability of the HGN test as a field sobriety test when administrated by properly trained and certified police officers and when used in combination with other evidence…" This resolution is reviewed every 5 years. *See 2001, 2006 and 2011.*

20. It is estimated that about 1 person in 2,000, when sober and in absence of drugs or known medical conditions, show signs that an officer could associate with alcohol impairment. However, experienced officers will recognize the quality of eye movements is not consistent with those he/she normally observes on impaired subjects. In addition, there is typically other evidence such as slurred speech, bloodshot eyes, lack of balance, inappropriate attitude or behavior, and so forth, that would be absent if the person were sober. *See* Admissibility of Horizontal Gaze Nystagmus Evidence, NDAA 2003 – Pages 19-20.

21. **Vertical Gaze Nystagmus (VGN):** This test reveals whether or not the tested individual has ingested a high dose, for that individual. An up and down jerking of the eyeball is indicative of the presence of VGN. Position the stimulus in a horizontal position approximately 12-15 inches from the subject's nose, tell the subject to hold the head still and follow with the eyes only, raise the stimulus until the eyes are elevated as high as possible, and hold for *a minimum of 4 seconds* to look for jerking. *See* NHTSA SFST Participant Manual Session 8 – page 39 of 62.

    The VGN test was not part of the original study. *See* NHTSA SFST Instructor Manual Session 8 – page 8-64.

22. Each state may have unique legal issues and case law regarding the admissibility of HGN evidence. The National Traffic Law Center has summarized each state's case law under the following three issues: evidentiary admissibility, police officer testimony, and purpose and limits of the HGN test results. **Click Here** to access the most recent "NTLC Horizontal Gaze Nystagmus State Case Law Summary."

Idaho HGN Cases

23. HGN test results are admissible under Idaho Rules of Evidence. Rule 702 is the correct test in determining the admissibility of HGN. *State v. Gleason*, 123 Idaho 62 (1992).

24. Officer may testify as to administration of HGN test, but not correlation of HGN and BAC. *State v. Garrett*, 119 Idaho 878 (1991). Example: Officer cannot say, "I saw bouncing of the eyes prior to a 45 degree angle, therefore the defendant was above a .08 BAC." This statement is likely to cause a mistrial.

25. Remember, HGN may be "admitted for the same purpose as other field sobriety test evidence – a physical act on the part of defendant observed by the officer contributing to the cumulative portrait of defendant intimating intoxication in the officer's opinion." *Gleason* at 66.

Walk and Turn (WAT)

The Walk and Turn is a field sobriety test based on the important concept of divided attention. The test requires the subject to divide attention among mental tasks and physical tasks. The person is mentally tasked with comprehending verbal instructions, processing the information and recalling it from memory. The person is physically tasked with maintaining balance and coordination while simply standing still, walking and turning.

There are eight scored clues:

- Cannot keep balance while listening to the instructions
- Starts too soon
- Stops while walking
- Does not touch heel-to-toe (by more than ½ inch while walking)
- Steps off line
- Uses arms to balance (raises 6 inches or more)
- Improper Turn
- Incorrect number of steps

Based on recent research, if the subject exhibits **two or more** clues on this test, **or fails to complete it**, they are impaired at or above 0.08. Using this criterion, officers were able to accurately classify 79% of the subjects, with no other clues considered from other SFSTs.

If the subject cannot perform the test, or fails to complete it, make sure to document this fact, and *list only the clues* you were able to see. Also document the reason for not completing the test – i.e. the subject's safety due to their obvious intoxication.

List all other observations indicating impairment but are not counted as clues. For example if the subject fails to count steps out loud as instructed, sways or uses arms to balance while listening to instructions but subject's feet never breaks apart, takes the correct 9 steps but verbally counts 10, walks very slowly but does not stop, and so forth.

Things You Should Know About the Walk and Turn

1. Like all divided attention tests, the Walk and Turn has two stages: (1) instructions stage, and (2) walking stage. Do not overlook the importance of either stage. Too often, I have seen officers speak too quickly or rush through the instructions, which can affect the weight of the evidence during the walking stage.

2. **Test Conditions:** Whenever possible this test should be conducted on a reasonably dry, hard, level, non-slippery surface. There should be sufficient

room for subjects to complete 9 heel-to-toe steps. The language requiring a designated straight line was removed from the 2013 NHTSA SFST manuals.

It is commonly argued the original studies were conducted and validated in a controlled laboratory environment and therefore the tests are not validated for roadside. Remember, the recent field validation studies have indicated that varying environmental conditions have not affected a subject's ability to perform this test. *See* NHTSA SFST Participant Manual Session 8 – page 41.

3. Original research for walk and turn suggested subjects older than 65 years of age or those with back, leg, or inner ear problems had difficulty performing this test. However, less than 1.5% of the test subjects in the original studies were over 65 years of age. Therefore, there was not a statistically significant group to draw a good conclusion. Remember, it may be argued the test is not "validated" for subjects older than 65, but this does not mean the test is not "valid" in showing evidence of impairment. Officers should consider age, environmental factors, location, injury or physical ailments while administering the tests. The importance of the totality of all factors should never be overlooked. *See* NHTSA SFST Participant Manual Session 8 – p. 41.

   It is a misperception that the subject's weight invalidates the Walk and Turn test. Rather, weight is an issue explored in regards to the One Leg Stand test. Nevertheless, weight can be one more factor for the officer to consider under the totality of the circumstances. The Walk and Turn test can still be conducted if safe for the officer and the subject.

4. The subject's footwear, or lack thereof, often becomes a source of contention when assessing the walking stage of the test in court. The manual suggests the officer give individuals wearing heels more than 2 inches high an opportunity to remove their shoes. However, subjects with any form of unusual footwear (flip flops, platform shoes, etc.) should be given the opportunity to remove the footwear prior to the test. Officers should ask the subject some probing questions regarding their unusual footwear to help in considering the totality of the circumstances (i.e., How often do you wear those shoes? Are they comfortable to walk in? Do you think you will do better wearing or not wearing them during this test?) *See* NHTSA SFST Participant Manual Session 8 – pages 41 of 62.

5. The preface found in previous manuals was especially helpful when facing defense challenges to the various environment condition challenges to the Walk and Turn. The preface was inadvertently removed from the 2013 NHTSA Participant Manual. I am told it will be re-inserted in future updates. However, it can still be found in the 2013 NHTSA Instructor Manual's **"DUI Detection and Standardized Field Sobriety Testing – Administrator's Guide"** preface, which states:

The procedures outlined in this manual describe how the Standardized Field Sobriety Tests (SFSTs) are to be administered under ideal conditions. We recognize that the SFSTs will not always be administered under ideal conditions in the field, because such conditions will not always exist. Even when administered under less than ideal conditions, they will serve as useful indicators of impairment. Slight variations from the ideal, i.e., the inability to find a perfectly smooth surface at roadside, do not necessarily make the SFSTs invalid. (emphasis added.)

Keep this preface handy when testifying!

6. Safety Precautions in administering the test was added to the 2013 NHTSA Manual. Officers and prosecutors should be aware of this addition, in case the defense tries to argue these precautions are standardized and failure to follow them somehow invalidates the test. These safety precautions include:

    - Keep subject on the left side during demonstrations
    - Never turn back on subject
    - Be aware of surroundings
    - Left-handed officers should demonstrate test at a distance more than arm's length.

    These precautions are exactly what they purport to be – Safety Precautions! Not actions that somehow affect the validity of the administration of the test if not followed. *See* NHTSA SFST Participant Manual Session 8 – pages 41 of 62.

    FYI – The left-handed officer safety precaution is not included in the instructor manual and accompanying classroom PowerPoint slide. *See* NHTSA SFST Instructor Manual Session 8 – pages 8-68.

7. Officers, during your demonstration of the Walk and Turn – **DO NOT STOP** – this includes before, during and after the turn. If you demonstrate a stop and later count "stops while walking" as a clue, the defense will claim in court their client was merely doing the test the way you demonstrated it. So either do not stop while demonstrating, or make the statement during your instructions that you are stopping to instruct the next portion of the test, but the subject should not stop when they perform the test.

8. **Test Performance – Improper Turn Clarification:** "There may be times when the suspect takes a wrong number of steps or begins the heel-to-toe walk with the wrong foot resulting in a turn on the right foot instead of the left. If this occurs the suspect would normally be assessed a clue for an incorrect number of steps and not assessed a clue for an improper turn if the

turn was made using a series of small steps as instructed and the suspect did not lose his/her balance while attempting the turn. This scoring is consistent with the original research and training conducted by the Southern California Research Institute and with the administration and scoring of the Walk and Turn test in the San Diego Field Study." (emphasis added.) *See* NHTSA SFST Instructor Manual Session 8 – pages 8-74.

9. Remember, the SFSTs are tools to assist you in seeing visible signs of impairment and are not a pass/fail test. *See* NHTSA SFST Participant Manual Session 8 – page 46 of 62.

   Note: Idaho courts have consistently used the terms "pass" and "fail" in written decisions. Some Idaho prosecutors recommend using the terms "pass" and/or "fail" in emphasizing the evidence observed while others do not. In most other states, the overwhelming recommendation is to not use the terms "pass" or "fail" in relation to the SFSTs. This is certainly consistent with the recommendations in the NHTSA manual.

   The terminology recommendations in referring to the scored observations, is simply refer to them as "clues" of impairment or even "validated clues," based on the research studies.

10. Based on the 1989 San Diego Study, if the subject exhibits two or more clues on this test, or fails to complete it, the indication is the subject is at or above 0.08. The San Diego Study found officer's arrest decisions were **79% accurate, in and of itself,** without considering any other clues or indicators of impairment. *See* NHTSA SFST Participant Manual Session 8 – page 47 of 62.

    Also see "Correct Arrest Decision" below in Quick Review.

    Note: In Idaho, officers should never testify in court about the correlation between the Walk and Turn and BAC. Example: "I scored two or more clues on the Walk and Turn, therefore the defendant was likely above a 0.08 BAC based on the San Diego Study." This statement is likely to cause a mistrial. *See State v. Garrett*, 119 Idaho 878 (1991) (officers not allowed to testify about the correlation between HGN and BAC level).

One Leg Stand (OLS)

The One Leg Stand (OLS) is another field sobriety test based on the important concept of divided attention. The test requires the subject to divide attention among mental tasks and physical tasks. The subject's attention is divided among such simple tasks as balancing, listening and counting out loud for a set amount of time (30 seconds). None of these mental and physical tasks are particularly difficult on their own, but the combination can be very difficult for an impaired individual to do for more than 25 seconds.

There are four clues on this test:

- Sways while balancing
- Uses arms to balance (Moves arms 6 inches from side)
- Hopping
- Puts foot down.

Based on recent research, if the subject exhibits **two or more** clues on this test, **or fails to complete it**, this person is impaired at or above 0.08. Using this criterion, officers were able to accurately classify 83% of the people they tested, with no other clues considered from other SFSTs.

If the subject cannot perform the test, or fails to complete it, make sure to document this fact, and *list only the clues* you were able to see. Also document the reason for not completing the test – i.e. the person's safety due to his/her obvious intoxication.

List all other observations indicating impairment but are not counted as clues. For example if the subject did not hold his/her foot parallel to the ground or verbally miscounting 30 seconds.

Things You Should Know About the One Leg Stand (OLS)

1. Like all divided attention tests, the One Leg Stand has two stages: (1) instructions stage, and (2) balance and counting stage. Do not overlook the importance of either stage. As discussed with the Walk and Turn, do not rush the instructions, which can be a tendency when officers become extremely familiar to the administration of the instructions through repetition.

2. It is "One Leg Stand" not "One Legged Stand." Failure to use the correct terminology can potentially harm your credibility with judge, jurors and/or others.

3. **Test Conditions:** The One Leg Stand requires a reasonably dry, hard, level and non-slippery surface. The person's safety is always an important consideration when administering this test.

The 2013 SFST Manual added an explanation to the removal of a previous test condition. In the original research study, the recommendation was if the test could not be performed on the above described surface, the subject could be asked to perform the test elsewhere or to only administer the HGN test. This is no longer the recommendation. Standardizing the OLS test for every type of road condition is unrealistic.

Recent field validation studies have indicated that varying environmental conditions have not affected a subject's ability to perform this test. *See* NHTSA SFST Participant Manual Session 8 – page 49 of 62.

It is not good police procedure to only administer the HGN. It affords the defense an opportunity to attack the officer for failing to give the benefit of the doubt to the subject. If it is unsafe or the conditions of the surface are such that the One Leg Stand cannot be done, offer the defendant alternative field sobriety tests (alphabet, finger count, counting backwards, etc.).

4. Original research for the one-leg stand suggested that subjects older than 65 years of age, those with back, leg, or inner ear problems, or those who are more than 50 pounds overweight had difficulty performing this test. Unlike the Walk and Turn test, weight can be a factor in the One Leg Stand test. The test can still be conducted if safe for the officer and the subject, but the clues may simply be observational.

   As noted above with the Walk and Turn test, less than 1.5% of the OLS test subjects in the original studies were over 65 years of age. There was no data containing the weight of the test subjects included in the final report. *See* NHTSA SFST Participant Manual Session 8 – page 49 of 62.

   Remember, it may be argued the test is not **"validated"** for subjects older than 65 of more than 50 pounds overweight, but this does not mean the test is not **"valid"** in showing evidence of impairment. Officers should consider age, weight, environmental factors, location, injury and/or physical ailments while administering the tests. Officers should consider all factors when conducting SFSTs at roadside. *See valid vs. validated explanation.*

5. The subject's footwear, or lack thereof, should be considered just as it was in the Walk and Turn test. The NHTSA manual suggests the officer give individuals wearing heels more than 2 inches high an opportunity to remove their shoes. It is a good idea to give subjects wearing any type of unusual footwear the opportunity to remove them prior to the test. *See* NHTSA SFST Participant Manual Session 8 – pages 49 of 62.

6. The preface found in previous manuals was especially helpful when facing defense challenges to the various environment condition challenges to the

Walk and Turn. The preface was inadvertently removed from the 2013 NHTSA Participant Manual. I am told it will be re-inserted in future updates. However, it can still be found in the 2013 NHTSA Instructor Manual's **"DUI Detection and Standardized Field Sobriety Testing – Administrator's Guide"** preface, which states:

The procedures outlined in this manual describe how the Standardized Field Sobriety Tests (SFSTs) are to be administered under ideal conditions. We recognize that the SFSTs will not always be administered under ideal conditions in the field, because such conditions will not always exist. Even when administered under less than ideal conditions, they will serve as useful indicators of impairment. Slight variations from the ideal, i.e., the inability to find a perfectly smooth surface at roadside, do not necessarily make the SFSTs invalid. (emphasis added.)

Keep this preface handy when testifying!

7. **Error in the 2013 Manual:** There is an error in the 2013 Participant Manual – Session 8 regarding the instructions to be given for the One Leg Stand. The instruction at issues is how the raised foot is to be held during the balance and counting stage.

   The proper instruction should be, "With your raised foot parallel to the ground," not "foot pointed out," or "point your toe."

   Foot parallel to the ground is missing from Participant Manual Session 8 – Page 50 of 62 and the incorrect verbiage is on Page 51 of 62, but can be found in Session 7 – Page 14 of 26 and Session 15 – Page 10 of 15.

   The proper language is also missing from the Instructor Manual Session 8 – Page 8-85 and actually uses the inappropriate "foot pointed out" language in the slide on that page. The appropriate "foot parallel to the ground" is found in the Instructor Manual Session 15 – Page 15-19.

   The intent was to remove "foot pointed out" from all manuals because the instructions in the original research study said "foot parallel to the ground." This may be making a "mountain out of a molehill," but the change is to avoid arguments that failing to use the instruction from the original research somehow invalidates the entire OLS test. To avoid the ridiculousness, the recommendation is to use the original phrase.

8. Time is critical in this test. The original SCRI research has shown a person with a BAC **above** 0.10% can maintain balance for up to 25 seconds, but seldom for as long as 30 seconds. *See* NHTSA SFST Participant Manual Session 8 – page 52 of 62.

9. Officers should always time the 30 seconds (and document how they timed the test.) The test should be discontinued after 30 seconds. *See* NHTSA SFST Instructor Manual Session 8 – page 8-85.

10. Based on the 1989 San Diego Study, if the subject exhibits two or more clues on this test, or fails to complete it, the indication is the subject is at or above 0.08. The San Diego Study found officer's arrest decisions were **83% accurate, in and of itself,** without considering any other clues or indicators of impairment. *See* NHTSA SFST Participant Manual Session 8 – page 47 of 62.

    Also see "Correct Arrest Decision" below in Quick Review.

    Note: In Idaho, officers should never testify in court about the correlation between the One Leg Stand and BAC. Example: "I observed two out of a possible 4 clues on the One Leg Stand, therefore the defendant was likely above a 0.08 BAC based on the San Diego Study." This statement is likely to cause a mistrial. *See State v. Garrett*, 119 Idaho 878 (1991) (officers not allowed to testify about the correlation between HGN and BAC level).

Quick Review of Field Sobriety Tests & Things You Should Know:

1. **What are field sobriety tests?**

    Field sobriety tests are methods for assessing another's mental and/or physical impairment. Some of the tests are considered d*ivided attention tests in that they require the individual to divide their ability between adhering to simple instructions and performing simple instructions. This basically means that a person will have to perform two tasks at one time. Impaired individuals have difficulty dividing their attention.*

2. **What do you mean by divided attention tests?**

    The test requires the suspect to divide attention among mental and physical tasks. Equate it in driving to looking forward, in the mirrors, watching the speedometer, braking, etc., at the same time. See NHTSA SFST Instructor Manual Session 7 – pages 7-13 to 7-16.

3. **Why is this important?**

    Divided attention capabilities are important because most intoxicated people can concentrate on one task, such as standing straight. They exhibit their intoxication when forced to concentrate on two or more different tasks. An example would be that an intoxicated person may see and focus on a child

stepping out into the street in front of them, but would have trouble estimating the distance to the child and more difficulty in applying the brakes. Another example of this is NHTSA's ½ inch heel to toe requirement on the walk and turn: this can be equated to missing the brake pedal by ½ inch when attempting to brake.

4. **Is driving an automobile a multi-tasked function?**

   Yes, a driver engaging in many tasks at once such as control speed, keep car in lane, keep eye on other traffic, monitoring speed, etc.

5. **Are field sobriety tests simple or complex tasks?**

   Simple. NHTSA performed these tests on hundreds of people, young and old, athletes and couch potatoes, large and skinny, tired and alert, and so forth. This group of normal people could pass the test within NHTSA guidelines when sober, but could not when intoxicated.

6. **Does fatigue affect a person's ability to perform these tests?**

   Fatigue does not have a significant affect on a person's ability to perform these tests. In any case, a trained officer will take into consideration the subject's tiredness and give the subject the benefit of the doubt.[8]

7. **What does NHTSA stand for?**

   It is the acronym for the National Highway Traffic Safety Administration. It is best to avoid acronyms such as NHTSA, HGN, WAT, OLS and others when testifying in front of a jury. Jurors are unlikely to be familiar with these acronyms leading to confusion or deciding to not pay attention. Make a point of knowing this to ensure credibility with the judge and/or jury.

8. **What does IACP stand for?**

   It is the acronym for International Association of Chiefs of Police. In 1986, the Advisory Committee on Highway Safety of the IACP passed a resolution recommending law enforcement agencies adopt and implement the SFST program developed by NHTSA. NHTSA has since sought IACP input to appoint a curriculum revision workgroup among subject matter experts.

9. **Does NHTSA certify the SFST course?**

   No. NHTSA is not a certifying agency for impaired driving training courses. There is no such thing as a "NHTSA certified course."

10. Does NHTSA certify instructors and/or the officers who complete the SFST training?

No. NHTSA also does not certify instructors or officers in Standardized Field Sobriety Testing. SFST certification is only through the respective state's law enforcement training organizations. See NHTSA SFST Instructor Manual Administrator's Guide – Appendix B – Page B-5.

11. How many versions of the NHTSA SFST Manual have been published?

There have been 11 versions of the NHTSA SFST Manual. The Original NHTSA SFST Manual was published in 1987. Curriculum revisions have occurred in 1989, 1992, October 1995, September 1997, February 2000, January 2002, September 2004, February 2006, August 2006 and the latest revision May 2013.

*Note: The cover of the 2013 Participant Manual is "**March 2013**" which is a misprint. All other areas of the Participant Manual references "**May 2013**," as does the Instructor Manual Cover and contents.*

In addition, each state may add supplemental materials to their manuals. Therefore, the state may have an additional revision date to their manuals. Idaho does not have a supplemental manual and uses the latest revision of the NHTSA manuals. Understanding the version of the manual you (or your officer) have most recently been trained on helps establish the credibility of your testimony. In addition, the testifying officer should ensure they are being questioned with the most up-to-date manual.

12. What exactly does the "Correct Arrest Decision" mean when considering the validation studies? For example, if according to the 1989 San Diego Study the correct arrest decision was made 91% of the time, doesn't that mean 9% were wrongfully arrested?

No. It does not mean drivers are being wrongfully arrested 91% of the time. The 2013 SFST Manual finally provides training on what these statistics mean. It is recommended every officer and prosecutor familiarize themselves with pages 8-12 and 8-13 of the NHTSA SFST Instructor Manual *and* Session 8 - pages 7-8 of the NHTSA SFST Participant Manual.

The manuals describe the 4 categories of arrest decisions. We will quickly review the 2 categories where the research stated the officers made an incorrect arrest decision: (1) the officer decided NOT to arrest the subject and the subject's BAC was above the illegal per se limit; and (2) the officer decided to arrest the subject but the subject's BAC was below the illegal limit.

In the first category – these subjects were impaired individuals who the officers failed to observe the clues. The officers missed the clues! This may have been

due to a number of individuals who were alcohol tolerant and able to do well on the Walk and Turn and One Leg Stand, despite the fact they were still impaired at a level above the per se limit. The non-arrest decision ultimately benefited the driver.

In the second category – these individuals had BAC levels below the illegal per se level and the arrest decision was recorded as an error. Yet, the arrests may have been legally justifiable according to the individual state's statute. For example, a person with a BAC of 0.07 is impaired and likely to exhibit clues in the SFTS. In many states, these individuals would have been rightfully prosecuted for their impairment. However, in the studies, the decision to arrest the subject was considered an error.

Even if your state statute precludes prosecution for a driver with a BAC of 0.07 (like Idaho), this does not mean the person is not impaired and safe to drive. Simply because a person's BAC is below a 0.08 does not mean the individual is not impaired or maintains their normal use of mental or physical faculties. Based on decades of research, there is scientific consensus that alcohol causes deterioration of driving skills beginning at 0.05 BAC or even lower. *Refer to discussion in HGN section by clicking here.*

Therefore, when considering the 91% statistic, it is a gross mischaracterization that 9% of the test subjects were incorrectly arrested. A more correct interpretation is that many impaired individuals were not arrested, when they should have been. An understanding of this section of the SFST manual should help clarify why the HGN is the most reliable in making correct arrest decisions (as this term is defined in the studies).

Review the material in the manuals and be prepared to explain the statistics in simple terms in order to effectively articulate them to a jury in a courtroom.

13. What is the definition of impairment?

Historically, neither scientists nor legal scholars could agree on a definition of "impairment" or "under the influence." In 1938, the National Safety Council's Committee on Alcohol and Other Drugs (CAOD) collaborated with the American Medical Association's Committee to Study Problems of Motor Vehicle Accidents to establish standards for defining the phrase "under the influence." Based on the research at that time, these committees established presumptive levels, defined in terms of blood alcohol concentration. Based on their recommendations states began enacting statutes wherein the "presumptive levels" shifted focus from officer observations to chemical testing in impaired driving investigations. In 1971, CAOD recommended lowering the presumptive level to 0.08. However, it took decades before this recommendation was reflected in criminal statutes.

Research Studies Regarding SFSTs:

1. **Most Recent Validation Studies at 0.08 or Below**

    a. **Florida 1997**

    Dr. Burns, and the Southern California Research Institute (SCRI). The study used officers with an average of 9.5 years experience of conducting the 3 standardized test battery, and they followed the NHTSA guidelines. The study demonstrated that 95% of the officers' decisions to arrest drivers were correct using 0.08 as legal intoxication. Again, some of those released were intoxicated, but the officers gave them the benefit of the doubt. Dr. Burns states that overwhelmingly, when officers err, they err by releasing intoxicated individuals and not by arresting sober individuals.

    b. **Colorado 1995**

    Dr. Burns and the SCRI revealed that snow, cold, and slightly sloped sidewalks did not affect the officer's ability to make the correct arrest decision. Seven agencies were involved. Observers were in half the police vehicles. These observers were SFST trained. They were there to ensure SFST's were done correctly. These observers also tested people who were released. The study revealed that officers using SFST battery, made the correct arrest decision 93% of the time.

    This was corroborated by a breath test.

    c. **San Diego 1998**

    Dr. Burns and the SCRI used trained officers in this study using the SFST battery. The study revealed that the officers made the correct arrest decision 91% of the time. In this study there were no observers riding with the officers and the officer's were allowed to use portable breath test devices (PBTs).

2. **Original SFST Validation Studies**

    a. **NHTSA's Psychophysical Tests for DWI Arrest - June 1977:**

    Study to determine the easiest and most effective methods of roadside testing in order to increase the ability of police to detect impaired drivers. The study concluded that alcohol gaze nystagmus testing was most effective, along with walk-and-turn and one-leg stand tests.

b. **Development and Field Test of Psychophysical Tests for DWI Arrest - March 1981:**

Study to determine the effectiveness of the sobriety test battery and standardized the administration and scoring of each test. Test battery was subject to laboratory and field evaluation. Concluded that more field testing needed to be performed, but the study showed the test battery would be effective in increasing the ability of police officer's to detect impaired drivers.

c. Evaluation of a Behavioral Test Battery for DWI - September 1983:

Study to confirm the effectiveness of the standardized field sobriety test battery using a larger sample size. Concluded that the HGN test was the most effective of the three tests and that greater accuracy in determining whether a subject's BAC is over .10 can be gained by combining the scores of the HGN and Walk-and-Turn.

3. Study: **A Review of the Literature on the Effects of Low Doses of Alcohol on Driving-Related Skills**

   By Dr. Herbert Moskowitz (April 2000):

   This study reviewed the scientific literature regarding the effects of alcohol on driving-related skills. One hundred and twelve articles – from 1981 to 1987 - were reviewed. The review of the literature provided strong evidence that impairment of some driving-related skills begins with any departure from zero BAC. By 0.050 g/dl, the majority of studies have reported measurable impairment by alcohol. By BACs of 0.080 g/dl, more than 94% of the studies reviewed exhibited skills impairment. Specific performance skills are differentially affected by alcohol. Some skills are significantly impaired by BACs of 0.01 g/dl, while others do not show impairment until BACs of 0.06 g/dl.

4. Study: **Driver Characteristics and Impairment at Various BACs**

   NHTSA (August 2000):

   This study used a driving simulator and a divided attention task. The data obtained with 168 subjects demonstrates that alcohol impairs driving-related skills at 0.02, the lowest level tested. The magnitude of impairment increased consistently at BACs through 0.10, the highest level tested. While there is partial evidence of impairment at 0.02, a major conclusion of this study is that by 0.04, all measures of impairment that are statistically significant are in the direction of degraded performance. The data provides

no evidence of a BAC below which impairment does not occur. Rather, there was evidence of significant impairment throughout the BAC range of 0.02 to 0.10, with increasing percentage of subjects impaired and increasing magnitude of impairment at higher BACs.

5. Study: **Analysis and Evaluation of the Effect of Varying Blood Alcohol Concentrations on Driving Ability**

   Maurice E. Dennis (April 2000)

   Dr. Dennis trained 19 people on a Driving Skills Enhancement Program that consisted of 6 different complex driving situations. They were: Skid Control, Auto Control Monster, Crash Simulator, T-Turn, Blocked Lane, and the Slalom.

   There were also Non-Driving Exercises involving balance, vision, and reaction time. All subjects received training on all aspects of the experiment. The test subjects were given a test using the Intoxilyzer to ensure they had no alcohol in their system. They were given a pretest on all driving and non-driving activities to determine their pre-drinking abilities.

   The data was recorder on all subjects for comparison with ability after reaching designated BAC's. The subjects were then dosed to .04, .07, and .10 and given all the tests after each designated BAC.

   Results: On Complex Driving Exercises (Skid Pad, Auto Control Monster, Crash Simulator)

   BAC DECLINE
   .04 13%
   .07 17%
   .10 24%
   On Less Complex Exercises (Blocked Lane, T-Turn, Slalom)

   BAC DECLINE
   .04 2%
   .07 3%
   .10 8%

6. Study: **Nystagmus Testing in Intoxicated Individuals**

   Karl Citek, OD, PhD (November 2003):

   Dr. Citek, an optometrist, did a study testing HGN and VGN at different positions: standing, seated, and supine. He confirmed the validity of the HGN test in the standing posture to discriminate blood alcohol levels of .08 and

.10. He also established, with similar accuracies and reliabilities, the use of the HGN test in the seated and supine postures. There was a statistical difference in the observation of HGN based on test posture. The difference happened in the seated position and was attributed to the difficulty of seeing the eyes. If officers have to conduct the HGN in the seated position, it is recommended that they position the subject in such a way that the subject's eyes can be seen easily throughout the test. This may involve asking the subject to turn the body slightly at the waist, in addition to the head turn used in the current study. Such a minor change in posture will not affect the result. They also confirmed that VGN is present only when signs of HGN are present, and that the VGN test can be used to identify high levels of impairment at any test posture.

7. Study: **Robustness of the Horizontal Gaze Nystagmus Test**

   ***See also* NHTSA – Traffic Tech – January 2008**

   Marcelline Burns (September 2007):

   Dr. Burns conducted a study to determine if defense attorney attacks on variations on the HGN test makes it inaccurate, thereby invalidating the test. The 3 important experiments test three major challenges by defense attorneys: change in stimulus speed; change in stimulus elevation; and stimulus distance from eyes.

   The first experiment varied the speed of the stimulus from 1, 2, and 4 seconds. *Conclusion*: In summary, the principal effect of variations in the speed of the stimulus was found to be false negatives, failures to detect a breakdown of smooth pursuit movements (failure to detect clues). The finding that rapid stimulus movement lessens the likelihood of observing lack of smooth pursuit is relevant to law enforcement. In the interest of accuracy, stimulus speed should not be faster than 2 seconds. The findings do not support the suggestion the variations in stimulus speed led to false alarm errors and thus should not invalidate test findings.

   The second experiment tested variations in stimulus level compared to eye level, 2inches above eye level, and 4inches above eye level. *Conclusion:* Greater accuracy in detecting nystagmus was observed when HGN was conducted at eye level and four inches above eye level. A four-inch stimulus elevation results in the test subject opening the eyes more thereby making clue observation easier for the officer. It did not increase false positive observations in comparison to the other conditions. It has been suggested that this position engages different eye muscles than more moderate positions and would, therefore, yield radically different observations. The data does not confirm that claim nor do they provide evidence that would support a change in current training.

The third experiment varied the distance of the stimulus from 10 inches, to 12-15 inches, and to 20 inches. *Conclusion*: NHTSA recommends that the stimulus be held 12-15 inches from the eyes. Increasing that distance to 20" did not alter the number of signs observed. When the distance was decreased to 10", officers correctly reported more signs. The magnitude of the difference is small, however, and is viewed as insufficient basis for changing the current standard.

Over-All Conclusion: Variations in the way HGN is performed tend to lead to false negatives, not false positives, and do not invalidate the HGN test.

8. Study: **The Visual Detection of DWI Motorists" US Department of Transportation, DOT HS 808 677**

Problems Maintaining Proper Lane Position

Weaving, weaving across lanes, straddling a lane line, swerving, turning with a wide radius, drifting, almost striking a vehicle or other object

Speed and Braking Problems

Stopping problems (too far, too short, or too jerky), accelerating or decelerating for no apparent reason, varying speed, slow speed (10+ under speed limit)

Vigilance Problems

Driving in opposing lanes or wrong way on one-way, slow response to traffic signals, slow or failure to respond to officer's signals, stopping in lane for no apparent reason, driving without headlights at night, failure to signal or signal is inconsistent with action

Judgment Problems

Following too closely, improper or unsafe lane change, illegal or improper turn, (too fast, too slow, or too jerky), driving on other than designated roadway, stopping inappropriately in response to officer, inappropriate or unusual behavior (throwing, arguing, etc.), appearing to be impaired.

9. Study: **Sleep Deprivation Does Not Mimic Alcohol Intoxication on Field Sobriety Testing**

   Karl Citek, O.D., Ph.D.; Ashlee Elmont, O.D., Christopher Jons, O.D., et.al.

   Previous research shows that sleep deprivation (SD) produces cognitive impairment similar to that caused by alcohol intoxication. Individual studies suggest that SD also causes deficits in motor skills that could be mistaken for intoxication. Consequently, SD often is used as a defense when an impaired driver is charged with driving while intoxicated. Twenty-nine adult subjects participated in two test sessions each, one after a full night's rest and the other after wakefulness of at least 24 hours. Subjects consumed prescribed amounts of alcohol during each session. Law enforcement officers conducted field sobriety tests identical to those with which a driver would be assessed at roadside. Researchers also measured clinical responses of visual function and vital signs. The presence and number of validated impairment clues increase with increasing blood alcohol concentration but not with SD. Thus, SD does not affect motor skills in a manner that would lead an officer to conclude that the suspect is intoxicated, unless intoxication also is present.

   Note: The "previous research" discussed in this study is the Booker study found in Endnote 5. In addition, Booker also published an article entitled, "The Horizontal Gaze Nystagmus Test: Fraudulent Science in the American Courts," 44 SCI. & JUST. 133 (2004).

   The NDAA's National Traffic Law Center addressed Booker's article explaining the study is "replete with hyperbole and flawed reasoning, factually and legally." Click here to read the NTLC response.

10. Study: **The Competency and Accuracy of Police Academy Recruits in the Use of the Horizontal Gaze Nystagmus Test for Detecting Alcohol Impairment – *New England Journal of Optometry***

    Jack E. Richman, O.D. and John Jakobowski, M.S. (1994: Vol. 47. No.1)

    The purpose of this study was to determine the accuracy in the use and interpretation of the HGN test by new police officers following a precise training program in determining probable cause for arresting an impaired driver. The results indicated 87.8% sensitivity, which is the percentage of individuals who will fail the test and be identified correctly on alcohol breath testing as being under the influence of alcohol. The present study demonstrates and supports earlier studies as to the effectiveness of the eye movement procedure in differentially identifying impaired individuals from those who are not impaired. It further supports the training program to effectively train new police officers to apply the HGN test with excellent results.

11. Study: **Experimental Evaluation of an FST Battery in the Marine Environment**

    US Coast Guard (June 1990)

    In this study, 97 volunteers were dosed with alcohol in a recreational boating setting. Experienced marine officers estimated the subject's BAC through field sobriety testing. The agents estimated impairment correctly 82% of the time. It was concluded that the accuracy of FSTs, notably the HGN, was not deteriorated in the marine environment. All officers gave the HGN test on the boat and on land. The remaining water tests consisted of some combination of the "hand pat," "alphabet recital," or "nose touch." On land, after allowing the subjects ten minutes to regain "land legs," the subjects were then given either the WAT or the OLS (in addition to all being given the HGN again).

12. Study: **Validation of Sobriety Tests for the Marine Environment**

    D.D. Fiorentino (2010)

    In this study, 331 boaters were administered four float tests in a seated position on The Lake of the Ozarks to determine their effectiveness in detecting impaired boaters. The four tests were the HGN, the Finger To Nose (FTN), the Palm Pat (PP), and the Hand Coordination (HC) tests. The study concluded that the four tests' results were consistent with the findings in roadside SFSTs and that these tests may be useful for marine officers to use in determining impairment at 0.08 and above for operators on the boat. HGN alone correctly predicted BAC status in 85% of the cases. FTN alone correctly predicted BAC status in 67% of the cases. PP alone correctly predicted BAC status in 65% of the cases. HC alone correctly predicted BAC status in 59% of the cases. Administering the HGN test alone was the most predictive of impairment even when combined with the other tests, although HGN and any one of the other tests was also 85% predictive. The study found that officers who could properly administer the test may confidently rely on HGN done on the water.

13. **Admissibility of Horizontal Gaze Nystagmus**

    NDAA – National Traffic Law Center (2003)

    This monograph discusses how to overcome the foundational hurdles placed before prosecutors in many jurisdictions when attempting to admit HGN evidence. The authors explain how the HGN test is the best field sobriety test – one that cannot be practiced or physically controlled by the impaired driver. The monograph includes articles from a variety of leading HGN researchers and experts in the field of optometry.

14. **Horizontal Gaze Nystagmus: The Science and the Law – A Resource Guide for Judges, Prosecutors and Law Enforcement**

    NDAA – National Traffic Law Center

    This guide was is an effort to provide accurate information regarding the use of the HGN test in impaired driving enforcement and dispel the continuing controversy around HGN. Among other things, this guide provides an overview of the science supporting the HGN test as a valid indicator of impairment, distinguishes between HGN and other forms of nystagmus, and provides the necessary tools to establish admissibility of the HGN test in court. The tools include studies, articles, illustrations and predicate question examples.

15. **A Behavioral Optometry/Vision Science Perspective on the Horizontal Gaze Nystagmus Exam for DUI Enforcement – *The Forensic Examiner***

    Bertolli, E.R., Forkiotis, C.J., Pannone, R.D., and Dawkins, H. (Spring 2007)

    Many myths and incomplete information relate to the Horizontal Gaze Nystagmus (HGN) standardized field sobriety test (SFST). This article addresses many of these misconceptions and distortions from a vision science standpoint. Brief reviews of the SFSTs, optometry perspectives on vision science relating to the SFSTs, and ocular findings of drugs follow.

16. **American Medical Association – Policy Recommendations**

    Although Drunk driving did not become a prominent public health issue until the 1980s, the American Medical Association was involved in defining "under the influence" in 1938 and had recommended limits to determine the influence of alcohol on suspected drunk drivers in 1945. The AMA continues to encourage state medical societies to urge their state legislators to adopt a blood alcohol level of 0.05 as per se illegal for diving under Policy H-30.973 and Policy H-30.986, modified in 1997 calls for 0.04 percent. The AMA has explains this is the limit where all individuals are measurably impaired.

    As discussed above, national and international traffic safety and public health organizations, including the American Medical Association (AMA 2013), the World Health Organization (WHO 2013), the World Medical Association (WMA 2013), and the Association for the Advancement of Automotive Medicine (AAAM 2009) and the National Transit Safety Board (NTSB 2013) have advocated setting BAC limits at 0.05 or lower. More than 100 countries have already established per se BAC limits at or below 0.05. *See Alcohol and the Driver, The Journal of the American Medical Association, 1986: 255(4): 522-527.*

Endnotes

[1] National District Attorneys Association (May 2003), *Admissibility of Horizontal Gaze Nystagmus Evidence*, p. 5.

[2] *Id.* at 20.

[3] *Id.* at 17.

[4] National Highway Traffic Safety Administration, U.S. Department of Transportation, *Development and Field Test of Psychophysical Tests for DWI Arrest*, No. DOT-HS-805-864 (March 1981) at 79-83, note 16 at 10-11, and at 9. Also C.J. Forkiotis, *Optometric Exercise: The Scientific Basis for Alcohol Gaze Nystagmus*, 59 Curriculum II, No. 7 at 9 and No. 5 at 11 (April 1987).

[5] Booker JL. End-position nystagmus as an indicator of ethanol intoxication. *Sci Justice* 2001;41:113-6.

[6]Citek, Karl et. al. Sleep Deprivation Does Not Mimic Alcohol Intoxication on Field Sobriety Testing, *J Forensic Sci., September 2011, Vol. 56, No. 5.*

[7] Fell, James C. & Voas Robert B., Reducing Illegal Blood Alcohol Limits for Driving: Effects on Traffic Safety. *In Drugs, Driving and Traffic Safety,* Birkhauser, 2009, pp. 415-437.

[8] *See* Citek, Karl et. al. Sleep Deprivation Does Not Mimic Alcohol Intoxication on Field Sobriety Testing, *J Forensic Sci., September 2011, Vol. 56, No. 5.*