

**ATTACKING STANDARDIZED FIELD SOBRIETY  
TESTS AND BREATH TESTS©**

**Strategies in Defending DWI and DUI Cases in Texas  
San Antonio, Texas  
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# **ATTACKING STANDARDIZED FIELD SOBRIETY TESTS AND BREATH TESTS**

## **Standardized Field Sobriety Tests**

### **1. Standardized Field Sobriety Tests—what’s their point?**

A. Origins and Purpose: The Standardized Field Sobriety Tests (SFST) were developed in the late 1970’s by a private company from California and gradually accepted on a national basis. Ultimately, they are presented by the State in court to legitimize and substantiate the arresting officer’s opinion of intoxication.

1. The initial science is questionable.
  - a. At best, the scientific literature demonstrates that even when properly applied, these tests have significant margins of error and cannot rule out other causes for failures.<sup>1</sup> Given the statistical inadequacies, they are litmus tests at best; giving an indication that your client might have drunk some alcohol.
2. Today, DWI officers are taught by other officers, who were taught by other officers, and so on and so on.... So where’s the scientific training or background now? Some officers will testify as to their understanding of the “science” and statistics behind these tests if you ask the wrong question during cross examination. You must control the officer’s testimony with leading questions.
3. Look through the Instructor and Participant manuals: they are set up to make sure that when an officer

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<sup>1</sup> Hlastala, M., et al., Statistical Evaluation of Standardized Field Sobriety Tests, J. Forensic Sci., May 2005, Vol. 50, no.3

testifies, that the FST observations and conclusions are admissible and presented to the jury.

4. These books are not written with an eye toward an unbiased investigation of intoxication. In the end, if many of these officers who have been trained to administer FSTs think you've been drinking, they are not going to stop until they take you down and get a breath sample out of you—or a refusal.

B. The purpose of Standardized Field Sobriety Testing: litigation tool, nothing more.

1. The National Highway Traffic Safety Administration (“NHTSA”) Instructor Manual clearly states that a principal objective of the SFST program is to “obtain more convictions” NHTSA Instructor Manual, February 2006, p. 2-3.

2. SFST’S are used to validate the officer’s initial assessment. If most officers were truly honest, they would tell you that they decide whether to arrest someone within moments of their initial contact. These tests aren’t used to investigate with an unbiased eye whether the test subject is intoxicated or not. They are used to allow the officer to better present his testimony at trial. NHTSA Instructor Manual, February 2006, p. 3.

- a. How many times have you seen the officer arrest your client on video after a very good performance?
- b. Try asking the officer after cross-examination of each test if he would have arrested your client at that point.
- c. How many times have you seen a very solid FST performance followed by more non-standardized tests?
  1. ABC’s, Nose touch, reading, Rhomberg, etc.

2. Once the officer starts the process, the end result will be arrest—unless you give a breath sample, and even then, a Drug Recognition Expert Officer could be called in.

C. Ultimately, you come full circle: it is really the officer's *OPINION* that dictates everything. Use this to break down what is really going on with the FST's in your.

## 2. **The Standardized Field Sobriety Tests—there are only three.**

The NHTSA website describes these three tests as follows<sup>2</sup>:

A. Horizontal Gaze Nystagmus (HGN). This includes Vertical Gaze Nystagmus.

In the HGN test, the officer observes the eyes of a suspect as the suspect follows a slowly moving object such as a pen or small flashlight, horizontally with his or her eyes. The examiner looks for three indicators of impairment in each eye: if the eye cannot follow a moving object smoothly, if jerking is distinct when the eye is at maximum deviation, and if the angle of onset of jerking is within 45 degrees of center.

B. One Leg Stand.

In the One-Leg Stand test, the suspect is instructed to stand with one foot approximately six inches off the ground while looking at the foot and count aloud by thousands (One thousand-one, one thousand-two, etc.) until told to put the foot down. The officer times the subject for 30 seconds.

C. Walk and Turn.

In the Walk-and-Turn test, the subject is directed to take nine steps, heel-to-toe, along a straight line. After taking the steps,

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<sup>2</sup> [www.nhtsa.dot.gov/people/injury/alcohol/SFST/appendix\\_a.htm](http://www.nhtsa.dot.gov/people/injury/alcohol/SFST/appendix_a.htm)

the suspect must turn on one foot and return in the same manner in the opposite direction.

That's it, there are no other standardized FSTs. Nevertheless, some officers will employ other tests if they don't like what they are seeing in the above three. Some of these could include:

- Reciting the alphabet
- Reading from a card (the card used by the San Antonio Police Department utilizes poor syntax and is designed to trip you up if you don't read well in the first place. If you have one of these used in your case, you might consider copying it and asking random jurors to read it.)
- Balancing test (known as the Rhomberg test. This test requires the test subject to estimate 30 seconds with standing straight with the arms at the side while tilting the head back with the eyes closed. This one actually used to be widely used, but was deemed too dangerous as people tended to fall. Try it sober when you are tired and you'll see why.)
- Nose touch (pay attention to the way the test is explained)
- Finger count (counting up to four and back down to one several times using one's thumb against each finger on the hand)

### **3. Rule #1: there are no rules for how you attack the FSTs**

Every case is going to be different no matter how close your fact pattern is to your last case. This is because the players will have changed: judge, prosecutor, client, police officers(s) and your jury. What persuades one jury might not work with the current one. What confounded one officer won't faze the next one. The following are guidelines to help you organize your thoughts about preparing your defense for your trial. Use them to help support your theory of the case—but don't feel that any or all of them must be used in every case. Indeed, sometimes less is more.

Pay attention to the manner in which the officer testifies. Sometimes he or she will merely rattle off a list of clues quickly. You get the impression that his or her testimony is the same with every trial; and you should convey that during argument to the jury.

#### **4. Attack the “science” of the FST’s**

The prosecution should attempt to bolster the OPINION of the arresting officer by inflating the scientific legitimacy of the testing. Their job is to present these tests as reliable scientific proof that the officer is correct in his/her opinion about intoxication. They want the jury to focus on the clues found by the officer as a whole and not look at the problems associated with each test or clue.

- A. Your job is to demonstrate the shortcomings of the FSTs;
- B. Show that they are not practiced in the controlled circumstances; and
- C. Show your officer doesn’t understand theory behind it.
- D. Questions to ask: what is a control group? Why have a control group when conducting a study? What about anomalies—individuals with nervous conditions, handicaps, injuries, illnesses, lack of coordination?

These tests are presented as the product of much scientific testing and as a highly accurate tool in demonstrating intoxication. In reality, they only “might” do these things. Perfectly sober individuals can fail these tests for a number of reasons. Moreover, how many times has the officer detained (arrested) someone after the field sobriety tests only to have them pass the breath test?...

At best, the field officer can only honestly testify that he is merely doing what he was taught to do in a class. In fact, the only scientific certainty these three standardized tests possess is that there are only three of them. Reading the scientific literature will illustrate that these FSTs are not the product of rigorous and

unbiased scientific testing. The literature demonstrates a debate over their efficacy and accuracy.<sup>3</sup>

## 5. Dealing with Voodoo science: HGN

HGN is the most misunderstood of the three FSTs. Yet it is becoming increasingly more important in DWI cases. In more and more cases you will see only the HGN test with no other FSTs. Either the motorist didn't know what he was submitting to or the officer relies solely on HGN. Many people stopped by an officer have no idea what he is doing when being asked to perform this test. Most people think they "passed" the test with flying colors because they following the pen. As a consequence, many will submit to it but refuse all other FSTs—thinking that they have refused all of the tests. Pay attention to how the officer approaches your client and whether the officer even requested the individual submit to the test or whether the officer just told them what to do. You probably can't suppress these tests under current law, but it sure starts looking like an actual arrest when the officer orders your client to submit. More importantly, it demonstrates that the officer has already made up his mind on intoxication.

Just like the motorist, most jurors don't understand HGN either. You must point out that the officer really doesn't either—or is not qualified to explain it. Controlling officer testimony with leading questions is critical here. You need to know how your judge rules here—how will he or she apply the Article 7 rules of Evidence regarding expert testimony? You should file a written pre-trial Emerson<sup>4</sup> Motion in Limine to limit the officer's testimony to that of a non-expert testifying witness; you can also make an oral motion during trial since it is an *in limine* motion. Some of the testifying officers actually know some of the "scientific studies" that exist in support of the HGN and can recite it from the stand if you let them. At best, these officers should know how to administer the test; but they are not qualified to testify about the science behind it.

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<sup>3</sup> Hlastala, M., et al., *Infra.*; Cole, S. & Nowaczyk, R., Field Sobriety Tests: Are they Designed for Failure?, 79 *Perceptual and Motor Skills* 99 (1994)

<sup>4</sup> Emerson 880 S.W.2d 759 (Tex Crim App—94).

There is little scientific agreement supporting the notion that HGN test as promoted by the NHTSA as an effective means of gauging intoxication. The NHTSA website,<sup>5</sup> provides a list of publications both favorable to and critical of the HGN test. The primary backers of the HGN test are those studies promulgated by NHTSA itself. Many serious scientists find much fault with the HGN test as it is used in DWI prosecution.

Remember, the test is not going to be given in the manner any physician or scientist would. Your officer will not truly be able to rule out the vast majority of innocuous causes of nystagmus. Start attacking the HGN in Voir Dire. For example, you could ask “who here would rely on a non physician to diagnose a problem with your eyes? Who would feel comfortable having this done by a general practitioner rather than a board-certified ophthalmologist? Why not let a technician with a couple of hours of training do this? The answer should be: no way, I want an expert; I don’t want someone else who will either misdiagnose or fail to see something. Furthermore, I’m going to get a second opinion from another expert because it’s my eyes.

## **6. Did the officer correctly administer the HGN test?**

This test is frequently administered wrong. You must know the testing procedures by heart to attack the HGN effectively. You will be surprised to see how many officers fail to hold the pen long enough or fail to make enough passes to validate the test pursuant to the NHSTA manual. Sometimes the officer moves the pen too quickly. Review the NHTSA Instructor Manual from page VIII-5 to VIII-35, February 2006 edition. Review your DWI video before trial and verify the correct procedure was followed pursuant to the NHTSA manual.

One starting point for reviewing this test is to time the overall length of the test. If it’s under a minute, the officer skipped some steps and the test is invalid. Have the officer demonstrate what he believes a 45 degree angle to be. Contrast that with the video if

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<sup>5</sup> /www.nhtsa.dot.gov/people/injury/enforce/nystagmus/app\_f.html

your video allows. For whatever reason the NHTSA manual glosses over how to obtain a 45 degree angle. Finally, make sure your officer was TCLOS certified to administer the test at the time of your client's arrest.

## **7. Attack the manner of giving the instructions.**

Remember, the FSTs are designed to be divided-attention tests. If you have a video, pay close attention to the way in which the officer gives his or her instructions. Is he or she facing your client when speaking? Is there any road noise? Is there anything else going on in the background? Does he or she repeat any instructions? Are the instructions really that clear? Could multiple meanings be given to them? How precise are they? Have they added more requirements to each test than what the NHTSA manual prescribes?

Many officers will whip through their instructions more with an eye toward finishing them quickly instead of caring whether they make sense or whether they are clear and concise. For example, on the walk and turn test, many times they actually fail to say "touch" heel to toe. They might say "walk like this" and from the video it is impossible to tell if the heels touched. They might instruct your client to "walk heel to toe" but actually demonstrate a walk that doesn't actually touch. Remember, the officer has done this many times. However, this may be the first time your client has seen the test. Moreover, your client is going to be very nervous at this time. Imagine how one feels when receiving a traffic citation: now multiply that feeling several times and you can imagine the anxiety your client must have felt.

At trial, you should expect your officer to testify that the test is very simple and was very clearly explained. You might pose the hypothetical question to the officer if he believes that all of the members of the jury understood the instructions themselves based on what the video showed. Hopefully your prosecutor will jump up and object, underscoring your point.

Your jury should react favorably to your client's situation if the officer appears not to have been fair or helpful in explaining the tests. Remember, this officer has either watched, performed or administered each of these tests many times before he makes his first arrest for DWI without a supporting field training officer present at the scene. He knows what the test is about, how to do it, and what clues officers are looking for. Your client does not. (Be very careful here if you are defending a DWI 2d or 3d here on how you cross the officer or examine your client).

If there is no video, you might think about asking the officer to recall exactly what he said to your client when he gave the instructions. Once again, if you get an objection, or if the officer says he really can't remember, then you've demonstrated that the FSTs are probably not administered in a uniform, or standardized way....

## **8. Attack the circumstances/setting of the tests.**

- A. Road Noise. Noise can greatly affect one's ability to listen to and understand what the officer is saying. The microphone on his or her person is going to pick up the audio from his mouth much better than your client. This is especially true if the officer is facing away from your client.
- B. Lighting. Can either be distracting or insufficient. Try looking into the headlights of your car and seeing what is going on in front of you as well. What about any revolving police lights on the patrol car or backup vehicle?
- C. Traffic. Sometimes your client has had to pull over on the road. What is the traffic like? Wouldn't a normal person be concerned about getting run over? Your client is probably going to be much more concerned about the traffic than the officer who does this multiple times each night. This is a great illustration of the presence of sound mental faculties on the part of your client. The Texas Department of Transportation clearly warns against parking on the roadway. It is a violation

of the Transportation Code to park on certain roadways unless it is an emergency—because such a practice is dangerous!

- D. Language. Perhaps your client only speaks English as a second language and the officer doesn't accommodate this or attempts to speak that language albeit poorly. Also, don't underestimate the confusion a language or especially a cultural barrier can cause.
- E. Surface conditions. Make sure you know what the scene looked like. Obviously the closer to the time of arrest, the better. Look for all of the normal suspects: uneven surfaces; slick or wet areas; loose road material; cracks.
- F. Weather conditions. Know the conditions at the time of the testing. Wind and cold temperatures have an obvious effect on your client. Also, look at the clothing your client is wearing, is it bulky? Does it restrict movement?
- G. Miscellaneous. Is your client wearing shoes that make testing more difficult. Did the officer allow him or her to remove them? Is removal an option (cold or wet weather)? Is your female client wearing high heels? Any difficulty in taking them off?
- H. Improper testing. Proper administration of the test by the officer is a big problem. Officer might go through the sweeps on the HGN too quickly, for example, or require more things from your client on a particular test.

## **9. Your review of the officer's DWI report.**

- A. Look for what the prosecutor will present at trial to demonstrate intoxication.
- B. Look at what the prosecutor will overlook or ignore.
- C. Remember, your client gets no points for doing things right. They only look at the errors.
- D. Make a list of all of the factors that could be noted in the report and tally up your client's true score.

- E. Cross the officer on all of the boxes that he didn't check or make a note on. He will either say he doesn't remember or there was no such clue. If he doesn't remember much, you can later argue he made up his mind too fast after only a few observations and never gave your client a valid chance.
- F. If you have a video, you can use it to fill in the blanks yourself for all of the positive clues the video shows. Be creative about what you note.
- G. If you have a copy of the arrest report (in Bexar County, usually only obtained from the DPS attorney from the ALR hearing), blow it up and check off the positive clues as the officer testifies if you have a solid video to back you up.

## **10. The Tests only look for the negative**

There is nothing scientific about how the tests are scored. Even the statistical margin of error found by NHTSA is significant—up to 23% depending on the criteria used. The officer is merely tallying up enough clues to testify later your client failed. If you look at each test and break it down, you can find a much larger number of clues or parts to the test than what will be presented by the State. For example, each step of the walk and turn test presents multiple clues. If done as the officer requested, you could argue your client: followed directions, completed the step correctly, did not fall, did not use his arms to balance, did not step off of the line, etc.

When you add up all of the things that your client did properly, you are probably going to have a good grade. The officer, for instance, may say that he saw 6 clues, but by breaking down the test, you may find as many as 90 clues on the test. 84 out of 90 is a passing grade in most classes I've been in.

Most prosecutors are taught to look at the entirety of the circumstances of the case. They are instructed in their own CLE courses to point out that Defense attorneys ask jurors to “go down rabbit trails” or attack individual points and fail to look at the big picture. Ironically, it is the prosecution itself that fails on this point in many cases.

If you only look at the negative and never give credit for what was done well, which side is focusing too narrowly? Who is asking the jury to ignore the facts? Put the case in its proper context. Point out all of the circumstances that favor your client. Nobody else is going to do it.

## **11. Anyone can be an expert on intoxication.**

You must demystify the officer's credentials. If the officer is trained and certified to give FSTs this only means another officer has taught him how to give a couple of tests. The officer does not have a scientific background. He will not have participated in true scientific tests. He will not be qualified to testify as an expert witness about the science—or lack thereof—of the HGN test.

A good DWI prosecutor will work to present the officer as someone able to detect intoxication that others can't. The State will take a driver who may have been stopped for some egregious traffic violation like a burned out license plate light and turn him into a drunk who can mask his signs of intoxication well. In other words, the jury might not be able to see them, but the signs of intoxication are there. Funny thing is, what is masking if your client's reaction times and coordination are good on a video? Seems to me that that is proof he has not lost the normal use of his mental and physical faculties.

In voir dire and throughout your case, you need to point out that every knows what an intoxicated person looks like. This is not rocket science. However, they dress it up to bolster the officer's testimony. Moreover, remind them your client is charged with Driving while *intoxicated*, not with *Drinking* and Driving. The latter happens to be only a Class C violation in Texas.

Bottom line: if your client was able to drive safely, reacts promptly to the officer's take down lights, acts normally, follows directions, and looks good on the video, what else does he or she have to do? How was he or she a danger on the road?

## **12. Conclusion: Asking the abnormal to prove the loss of normal?**

These tests are designed for failure. Does anyone seriously have the balance on one foot in order to drive safely? If someone has poor balance, is he or she a liability when driving? Are any of these tests given when one applies for a driver's license? Moreover, if the tests occurred in the middle of the night, who is alert or coordinated at that hour anyway?

These questions may seem silly. Their point, however, is to illustrate why FSTs are at best a possible indicator as to whether someone has been drinking alcohol or has ingested some drug that may affect his or her ability to drive safely. Nothing more. There is no scientific correlation between performance on these tests and intoxication. Do not let the State get away with leaving the jury with that impression.

## **BREATH TESTS**

This portion of the paper is not an exhaustive explanation of how the Intoxilyzer 5000 is supposed to work or of how to attack it. Rather, it is a framework to understanding how the State will present this machine to the jury and to preparing yourself to rebut this presentation. I have attempted to cite the salient scientific articles to allow you to read them yourself. As you do your own research, you will find other articles. Acquaint yourself with enough to be comfortable illustrating the shortcomings of the machine. You will need to do this to effectively cross the BT supervisor who has had years of experience defending the Intoxilyzer BT program.

You will find that there is much more debate about the efficacy of this machine in the scientific literature than your local BT supervisor is willing to admit. Always remember, the BT supervisor is ultimately in charge of defending the BT program that is in place. He or she is not a neutral witness.

## **1. Be realistic when planning your attack on breath tests.**

You must be realistic in what you are expect to do in trial. Remember that however flawed or suspect the Intoxilyzer is, it is still a certified by the state of Texas and most jurors will give that much weight. You must rebut this presumption from the beginning. During voir dire, ask about the old breathalyzer machine—most jurors will think that it is still being used. Let them know that machine is no longer certified because of the many problems associated with it. Remind them, however, that for a time it was the certified “instrument” backed up by the State. You should have some jurors who will remember or have heard of these problems.

Know the science behind the machine and the studies that question its accuracy. The breath test supervisor in your area should be well versed in the science that validates his or her machine; he or she should also know many of the studies critical of breath testing. He or she will have testified many times so you should expect him or her to know all of the things you will use in cross examination. You must use leading questions that are very narrowly tailored to make your points. You should expect the supervisor to have an answer for all of the concerns the scientific community has about breath testing. Don't allow the supervisor to air his or her opinion during cross—he or she can do that during any redirect with the State.

Finally, realize that most jurors in DWI trials do not have a scientific background and can easily get lost if the testimony bogs down in complex scientific areas. I have found that jurors are better persuaded when you present several points in a simple and concise fashion. For example, you can argue that this machine could eliminate one of its major flaws if it simply included a means to measure one's breath sample—several other such machines used in other states already do this. You should demand more from the State.

## **2. Attack the breath test from the very start of trial.**

The State will present the breath test result in your case as a very reliable indicator of intoxication. Your job is to dispel this notion of accuracy and illustrate the many problems inherent with this machine. Ultimately,

just like the field sobriety tests, the breath test is at best an indicator of alcohol consumption.

It is critical to explore your panelists feelings and knowledge of breath testing during voir dire. You must begin to plant the seeds of doubt about the breath testing machine from the very beginning. You can use any electronic device that would be found in most households and ask if they always functioned perfectly. You should ask them if they always trusted the readings on these devices—especially when their own senses told them otherwise. Do they blindly accept what the machine says, or do they challenge questionable results? You should then ask them how important it would be to question these results if it involved something important, like their health or safety. How critical of these results would they be then? The breath test result in your case is no different. They should look at it critically and challenge information that offends their common sense. Remember, most jury charges admonish juries not to forget to use common sense. Therefore, jurors should not blindly accept the State’s “science” regarding breath test reliability.

At the end of your trial, you need to be in a position to argue effectively that this machine is at best a very good indicator of whether your client had been drinking. However, it is not the highly accurate device the State would have them believe it is. There are too many areas where it could have failed, and the facts of your case substantiate that point.

### **3. The Intoxilyzer 5000 machine.**

The State of Texas uses the Intoxilyzer 5000 manufactured by a company named CMI, and has been using this 5000 series with several changes for many years. CMI has modified the 5000 series to correct problems with the machine. Most supervisors of the breath testing programs, however, will usually testify that these changes were made to address theoretical problems. Rarely will you be able to get them to admit a prior 5000 unit was faulty because that would impugn prior test results and testimony by the very same supervisor. You should later argue to the jury that while the manufacturer continues to correct the machine—and is rolling out a new series—the technique and testing of blood samples is still much the same as it was years ago. (If your jurisdiction allows the individual to

submit a blood sample, in lieu of breath testing, you may not want to argue this.)

The machine looks very much like a computer, a machine that many people know breaks down and malfunctions all of the time.



**Intoxilyzer 5000**

Photo of the Intoxilyzer 5000 taken from the CMI website.

CMI is now producing a new 8000 series to replace the 5000. The State would argue that the 5000 is fine and that the 8000, if it replaces the 5000, will only be a normal upgrade much like the modifications made to the 5000 over the years. You should attack this notion and point out that what the manufacturer is actually acknowledging that the machine does have problems and they are trying to fix them—just as it has done in the past when it added additional filters to the model 5000, for instance.

#### **4. Significant areas of concern with the Intoxilyzer 5000**

##### **A. Temperature**

The science behind the Intoxilyzer 5000 makes several important assumptions. One of these is the temperature of the test subject's breath. The machine assumes that all breath given is the same temperature, 34 degrees C or 93.2 degrees F. This is not true. Breath temperature varies from person to

person. As little as a 1.8 degree F increase in breath temperature can inflate a breath test result by up to 7%.<sup>6</sup> Moreover, individual's own breath temperature can fluctuate throughout the day.

The Intoxilyzer 5000 cannot compensate for this although other breath test machines available on the market do. In fact, because of very problem, other states stopped using this machine. About ten years ago, for example, Alabama concluded that the Intoxilyzer 5000 was misstating test results. Their findings, showing an error of up to 25% with drivers who had elevated breath temperatures, caused that State to adopt another machine. That machine measures the breath temperature and adjusts the test result in favor of the driver when the temperature is higher than normal.

#### B. Partition Ratio

The Intoxilyzer assumes that your client has a particular partition ratio. The machine assumes a ratio of 1:2100. This is the ratio of blood to air. This ratio is necessary to convert the concentration of alcohol the machine measures from the breath sample back to what is supposed to be present in your client's blood. Studies show, however, that that ratio can vary as far as 1:1700 to 1:2400, leading to as much as a 20 % false increase in the breath test result! Your supervisor will explain that statistically speaking, the vast majority of individuals fall close to the 1:2100 ratio. He or she might even testify that the true average for the partition ratio is higher, so the breath test is actually lower than it should be.<sup>7</sup> However, he or she cannot testify if that is true for your client.

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<sup>6</sup> Breath Tests for Blood Alcohol Determination: Partition Ratio, Srikumaran K. Melethil, Ph.D., professor of pharmacology at the University of Missouri at Kansas City [www.forensicevidence.com/site/Biol\\_Evid/Breath\\_Tests.html](http://www.forensicevidence.com/site/Biol_Evid/Breath_Tests.html); See also A.W. Jones, "Variability of the Blood: Breath Alcohol Ratio in Vivo," *Journal of Studies on Alcohol*, vol. 39, No. 11, 1978.

### C. Hematocrit levels

Lower hematocrit levels can inflate test scores by up to 5%.<sup>8</sup> The above partition ratio assumes an average hematocrit of 47%.<sup>9</sup> However, these values vary in both men and woman.

### D. Breathing patterns and Lung Physiology

Dr. Michael P. Hlastala points out that the science behind breath testing machines is outdated and incorrect.<sup>10</sup> He reviewed advances in pulmonary physiology that call the theory behind BT machines into question. In addition, changing one's breathing patterns can have a significant effect on the BT result. For instance, a person who hyperventilates can decrease the BT result by as much as 11% while holding one's breath can actually increase the result by up to 16%.<sup>11</sup> Moreover, blowing for a long time could increase the BT result.<sup>12</sup>

### E. Burping, regurgitation, reflux

The Intoxilyzer assumes that a valid BT sample is only influenced by alcohol found in the air coming from the lungs. The BT operator is supposed to observe your client for 15 minutes prior to administering the test. Interestingly enough the NHTSA Student Manuel states that one should wait at least 15-20 minutes to eliminate the possibility of mouth alcohol.<sup>13</sup> This is done to eliminate the possibility of mouth alcohol that is the product of burping regurgitation, reflux, etc. Already, this is an admission that mouth alcohol can influence a BT result.

The BT program itself recognizes that this is a significant problem because this mouth alcohol coming from the stomach is much more concentrated than that coming from the lungs—about a 1:20 ratio instead of 1:2100. Over the past 15 years, courts—being accustomed to this machine—have relaxed the standard of review for this observation period. Now, mere

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<sup>8</sup> Id.

<sup>9</sup> Id.

<sup>10</sup> Hlastala ,WHY BREATH TESTS OF BLOOD-ALCOHOL DON'T WORK. This article can be found on the Web at: [www.mphlastala.com/NYSBA%2001.pdf](http://www.mphlastala.com/NYSBA%2001.pdf)

<sup>11</sup> Hlastala, "The Alcohol Breath Test — a Review," *J. Appl. Physiol.* 84(2): 401-408, [1998]; can be found on the web at <http://jap.physiology.org/cgi/content/full/84/2/401>

<sup>12</sup> Edward F. Fitzgerald, *Intoxica-tion Test Evidence*, 2d ed., §32:13, at 32-14-32-15 (1995).

<sup>13</sup> NHSTA Student Manuel, February 2006, p. VII-8.

presence in the room even while writing an offense report or conversing with another officer suffices as long as the officer will testify that he was paying attention to the subject, that he or she could hear if the subject belched, etc. Indeed, officers have been allowed to “observe” subjects even while driving! Talk about divided attention. Everyone has burped or had reflux before that no one else noticed because it was silent. So how is the officer supposed to hear or observe that if he or she isn’t actually watching your client? It doesn’t take much alcohol in the mouth to skew the test—which is precisely why this is a problem.

The BT supervisor will explain away this issue by telling the jury that the machine compensates for it. He or she will testify that the machine has a slope detector that will pick up on the presence of mouth alcohol. The idea is that the machine works by only testing alcohol coming from deep lung air, or from the alveoli in the lungs. This is the area in the lungs where the breath alcohol level is supposed to be closest to that found in the blood. The machine assumes that since there should be no alcohol in the mouth for a valid test, that the machine will see a gradual increase in the alcohol concentration until it levels off to a plateau. This plateau is supposed to be the deep lung air. Essentially, if the slope detector does not detect this sloping increase, it is supposed to invalidate the test. However, what evidence is there that this slope indicator is calibrated or tested independently? What if a small amount of alcohol remained in the mouth after a belch? Because of all of the other variations and margins of error allowed by this machine, you can argue that the numbers keep adding up falsely against your client.

#### F. Diabetics and smokers

Diabetics with low blood sugar can have high levels of acetone that intoxilyzers can view as alcohol. Even individuals on diets can have abnormally high levels of acetone causing a similar problem.<sup>14</sup> In addition, smokers are likely to have much higher levels of acetaldehyde—a by product of alcohol—in their lungs, which

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<sup>14</sup> Frank and Flores, “The Likelihood of Acetone Interference in Breath Alcohol Measurements”, 3 Alcohol, Drugs and Driving 1.

can also be viewed as alcohol.

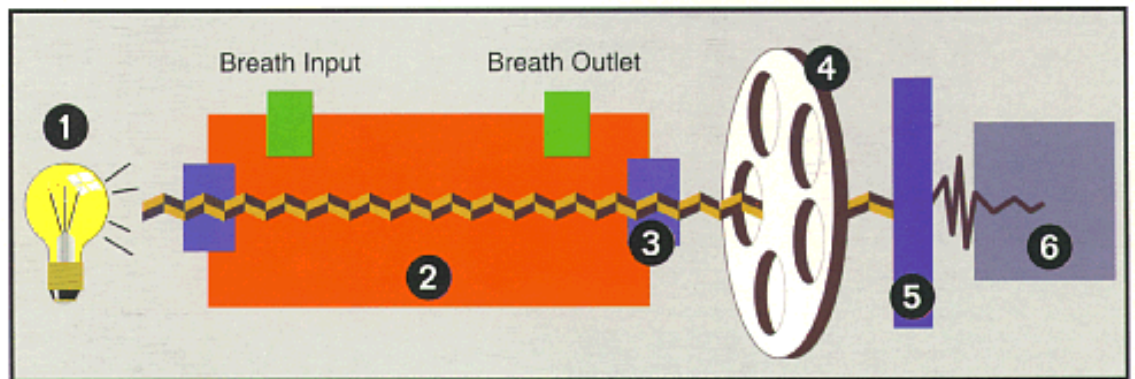
The intoxilyzer 5000 is supposed to have filters to keep these out. The NHTSA Student Manuel recognizes these contaminates. NHTSA Student Manuel, February 2006, p. VII-9

## 5. “For want of a light bulb...”

### A. How the Intoxilyzer works:

The theory behind the machine is that it measures the alcohol concentration by passing light through the breath sample. The greater the interference—or number of alcohol crystals present—the higher the alcohol concentration. See Appendix B, for CMI’s explanation of how the machine works.

The following is a diagram from the CMI website:



*The Intoxilyzer 5000 measures the degree alcohol absorbs infrared energy...the more alcohol present, the greater the absorption. As shown, a quartz lamp (1) generates IR energy which travels through a sample chamber (2) containing the subject's breath. Upon leaving the chamber, a lens (3) focuses the energy onto the chopper wheel (4) containing three or five narrowband IR filters. The IR energy passed by the filters is focused on a highly sensitive photo detector (5) which converts the IR pulses into electrical pulses. The microprocessor (6) interprets the pulses and calculates the Blood Alcohol Concentration which is then displayed.*

The intensity of the bulb actually affects the result. If the bulb isn't burning as brightly, then the test result could be artificially

high. This is so because the dimming of the light would lead the machine to believe that there are additional alcohol crystals occluding the light. These bulbs are supposed to be changed on a regular basis so such a thing doesn't happen. How often is this done? Are the bulbs actually inspected to ensure 100% reliability? From experience, we all know that light bulbs do not always last the same amount of time. This can be because of manufacturing conditions or from the manner of use. Are they always changed on schedule? Are the schedules sufficient for locations that have high numbers of tests done? Hospitals change the batteries in all of their critical devices before every procedure. Shouldn't we expect the same here?

Your supervisor should testify that the bulbs are routinely changed and tested. However, they do not normally take into account a heavy period of use for the machine. Rather, the replacement schedule assumes a steady number of tests during each period. This point is effective for cases where the machine is used a lot during high arrest times (holidays, fiesta, etc.).

#### *B. Fateful Reliance?*

In the end: this machine relies on a light bulb. Regardless of what the supervisor says, most jurors fixate on this point. The above CMI diagram was clearly designed to dumb down the technology behind the machine and allow juries to understand the basic principals. However, the fact that they have an iconic light bulb in the diagram should leave many jurors uneasy. This point is best used only during closing statement. Your technical supervisor will be prepared to allay jurors' fears should he or she be given the chance.

### **6. Absorption vs. Elimination?**

Despite the lack of scientific proof or perhaps even in direct contradiction to the facts of your DWI case, your BT supervisor will testify that almost all subjects are in the elimination stage when giving a BT sample. One study

actually indicated the opposite of this.<sup>15</sup> If anything, the science tells us we really don't know without a lot more information.<sup>16</sup> If pressed, the BT supervisor will have to agree with you. Short of taking several tests over a period of time, he or she can't say whether your client is in the elimination or absorption phase.

Ironically, in order to extrapolate with any degree of certainty back to what your client's BAC would have been, you must rely on what your client says while being arrested or at trial. Either way, you can expect the State to view your client's version with skepticism if it assists him or her. In the appropriate case, you should point out your client's only foray into the court system—so why is he or she suddenly untrustworthy? Ultimately, in a DWI trial, the jury is going to need to like or sympathize with your client.

You would need to know a variety of factors to begin to extrapolate with any degree of certainty: what was drunk, when, how much, how fast, when and what did your client last eat, etc. More intangible factors include your client's tolerance to alcohol and his or her rate of metabolizing alcohol. Virginia Tech, among other Universities, provides a helpful chart in this regard. See Appendix C

Most BT supervisors will testify that a person eliminates .020 g/100ml per hour while only absorbing .010 g/100ml per hour. The general idea is not it is harder to extrapolate down versus up. Once again, this simply isn't supported by the studies.<sup>17</sup> This would mean someone with an empty stomach could ingest 10 shots of tequila quickly and get in his or her car and drive away legally sober an hour later. Most jurors would frown on this.

## **7. Allowed Variance in BT samples—a statistical Grand Canyon.**

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<sup>15</sup> Simpson, G. Accuracy and Precision of Breath Alcohol Measurements for Subjects in the Absorptive State, *Clin. Chem.* 33/6 753-756 (1987); can be found on the Web at [www.clinchem.org/cgi/reprint/33/6/753](http://www.clinchem.org/cgi/reprint/33/6/753); Simpson G. "Accuracy and precision of breath-alcohol measurements for a random subject in the postabsorptive state" *Clinical Chemistry*, Vol. 33(2), 1987: 261-68.

<sup>16</sup> Stefan Rose, M.D., and Kenneth G. Furton, Ph.D., Variables Affecting the Accuracy and Precision of Breath Alcohol Instruments Including the Intozilyzer 5000, found of the Web at [www.ridl.us/research/Variable\\_Affecting\\_Accuracy\\_Precision\\_of\\_Breath\\_Alcohol\\_Instruments\\_Including\\_Intozilyzer\\_5000.pdf](http://www.ridl.us/research/Variable_Affecting_Accuracy_Precision_of_Breath_Alcohol_Instruments_Including_Intozilyzer_5000.pdf)

<sup>17</sup> See Id.

The Intoxilyer 5000 program requires that your client give two “valid” breath samples to complete the test. This program allows for a variance of up to .02 g/100ml or 25% difference between the two samples based on a .08 g/100ml legal limit! Try finding any other machine or device that allows for such a large variance and is “scientifically” sound. Most people understand that polls are random samplings of a given population. Point out during voir dire that the margin of error given in most polls if done correctly is typically less than 4%. Yet we are going to let the State rely on a machine that is only accurate to 25%? This variance increases when you add onto this number the .01 g/100ml variance allowed for the testing of the known standard sample that is certified to be .08 g/100ml and is kept at the assumed the breath temperature of 93.2 F. Now you have a variance of over 37%! These numbers don’t even account for any other miscalculations because of breath temperature or varied partition ratios as discussed above, among others.

### **IN CONCLUSION:**

The intoxilyzer 5000 is a machine used by the State to prove a definite level of intoxication. In truth, it merely approximates the level of intoxication. Moreover, it can only do so with reference to the actual time your client took the test—some times hours after your client has been driving. Most all courts are going to continue to allow test results in even when testing occurs hours later. They will always allow it as relevant evidence—call it circumstantial evidence—to your client’s blood alcohol level at the time of driving. Eventually, I would assume that the manufacturer CMI will have all of the model 5000 units replaced with newer more portable units, such as the model 8000. Certainly, they would like to sell more units and the police would prefer to cut down on the delay between driving and testing.

With proper preparation and understanding of how the machine works with all of its shortcomings, you will be in a better position to demonstrate how inaccurate and unscientific the intoxilyzer really is.

## *Appendices:*

The following are several scientific articles that are very useful when cross-examining your particular breath test supervisor as well as some other websites with useful information to prepare you for your case with a breath test.

### *Appendix A*

Virginia Tech provides a helpful site for basic information on the absorption and elimination of alcohol from the body:

[www.alcohol.vt.edu/Students/alcoholEffects/intoxFactors.htm](http://www.alcohol.vt.edu/Students/alcoholEffects/intoxFactors.htm)

Brown University also provides a website with similar information:

[www.brown.edu/Student\\_Services/Health\\_Services/Health\\_Education/atod/alc\\_aayb.htm](http://www.brown.edu/Student_Services/Health_Services/Health_Education/atod/alc_aayb.htm)

### *Appendix B*

The following is taken verbatim from the CMI website in which the Manufacturer of the Intoxilyzer 5000 explains how the machine works:

#### **The Alcohol "Fingerprint"**

The basic premise of IR technology is that all things will absorb electromagnetic radiation in a unique and consistent manner. Molecular chemistry tells us that all substances, including the alcohol molecular structure, have a unique and consistent quality. Furthermore, the bond between one atom and another establishes that substance's sensitivity to various wavelengths of electromagnetic radiation and specifically, to infrared light energy. Since no two substances have the same molecular structure, it is possible to analyze or detect a substance's presence due to the manner in which that substance will absorb the various wavelengths of the infrared spectrum. This absorption or "sensitivity" is caused by the resonating of the molecular bonds when exposed to the infrared energy. The

IR energy is absorbed by these resonating bonds and is depleted. Therefore, it is possible to measure the amount of energy that is used, due to the unique and consistent manner in which it occurs. Since these bonds will resonate to different degrees at different wavelengths of IR light, a "fingerprint" of that substance's absorption or sensitivity to those wavelengths is created. This fingerprint is most commonly expressed in percent transmittance, which depicts the loss of IR light able to pass through the molecule.

### **See the Light**

When IR light of a particular frequency passing through a chamber with no alcohol present strikes a detector, a certain voltage level is created. This can be called X. As an alcohol sample is introduced into the chamber, some of the IR light is absorbed or attenuated. As the alcohol level in chamber increases, the amount of light able to pass through the chamber and strike the detector decreases. At the end of the sample, a very different amount of light is striking the detector creating a different level of voltage. This new level of voltage can be called Y. If the amount of IR light passing through the chamber with no alcohol present can be determined—X, and the amount of light passing through the chamber with alcohol present—Y—can be determined, the difference between the two will represent the concentration of alcohol in the breath sample. The more alcohol present, the greater the absorption.

In the Intoxilyzer<sup>®</sup> 5000 and 1400, a quartz lamp generates IR energy which travels through a sample chamber containing the subject's breath. Upon leaving the chamber, a lens focuses the energy onto a chopper wheel containing up to five narrowband IR filters. The IR energy passed by the filters is focused on a highly sensitive photo detector which converts the IR energy into electrical pulses. A microprocessor then interprets the pulses and calculates the blood alcohol concentration which is then displayed on the instrument.

## Appendix C

NHTSA offers a list of pro and con articles about HGN testing by officers. The list is below. It can also be found at the following weblink:  
[http://www.nhtsa.dot.gov/people/injury/enforce/nystagmus/app\\_f.html](http://www.nhtsa.dot.gov/people/injury/enforce/nystagmus/app_f.html)

## Appendix D

The following chart by . Dr. Kurt Dubowski, Ph. D., FAIC, member of the Committee on Alcohol and Drugs, National Safety Council can be useful in preparing you case. Particularly if your case involves a high BT result yet your client is not exhibiting the classic signs of intoxication as described below.

### **Stages of Alcohol Intoxication**

<b>BAC (mg/100 ml of blood or g/210 L of breath)</b>	<b>Stage</b>	<b>Clinical symptoms</b>
0.01 - 0.05	Subclinical	Behavior nearly normal by ordinary observation
0.03 - 0.12	Euphoria	Mild euphoria, sociability, talkativeness Increased self-confidence; decreased inhibitions Diminution of attention, judgment and control Beginning of sensory-motor impairment Loss of efficiency in finer performance tests
0.09 - 0.25	Excitement	Emotional instability; loss of critical judgment Impairment of perception, memory and comprehension Decreased sensory response; increased reaction time Reduced visual acuity; peripheral vision and glare recovery Sensory-motor coordination impaired Drowsiness

0.18 - 0.30	Confusion	Disorientation, mental confusion; dizziness Exaggerated emotional states Disturbances of vision and of perception of color, form, motion and dimensions Increased pain threshold Increased muscular coordination impairment Staggering gait; slurred speech Apathy, lethargy
0.25 - 0.40	Stupor	General inertia; approaching loss of motor functions Markedly decreased response to stimuli Marked muscular coordination impairment Inability to stand or walk Vomiting; incontinence Impaired consciousness; sleep or stupor
0.35 - 0.50	Coma	Complete unconsciousness Depressed or abolished reflexes Subnormal body temperature Incontinence Impairment of circulation and respiration Possible death
0.45 +	Death	Death from respiratory arrest