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Georgia Bureau of Investigation
Division of forensic sciences

2014 Revision B

Intoxilyzer 9000
Georgia operator's training

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INTRODUCTION

Since the dawn of the automotive age alcohol consumption has been inextricably linked to public safety. As early as 1904, investigators started to notice a growing link between the consumption of alcoholic beverages and motor vehicle involved fatalities. In the ensuing years, scientific research was successful in determining a direct correlation between a motorist's alcohol level and their risk of motor vehicle fatality. This ultimately culminated in the establishment of the first DUI legislation that directly defined permissible alcohol levels in the driving public in 1939. Once established, this legislation created a new challenge for law enforcement officers seeking to enforce it. Due to the fleeting nature of alcohol in the human body, the obtaining of search warrants for the timely collection of specimen became a limiting factor in the enforcement of DUI laws. To resolve this problem New York state passed the first Implied Consent law in 1953. This Implied Consent law conditionally granted driving privileges to the motoring public in exchange for implied consent to test their blood, breath, or urine for alcohol if probable cause existed to believe they were DUI.

In order to protect the motoring and boating public Georgia has passed its own DUI and Implied Consent laws that can be found in Titles 40 and 52 of the Official Code of Georgia Annotated (O.C.G.A.). Some of the laws directly pertaining to DUI are as follows:

O.C.G.A 40-5-55: Georgia's Implied Consent Law

This law states that any person who operates a motor vehicle on the roads of Georgia and is arrested for the offense of DUI shall be deemed to have given consent to chemical testing. in order to determine if they are driving under the influence.

O.C.G.A 40-5-67.1: Georgia's Implied Consent Notice.

This law defines the warning read to motorists arrested for DUI informing them of the Implied Consent Law.

O.C.G.A 40-6-391: Georgia's DUI Statute.

This law defines driving under the influence in Georgia.

O.C.G.A 40-6-392: Chemical Testing Statute.

This law defines the requirements for chemical tests performed in conjunction with the Implied Consent and DUI statute.

O.C.G.A 40-1-1: Title 40 Definitions.

This statute defines alcohol concentration in terms of blood and breath pursuant to chemical testing.

Under O.C.G.A. 40-6-392 the legislature has established the methods by which these chemical tests requested as part of a DUI arrest must be performed. This statute requires that the Georgia Bureau of Investigation:

- Approve satisfactory techniques and methods to ascertain the qualifications and competence of individuals to conduct analyses
- Issue permits to conduct analyses
- Issue requirements for properly operating and maintaining testing instruments.
- Issue certificates that instruments have met the approval requirements of DOFS.

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In conjunction with this authority and obligation, the GBI-DOFS adopted the Rules and Regulations governing Implied Consent - GBI Rules 92-3 (Appendix A). In accordance with this authority, the Director of DOFS has approved breath alcohol testing as an acceptable procedure for alcohol analysis when performed by a certified operator on an approved breath testing instrument.

Pursuant to GBI Rule 92-3:

(12)(a) The methods approved by the Division of Forensic Sciences for conducting an evidential breath alcohol analysis shall consist of the following:

(1) the analysis shall be conducted **on an approved instrument** as defined in 92-3-.06 (5).

(2) the analysis shall be performed **by an individual holding a valid permit**, in accordance with Rule 92-3-.02 (2); and

(3) the testing **instrument shall have been checked periodically for calibration and operation**, in accordance with Rule 92-3-.06 (8)(a);

In 2012 the GBI made modifications to GBI Rules 92-3 in order to adopt the use of the Intoxilyzer 9000 as an approved testing device for evidential breath testing.

Pursuant to GBI Rule 92-3-.06:

(5) Breath tests other than the original alcohol-screening test shall be conducted on a breath alcohol analyzer approved by the Director of the Division of Forensic Sciences or his or her designee. Any other type of breath alcohol analyzer not specifically listed in this paragraph must be approved by the Director of the Division of Forensic Sciences or designee prior to its use in the State.

(a) **The Intoxilyzer Model 9000 manufactured by CMI, Inc. is an approved instrument for breath alcohol tests conducted on or before December 31, 2015;**

(b) **The Intoxilyzer Model 9000 manufactured by CMI, Inc. is an approved instrument for breath alcohol tests conducted on or after January 1, 2013;**

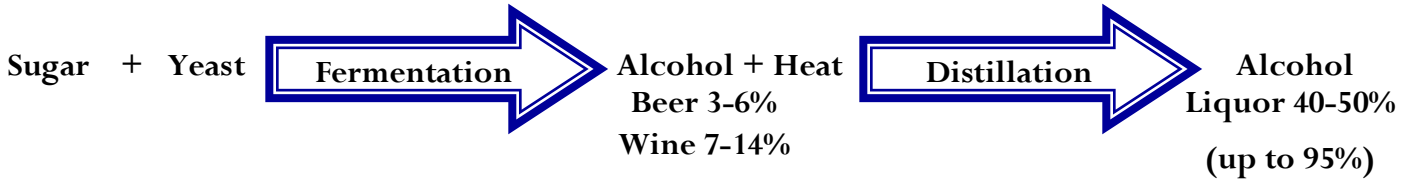
Thus the state of Georgia is now in the process of transitioning from the use of the Georgia Model Intoxilyzer 5000 to the Georgia Model Intoxilyzer 9000 as the sole evidential breath testing instrument used throughout the state of Georgia.

CMI Inc.

INTOXILYZER® 9000

INTRODUCTION TO ALCOHOL

Though the term alcohol encompasses an entire class of chemicals that share common structural similarities, it is most often associated with a specific chemical called **ethanol** or **ethyl alcohol** that can be found in alcoholic beverages . The common names for ethanol are **drinking or grain** alcohol. This name is given to ethyl alcohol, because under the right conditions some yeast species can ferment the sugars found in various grains to produce ethyl alcohol. **Fermentation** of grains, fruits, vegetables, and sugars are the primary sources of alcohol we find in beers, wines, and liquors today. After fermentation this alcohol can be concentrated through a process of evaporating and re-condensing called **distillation**.



The strength of an alcoholic beverage is often measured using the **proof** system. One half of the proof value is the percentage of alcohol. For example: a 100 proof liquor is 50 % ethyl alcohol (100 ÷ 2 = 50). The highest proof beverage likely to be encountered in a DUI situation is 180 proof or 90 % ethyl alcohol and is known by trade names such as Everclear™ or Golden Grain™. 200 proof or 100 % ethyl alcohol exists but is very expensive and will not normally be seen outside of a laboratory. As a reference, beers typically contain 3 - 6 % alcohol, wines 7- 14 % alcohol, and liquors 20 - 90 % alcohol. While different types of alcoholic beverages contain different amounts of alcohol, most standard serving sizes are adjusted to deliver a standard amount of alcohol. The **standard drink** typically contains about **0.6 fluid ounces** of ethyl alcohol which is roughly equivalent to the amount of alcohol in one regular 12 floz beer, one 5 floz glass of wine, or 1.5 floz of 80 proof liquor. In addition to ethyl alcohol, most alcoholic beverages contain other compounds called congeners which are largely responsible for the beverage's distinctive odor. These congeners are also thought to be responsible for many of the "hangover" effects associated with acute alcohol consumption.

Beverage	Avg. Alcohol Content	Typical Content Range	Sugar Source	Production Method	Std Serving size
Beer	3-6%	3-14%	Barley and Hops	Fermentation	12 floz / 5%
Wine	10-12%	7-14%	Grapes	Fermentation	5 floz / 12%
Whisky	40% / 80 proof	40-75%	Rye	Distillation	1.5 floz/ 40%
Brandy	40% / 80 proof	40-43%	Grapes	Distillation	1.5 floz / 40%
Vodka	40%/ 80 proof	40-50%	Potatoes	Distillation	1.5 floz/ 40%
Rum	40%-50%	40-95%	Sugar/Molasses	Distillation	1.5floz/40%
Tequila	40% / 80 proof	40-50%	Agave	Distillation	1.5 floz/ 40%
Gin	40%	40-50%	Juniper Berries	Distillation	1.5floz / 40%

Sometimes products other than alcoholic beverages such as over the counter medications or mouthwashes contain measurable amounts of ethanol for its antiseptic, solvent, or medicinal properties. While it is extremely unlikely that a person will attain a measurable blood or breath alcohol concentration when using these non-beverage products as the manufacturer recommends, abuse of these products can lead to alcohol related intoxication.

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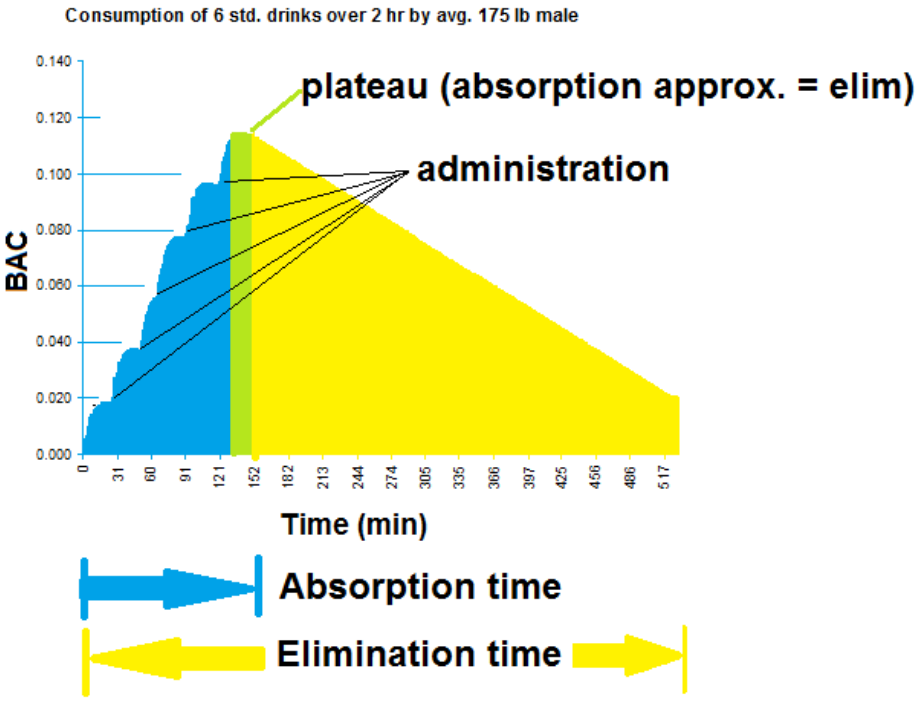
UNDERSTANDING ALCOHOL IN THE HUMAN BODY

When discussing the disposition of alcohol in the human body we must be aware that the alcohol concentration in an individual is dynamic or constantly changing. At any given time the alcohol concentration in a drinking individual is affected by four primary biological processes: **administration, absorption, distribution, and elimination**. Thus in order to have a fundamental understanding of the disposition of alcohol in the human body, we must have an understanding of how each of these processes affects alcohol level.



Administration

As we saw previously, there are numerous sources of alcohol that are available for human consumption. It is clear that **amount, type, and frequency** of alcoholic beverage consumption can effect blood or breath alcohol concentration. In addition, the **route of administration** may effect the fraction or the speed of alcohol delivery to the body. While oral consumption is by far the most common route of ethyl alcohol administration, alcohol can be administered by other routes such as inhalation or rectal administration.

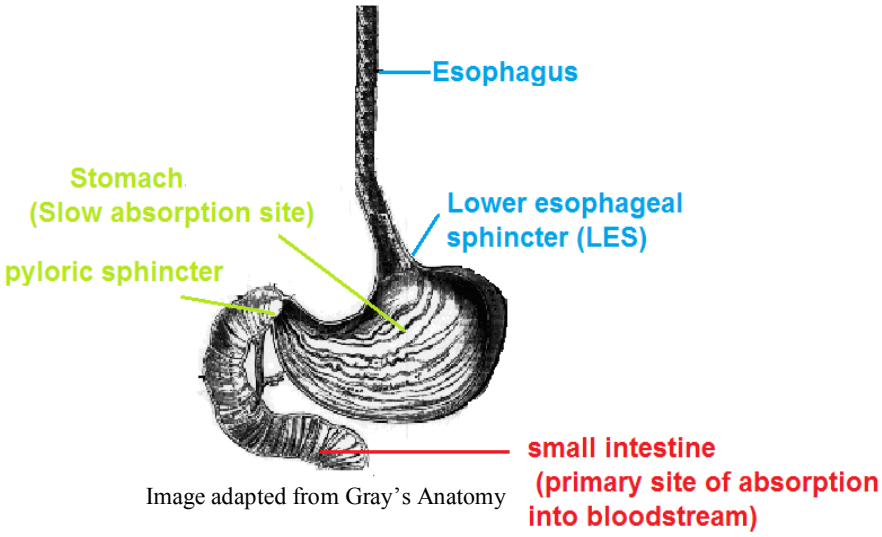
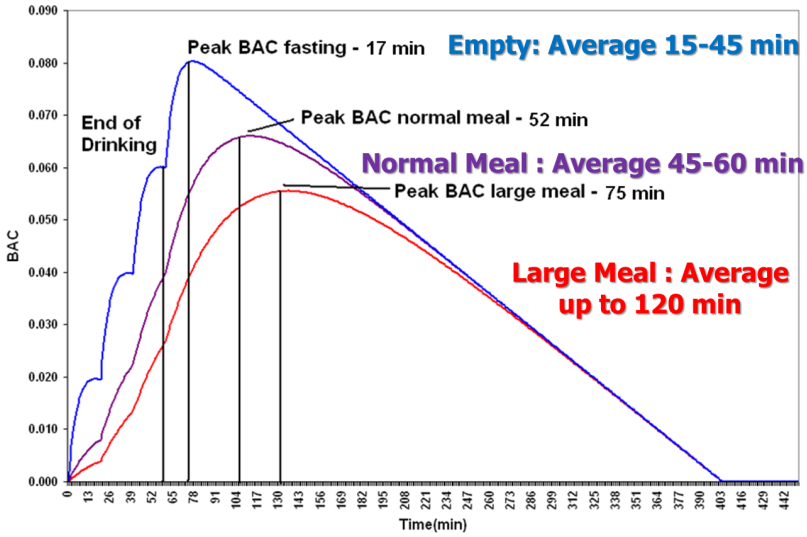


Image adapted from Gray's Anatomy

Absorption

Before alcohol can affect psychomotor or cognitive function it has to be consumed from some alcohol source and be absorbed into the bloodstream. This process of moving alcohol from the gastrointestinal system to the circulatory system is termed **absorption**. The time that it takes for alcohol to be completely absorbed into the bloodstream and for a peak alcohol concentration to be reached will vary depending on factors, such as, type and amount of food consumed with the alcohol, the quantity and strength of alcohol consumed, and the time interval over which consumption occurs. In addition, some physiological factors such as gastric surgery, disease, and drug use can affect the speed of absorption.



Time to Peak BAC vs. Stomach Condition

175 lb male - 4 std drinks over 60 min

The factor that generally has the largest effect on the rate of alcohol absorption is the amount and type of food in the stomach. On average a person consuming alcohol on an empty stomach will reach a peak alcohol concentration within approximately 30 minutes after the end of drinking; however, with a moderate amount of food present in the stomach the peak may be may not be reached until one hour after the conclusion of drinking. When a large amount of food is present in the stomach, it may take as long as two hours after alcohol consumption to reach peak alcohol concentration. In rare instances times to reach peak alcohol concentration have been reported in excess of two hours after the conclusion of drinking; however such cases are uncommon and are likely the result of disease or physiological abnormality.

Distribution

It is well understood that a person's BAC is directly related to the amount of alcohol they consume, but it is also largely affected by how the alcohol is distributed throughout the body. In reality only a small fraction of the alcohol consumed actually remains in the bloodstream after absorption. The majority of alcohol in the body distributes out of the blood into the water containing tissues and fluids. The movement of alcohol from the blood to the tissues and other water containing spaces of the body is known as the **distribution of alcohol.** The extent to which a person can distribute alcohol out of the bloodstream and intro the tissues will greatly affect the peak blood and breath alcohol concentration they reach. For the most part **alcohol will distribute evenly into the total volume of water found within a person's body**. Thus the greater the volume of water in a person's body, the greater the amount of alcohol that will distribute out of the blood stream and the lower the resulting BAC will be. This being said very few things can cause rapid significant changes in the total amount of water in the body without endangering a person's health. Because most lean tissues are more than 70% water, the primary factors affecting the distribution of alcohol in a drinking subject are the **weight** of the subject and the **body fat percentage** of the subject. An average healthy male is about 60% water by weight; however, this may vary slightly in proportion to his body fat percentage because fat is almost completely devoid of water. This means that two people of the same weight who consume the same amount of alcohol may not reach the exact same BAC if the volume of water into which they distribute that alcohol (or **volume of distribution)** differs. Ultimately the factor that has the largest effect on the distribution of alcohol for a person of a given weight is **body fat percentage** because it is highly correlated to the percentage of the body mass that is composed of water. The average body fat percentage for males is about 14-18%, and the average body fat percentage for females is about 23-29%. Thus we would expect women on average to exhibit lower volumes of distribution (Vd) than men of the same weight. The correlation between average body fat percentage, weight, and peak BAC can be seen in the illustration below.

	3 drinks		4 drinks		5 drinks	
Weight (lb)	Male	Female	Male	Female	Male	Female
100	0.132	0.154	0.176	0.206	0.220	0.257
110	0.120	0.140	0.160	0.187	0.200	0.234
120	0.110	0.128	0.147	0.171	0.184	0.214
130	0.102	0.119	0.136	0.158	0.169	0.198
140	0.094	0.110	0.126	0.147	0.157	0.184
150	0.088	0.103	0.117	0.137	0.147	0.171
160	0.083	0.096	0.110	0.128	0.138	0.161
170	0.078	0.091	0.104	0.121	0.130	0.151
180	0.073	0.086	0.098	0.114	0.122	0.143
190	0.070	0.081	0.093	0.108	0.116	0.135
200	0.066	0.077	0.088	0.103	0.110	0.128

Avg male = 17% body fat (Vd = 0.7L/kg)

Avg female = 29% body fat (Vd = 0.6 L/kg)

*This chart does not account for alcohol elimination.

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Elimination

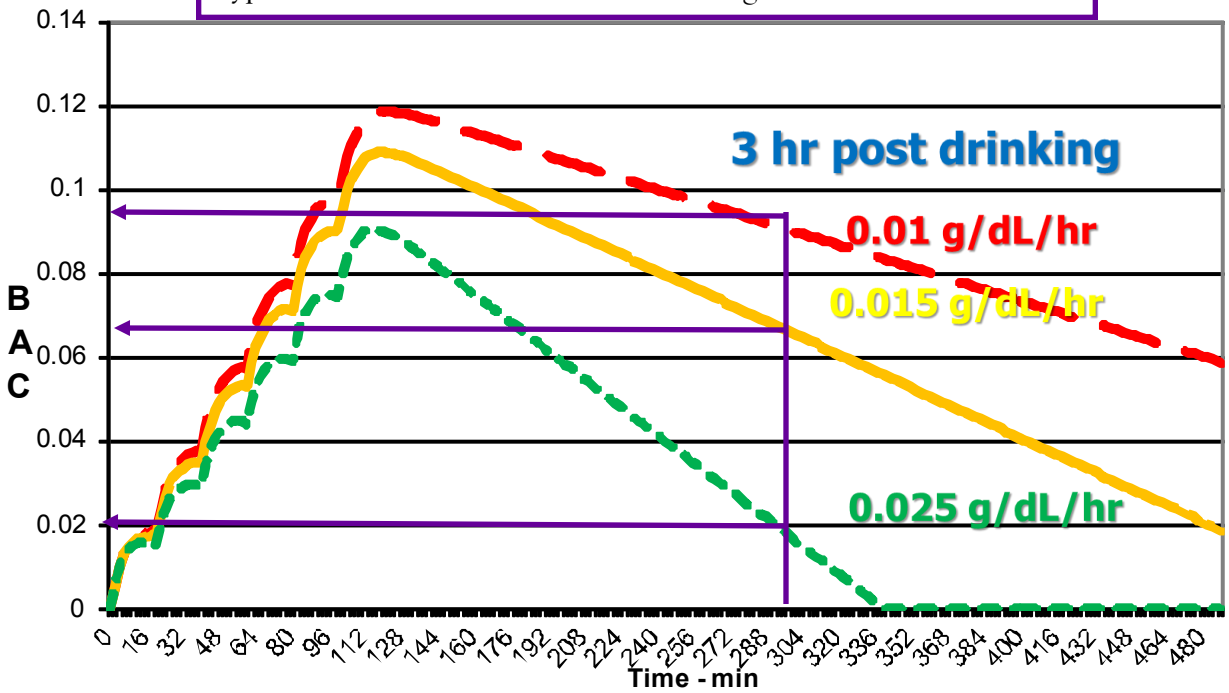
Almost immediately after the consumption of alcohol, the process of removing alcohol from the body, known as **alcohol elimination,** begins. This is accomplished through an enzymatic conversion process called metabolism and excretion of alcohol into fluids or gases leaving the body. **Metabolism** is the process by which some compounds in the body are chemically changed so that they are less toxic to the body, more useful to the body, or more easily eliminated. The majority of alcohol that is consumed is eliminated by the **liver** through metabolism by the enzyme alcohol dehydrogenase (ADH). The ADH enzyme converts ethanol to acetaldehyde, which is ultimately further converted by a series of other enzymes to carbon dioxide and water. During each pass through the liver, more alcohol is metabolized until there is no alcohol remaining in the bloodstream. Metabolism in the liver typically accounts for the elimination of **90% to 95%** of the alcohol consumed. The remaining alcohol is primarily eliminated through excretion into bodily fluids and gases such as **urine (2-5%), breath (2-5%)**, and **sweat (<1%)**. It has been established that a small amount of alcohol metabolism takes place in the stomach before it is absorbed into the bloodstream, though the exact magnitude of this metabolism in the gastric mucosa is still debated. Even if the maximum estimates are assumed, this would only amount to the elimination of about one third of a standard alcoholic beverage from the stomach over a one hour period of time.

The rate of elimination tends to be fairly constant for an individual, but will vary within a narrow range for a population of subjects. Approximately 95% of the normal population have a rate of elimination that falls within the range of 0.010 to 0.025 grams per 100 ml (or dL) of blood per hour, while the **average rate of elimination for this population is about 0.015 grams per dL per hour**. Chronic alcohol abusers may exhibit elimination rates as high a two to three times that of a normal individual due to the development of pharmacodynamics or metabolic tolerance. Chronic alcohol abuse over long periods of time typically results in liver damage and the development of cirrhosis of the liver, which may ultimately adversely affect normal liver function.

Elimination Rate Range	Where Seen	Frequency	Average Rate	Other Notes
< 0.01 g/dl/hr	People with abnormal liver function	Very Uncommon	NA	NA
0.01 – 0.025 g/dL/hr	Non- to Social Drinkers	95% of the population	0.015 -0.018 g/dL/hr	Avg. Rate is frequency dependent
> 0.025 g/dL/hr	Heavy/ Chronic Alcohol Abusers	Less than 5% of the population	0.023 – 0.030 g/dL/hr	Reported rates as high as 0.05 g/dL/hr

Many times the average rate of elimination is used to estimate an alcohol level at some time interval prior to a test. This practice is known as retrograde extrapolation. There are many additional variables that must be taken into account before this should be undertaken and typically an operator should ***not*** consider any alcohol concentration other than the test result. For example, simple differences in elimination rate or beta within the normal population can cause significant differences in BAC in both the absorptive and elimination phases, even when all other factors are the same. (See following graph) In addition, the elimination rate becomes non-linear at alcohol concentrations less than 0.02, making any estimations involving low alcohol concentrations significantly more difficult to perform.

Hypothetical Model: 175 lb man consuming 6 std drinks over 2 hr.



Estimates of alcohol level in an individual based on alcohol consumption, weight, volume of distribution, and elimination rate can be made using an equation known as the Widmark formula. While this formula can provide accurate estimates when utilized by properly trained individuals, the results are only as accurate as the assumptions underlying the calculation. In reality there are many factors related to administration, absorption, distribution, and elimination of alcohol that can significantly add to the complexity of estimations of BAC. Thus in most cases the best estimate of a person's alcohol level is a properly executed chemical test performed as close to the time of arrest as possible.

Table of Select Factors Affecting Alcohol Level

Process	Factor	Relevant Factors	Impact
Administration	Amount	Strength of beverage	High
		Size of beverage	High
	Time of Administration		High
Absorption	Absorption Rate	Stomach Condition (empty vs full)	High
		Diet (type/amount of food consumed)	Moderate
		Diseases/ Pathologies	Varies
		Type of beverage consumed	Low
		Speed of consumption	Low
	Time Since Administration		High
Distribution	Body mass		High
	Volume of Distribution	Body fat percentage	Moderate
Elimination	Elimination Rate	Genetics and drinking frequency	High
	Time Since Administration		High

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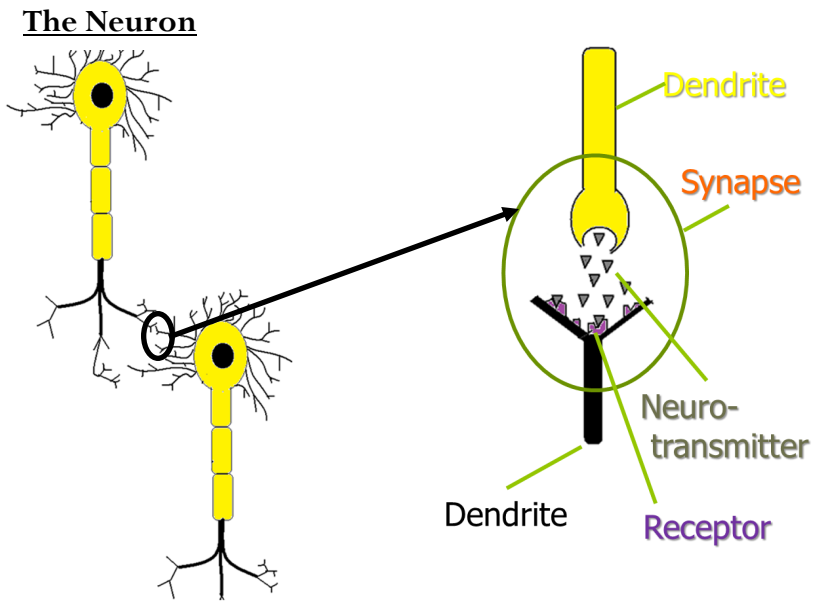
ALCOHOL TOXICOLOGY: ALCOHOL AND THE BRAIN

The nervous system is the information superhighway of the human body. The basic building block of the nervous system is a highly specialized cell called the **neuron**. This cell, which forms large communication networks, transmits nerve impulses throughout the body which control voluntary and involuntary processes. While neurons do not physically touch one another, they do chemically communicate at specialized junctions called **synapses.** In order to transmit nerve impulses across the synapse, the terminating neuron releases chemicals called **neurotransmitters.** These neurotransmitters trigger nerve impulses on the other side of the synapse by attaching to specific receptors on the surface of the post synaptic neuron.



Once alcohol reaches the **brain** it diffuses out of the bloodstream across the blood-brain barrier and starts to exert its effects. Consequently, alcohol related intoxication is closely correlated with the alcohol concentration in the arterial blood reaching the brain. Alcohol mediates its intoxicating effects by interfering with numerous **neurotransmitters**, as well as the membrane structure of the neuron. Thus alcohol slows, inhibits, and depresses the efficient transmission of nerve impulses which we recognize in an individual as intoxication.

Alcohol acts as a **depressant** in all individuals, and if consumed in sufficient quantity will lead to impairment of various physiological and cognitive functions. **Impairment** is simply a diminished ability to perform a particular task. Impairment due to alcohol consumption is both task specific and dose dependent. Between the limits of sobriety and lethality, it is logical to conclude that there exists some threshold level at which all individuals, even those habituated or highly tolerant to alcohol, will show detectable and measurable **impairment** in their ability to operate a motor vehicle safely. **For the purposes of determining if a person is driving under the influence**, **impairment refers to those manifestations which cause a person to operate a motor vehicle less safely than they would under normal conditions**.

In Georgia, non-commercial drivers 21 years of age or older are by definition or **per se** under the influence if their measured alcohol concentration is 0.08 or higher within three hours of driving from alcohol consumed before the driving ended; however, the per se alcohol concentration is 0.04 for commercial drivers and 0.02 for drivers under 21 years of age. Present day legal levels and inferences of alcohol influence are the result of almost one hundred years of research on the effects of alcohol and driving. This large volume of research on the effects of alcohol can be divided into three primary categories:

1. **Epidemiological studies** of alcohol involvement in traffic crashes and fatalities.
2. **Roadside studies** and **driving evaluations**.
3. **Controlled laboratory experiments** .

Alcohol related impairment can frequently be observed in the physical manifestations that a subject will display while under the influence of alcohol. The degree of impairment is largely proportional to the concentration of the alcohol in the subject's blood or breath. Due to this fact, different alcohol levels are typically defined as different **Stages of Intoxication**.

Stage	BAC Range	Typical Manifestations	Possible Driving Impairment	Other Comments
Near Sobriety	0.01-0.04	• Nearly normal appearance • Onset of judgment and attention impairment • Naïve task impairment	• Compensatory tracking impairment onset • Evasive maneuver / emergency braking impairment onset	• 50% of driving studies show impairment at alcohol levels 0.05 or less • Drivers under age 21 show significant elevation in crash risk at BACs above 0.02. (Peck, 2007)
Euphoria	0.03-0.12	• Euphoria • Increased self confidence • Increased sociability • Decreased inhibitions • Impairment of Judgment • Impaired divided attention • Onset of balance impairment.	• Impaired depth perception • Increased risk taking • Lack of judgment • Slowed reaction time • Slowed glare recovery • Difficulty maintaining lane and speed. (divided attention)	• 95% of driving studies show impairment by the time subjects reach a BAC of 0.08. • A BAC of 0.08 represents an increase in crash risk of approximately 300% (Grand Rapids Study, 1964)
Excitement	0.09-0.20	• Emotional Instability • Loss of critical thinking and judgment • Incoordination • Inertia/ Lack of balance • Slurred speech	• Difficulty accelerating smoothly • Braking errors • Signal/ control errors • Difficulty steering / curve taking	• 0.12-0.16 is the average BAC in DUI related fatalities • 99% of driving studies show impairment at alcohol levels 0.09 or less • A BAC of 0.14 represents an increase in crash risk of approximately 2000% (Grand Rapids Study, 1964)

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Stage	BAC Range	Typical Manifestations	Possible Driving Impairment	Other Comments
Confusion	0.18-0.30	• Disorientation and mental confusion • Gross incoordination • Slurred Speech • Staggering gait • Vomiting	• Numerous Effects • Driving off roadway • Driving wrong direction • Improper lane usage	• Increase in crash risk at 0.17 is 4,500%, and goes up exponentially. (Grand Rapids Study, 1964)
Stupor	0.27-0.40	• Apathy / Lack of muscle control • Inability to stand or walk • Loss of consciousness or memory • Loss of bladder control • Coma / Death	• Numerous Effects • Passing out behind the wheel	
Coma/Death	>0.40	• Coma/Death		

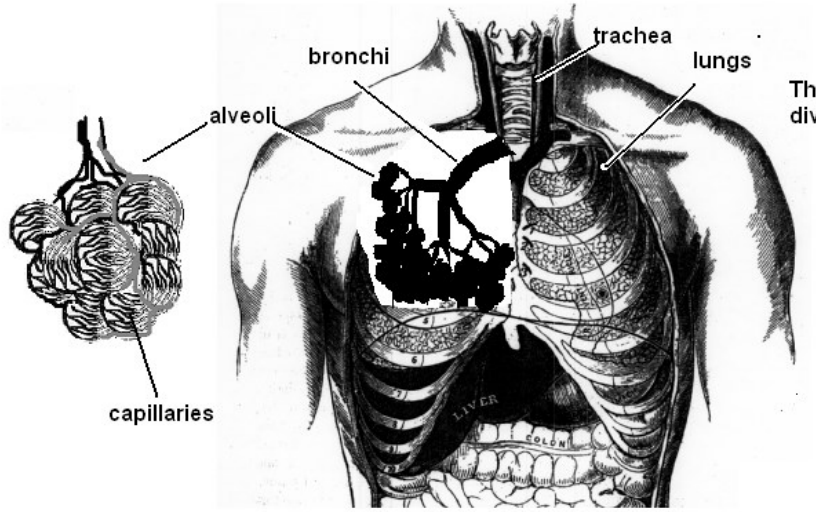
It should be noted that the degree to which certain impairing effects may be present at a particular alcohol concentration may vary from person to person based on an individual's **tolerance** to alcohol. **Tolerance** is the body's attempt to diminish or adapt to the frequent presence of large doses of alcohol by reducing or compensating for alcohol's impairing effects. While the body can exhibit some tolerance to alcohol through physiological changes such as increasing the elimination rate or desensitizing the nervous system, the most common form of tolerance to alcohol is a **learned or task dependent behavioral tolerance**. It is well known that if simple tasks are practiced repetitively while under the influence of alcohol, a tolerance with respect to those tasks can be developed. Thus people who regularly consume large doses of alcohol may show some **learned tolerance** to many of alcohol's impairing effects on simple tasks and may exhibit a relatively normal outward appearance at high alcohol levels. Unfortunately little to no tolerance is observed at significant alcohol levels with relation to many of the complex cognitive functions required for driving.

Tasks where Tolerance is Pronounced at Levels Greater than 0.08
Simple / Well Learned Tasks
Walking
Talking
Simple Motor Tasks
Simple Cognitive Tasks

Tasks where Tolerance has Little Effect at levels Greater than 0.08
Complex / Naïve Tasks
Judgment
Choice Reaction Time
Complex Divided Attention Skills

THE SCIENCE OF ANALYZING ALCOHOL IN BREATH

Respiration is the exchange of gases between an organism and its environment. In humans, respiration involves the absorption of oxygen from the environment and the elimination of carbon dioxide from the blood stream to support life. During respiration air is taken in through the mouth or nose and transported by the trachea or windpipe into the lungs. In the lungs, the trachea branches into smaller air tubes called bronchi which continue to branch and eventually terminate in small air sacs called **alveoli.** These alveoli are surrounded by capillaries and are elastic in nature. It is in these pulmonary alveoli that blood is able, by diffusion, to release carbon dioxide and absorb oxygen for use throughout the body. If alcohol is present in the blood, it too will diffuse across the **alveolar membrane** into the breath in a fixed proportion to the alveolar blood alcohol concentration and the core body temperature.



The respiratory system can be divided into six parts:

1. mouth
2. nasal cavity
3. pharynx
4. larynx
5. trachea
6. bronchi

image adapted from Gray's Anatomy

The chemical principle that governs the diffusion of gases between the blood and the breath in the pulmonary alveoli is **Henry's Law**. It states that the concentration of a material in the gas state above a liquid containing the dissolved material will be proportional to the concentration of the material in the liquid state. This law not only applies to experiments carried out in beakers and test tubes in the laboratory, but also to the human body. Specifically it applies to alcohol vapor (gas) in the lung in contact with blood (liquid) containing alcohol. Alcohol continuously diffuses across the **one cell thick semi-permeable membrane** of the capillaries into the air of the lung in proportion to its concentration in the blood. Ultimately, if given enough time, the breath alcohol concentration (BrAC) will reach a defined balance with the blood alcohol concentration (BAC) in accordance with Henry's Law. This balance is called **equilibrium**. At equilibrium, the relationship between the concentration of alcohol in the blood and the breath can be described by the **blood:breath ethanol partition ratio.** At 34 degrees Celsius, the average temperature of human breath, this blood:air ethanol partition ratio has been experimentally determined to be approximately 2100:1. This means that at 34 degrees Celsius there is the same amount of alcohol in 100 mL of blood as there is in 210 L of air in contact with that blood in a closed container. This assumes that the air within the container has had sufficient time to reach equilibrium with the liquid state. Thus, it is important to try to obtain an air sample from a subject that has reached sufficient **equilibrium** between the air in the lungs and the pulmonary blood.

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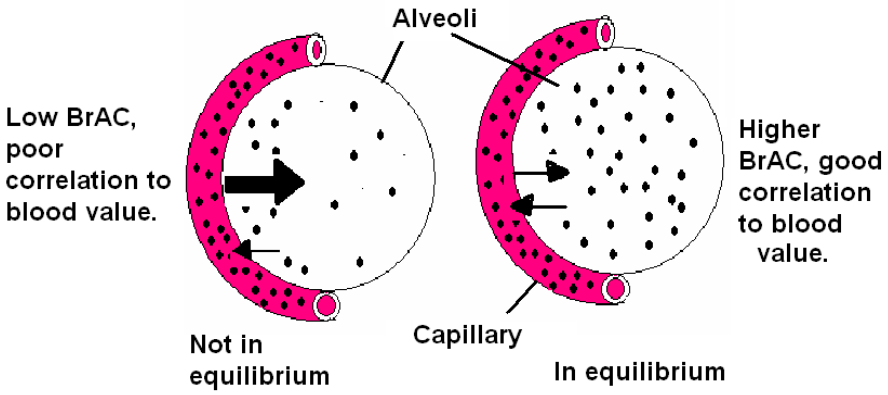
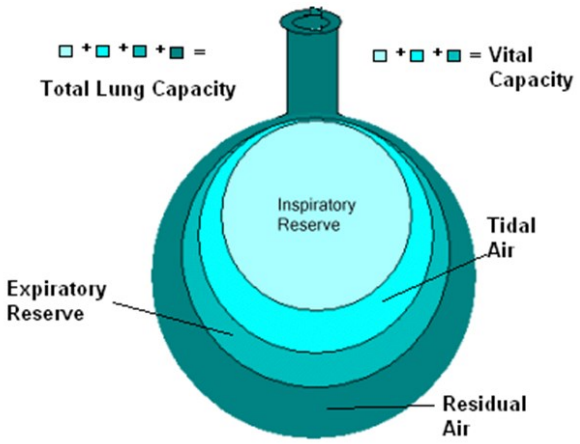


Air within the pulmonary alveoli reaches equilibrium fairly quickly after inhalation. However, because of heat, water, and thus alcohol loss to the airway during exhalation, the measured BrAC from a human subject rises during exhalation until relative **equilibrium** is reached with the airway surface resulting in a "**plateau**" in the BrAC. Air that remains in the lungs for the longest period of time has the best chance of having reached equilibrium with the pulmonary blood. Thus it is important to facilitate a **maximum exhalation** from a test subject to ensure the best chance of obtaining a breath sample that has reached relative equilibrium with the blood and airway. This type of air is typically classified as a type of air called **Expiratory Reserve**. Even if the subject delivers a maximum exhalation, the measured BrAC in g/210L will be on average 10-15% lower than their measured BAC in g/dL.

Capacity of the Human Lung



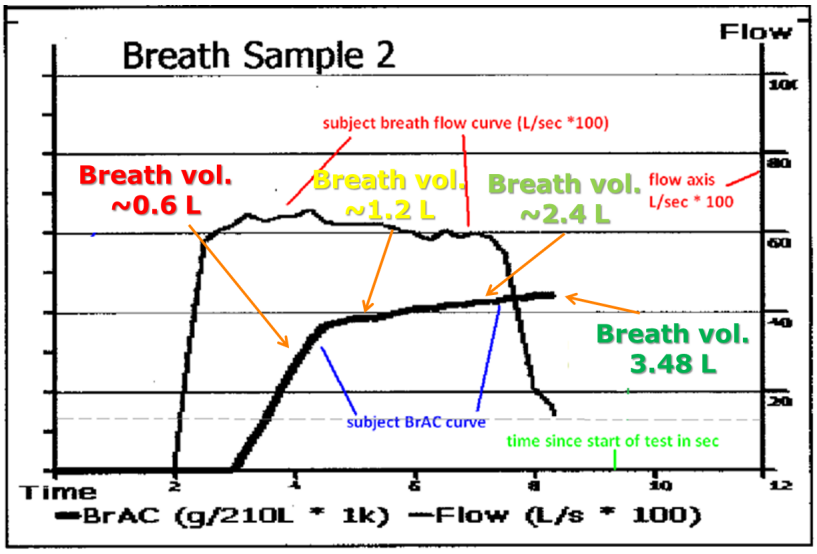
Tidal Air/Volume : volume of air utilized during normal breathing . Approx. 0.5L in normal subjects.

Inspiratory Reserve (IR) : volume of air that can be inspired after normal inhalation. Approx. 2 - 3 Lin normal subjects

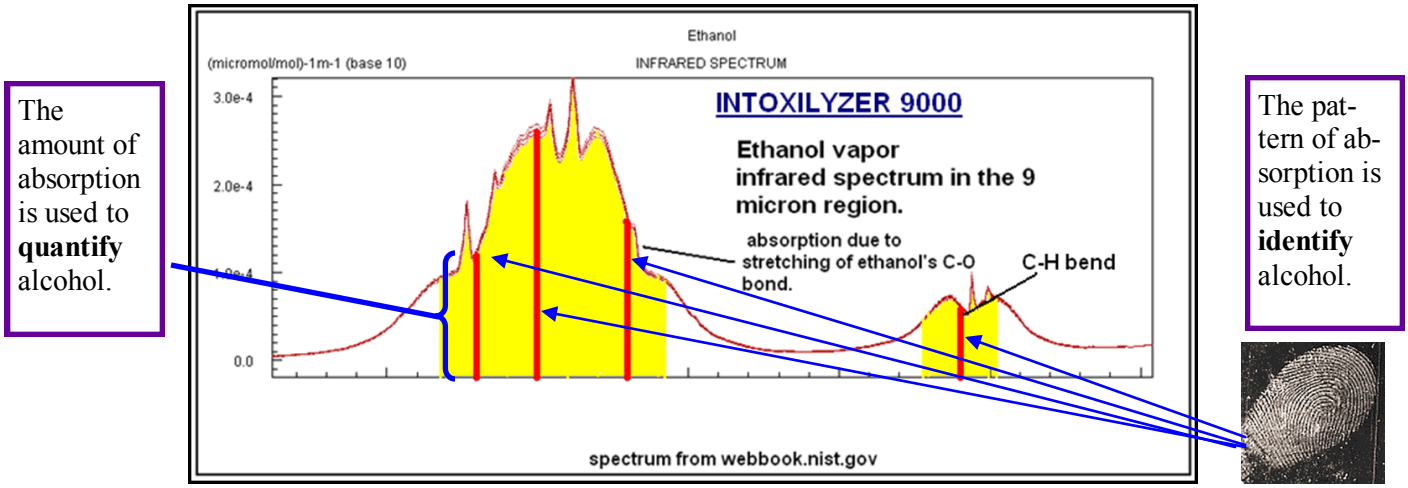
Expiratory Reserve (ER): volume of air that can be expired after normal exhalation. Approx. 1-1.5L in normal subjects

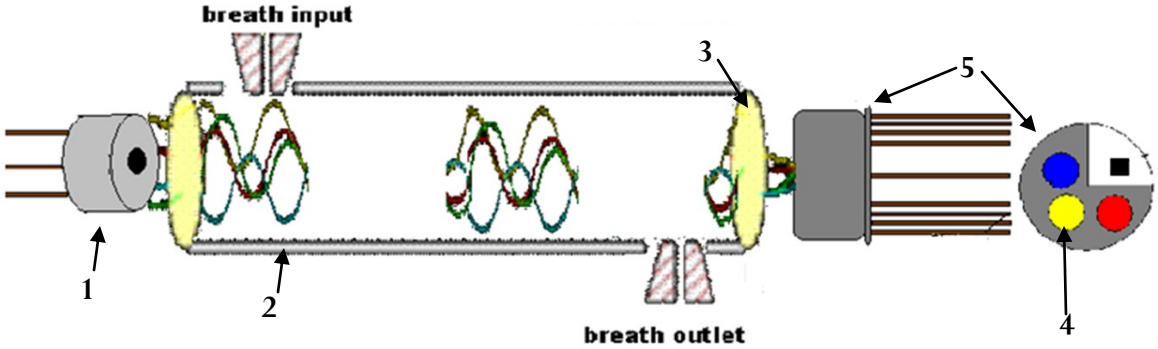
Residual Air/ Volume: Air remaining in the lungs after maximum exhalation. Approx. 1.0 L in normal subjects

Vital Capacity: Tidal + IR +ER. Approx. 3-5 L in normal sub-



Depending on their atomic and electronic structure, molecules **absorb** energy (light) of well defined **wavelengths**. For molecules, the relative intensity of infrared light absorption at different wavelengths functions as a molecular "fingerprint" specific to a given molecule. Thus, by evaluating the relative intensity of absorption at specific wavelengths of infrared light we can specifically identify ethyl alcohol and differentiate its infrared response from other volatile compounds. Additionally, by measuring amount infrared light absorption at specific wavelengths, we can use a standard **differential absorption technique** to determine the amount of a given molecule in a sample. The Beer-Lambert Law dictates that the quantity of light absorbed will always be proportional to the concentration of the molecule in solution. This is the physical principle the Intoxilyzer™ 9000 uses to determine the amount of alcohol in a breath sample.





The heart of the Intoxilyzer™ 9000 is its **optical or analytical bench** (see Diagram above). At one end of the bench, an **infrared source (1)** is generates light the infrared region of the spectrum, which is pulsed through the sample chamber at a defined frequency. In the sample chamber (2) the infrared light is allowed to interact with a breath sample. If the breath is alcohol free, the infrared light should pass through the sample chamber freely; however, if alcohol is present specific frequencies or wavelengths of infrared light will be absorbed. At the opposite end of the sample chamber, a **lens** (3) focuses the energy (light) onto an infrared energy (light) **detector (5).** Prior to it reaching the detector, the infrared light is filtered by four single wavelength filters (4) that are integrated into the detector unit. Once the light passes through the filter and strikes the detector, the detector generates and electric signal proportional to the amount of light striking it. This signal it then transmitted to a **processing unit** that interprets the electrical signal**.**

Prior to the delivery of a breath sample, the instrument establishes a **zero reference point** by measuring the amount of energy (light) striking the detector when the sample chamber is filled with **ambient air**. During a breath test, as the amount of alcohol vapor in the sample chamber rises, the amount of infrared energy (light) reaching the detector falls relative to the zero point measurement. By determining the difference in the amount of energy (light) striking the detector between the two measurements, the instrument is able to mathematically calculate the breath alcohol concentration in the test sample. The instrument then analyzes at the relative response at each of the four detectors to confirm the identity of ethyl alcohol to the exclusion of other substances.

In summary, the Intoxilyzer™ 9000 measures the degree alcohol absorbs **infrared (IR) energy**...the more alcohol present, the greater the absorption. The instrument verifies the pattern of absorption to identify alcohol and the amount of absorption to quantify alcohol in a breath sample. The Intoxilyzer™ 9000 then prints the analytical result in **grams of alcohol per 210 liters of breath** as required by Georgia law.

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FOUNDATIONS FOR CHEMICAL TESTING

In order to obtain a chemical test result that will be useful in adjudicating DUI cases, law enforcement officers should be careful to consider several foundational principles when making decisions regarding events leading up to the chemical test. This will ensure that the arresting officer will properly meet both the legal and scientific criterion necessary for an admissible breath test. While exact procedures may vary from agency to agency, the minimal requirements are outlined in the following sections.

Step 1 - Stopping the Vehicle

The officer must have reasonable cause to stop the vehicle and briefly detain its occupants to investigate the circumstances that provided your suspicion. You must be able to articulate this cause at an OSAH hearing or trial proceeding. Other specific criteria govern roadblock situations.

Step 2 - Detention of the Person

Law enforcement officers may detain persons suspected of a crime for a brief period of time for the specific purpose of investigating their suspicions that a crime has been committed. During this time an officer may ask the detainee a modest number of questions to determine their identity and to try to obtain evidence confirming or dispelling the officer's suspicions. Officers may employee the use of field sobriety tests and portable breath testers (PBTs) when investigating the subject for DUI. Remember PBT results may only be used to legally establish the presence or absence of alcohol, not the subject's exact breath alcohol concentration. A detainee's participation in questioning or field sobriety tests is voluntary and can not in itself form the basis for arresting the subject. Unless the detainee's actions or answers give the officer **probable cause** to believe a crime has been committed, absent other evidence the subject must be released. It should be noted that the officer **does not** have to advise the driver of their **Miranda rights** when questioning a detained motorist prior to the point of arrest. The driver's pre-arrest statements and actions are admissible against them in any criminal proceedings.

Step 3 - Grounds for a DUI Arrest

In order to arrest a subject for DUI, the officer must have **probable cause** to think the driver who was in actual physical control of a moving vehicle upon the public roads and highways of this State or elsewhere throughout the State is under the influence as defined by OCGA 40-6-391. The grounds for the arrest must be articulated in any OSAH hearing or trial proceedings. Grounds for arrest may include factors such as the subject's driving, appearance, odor, behavior, ability to follow instructions, mental comprehension, performance on field sobriety tests, PBT results, and the officer's professional opinion that the subject is under the influence.

Step 4 – Arrest

The arrest is effectuated when the brief detention becomes a custodial situation. If a motorist who has been detained in a traffic stop thereafter is subject to treatment that renders him "in custody", you **must advise** him of his Miranda rights in order for his post-arrest statements or post arrest field sobriety evaluations to be admissible as evidence in a criminal proceeding. The treatment of a motorist at the scene of the stop is equivalent to a formal arrest when:

1. a reasonable man in the suspect's position would have felt that he was not free to leave, not whether the officer would have permitted him to leave.

2. the driver was detained for over one-half hour, absent exigent circumstances.

3. part of the detention is spent in the patrol car (for reasons other than safety, weather, etc.).

4. the officer persistently question the driver in a patrol car, resulting in a confession or other incriminating circumstances.

5. the driver is a minor and is denied permission to contact his or her parents or guardian. Once the officer has finished their investigation, they must determine whether they have **probable cause** to make an arrest for DUI.

Once the arrest is made, the officer will likely be required to testify about:

1. The basis of the arrest.

2. The circumstances of the arrest.

3. How the officer told the driver of the arrest and the charges.

4. How and when the officer read the driver the Implied Consent Warning.

5. What statements the driver made to the officer.

6. What statements the officer made to the driver.

Step 5 - The Implied Consent Warning

<u>After</u> the arrest is made, the appropriate Implied Consent Warning must be read as close to the point of arrest as possible. The Implied Consent card directly quotes Georgia's Implied Consent law and should be **strictly** adhered to. **Read** the Implied Consent card to the driver at the time of the arrest, not later, and bring it to the hearing or trial and read from it while testifying that you advised him of these rights. Do not attempt to advise the driver or testify from memory. Be sure to request that the driver submits to the test or tests you designate.

After reading the Implied Consent Warning, if the driver requests an attorney, clearly inform the arrestee that they **do not** have the right to speak to an attorney when deciding whether to submit to a chemical test. After the driver submits to the designated tests, the officer is **required** to make **a reasonable attempt to accommodate** any request made by the driver for an **independent test**. It is the responsibility of the driver to pay and make arrangements to have the independent test samples analyzed.

Step 6 – Refusal

The Implied Consent warning affords the arrested driver the opportunity to refuse chemical testing, if the officer does not pursue a search warrant. Refusals can be either verbal or non-verbal. In the event of a refusal, the officer must send a notice to suspend the driver's license within ten days of arrest to the Department of Public Safety . Note that as of January 1, 2012 the notice of suspension forms DPS1205 are no longer required to be notarized. The suspended driver may then request an administrative or OSAH hearing to determine whether sufficient grounds existed for the license suspension. Pursuant to OCGA 40-5-67.1 (g)(2) the scope of this hearing should be limited to:

1. Whether the officer had probable cause to believe the defendant was in violation of OCGA 40-6-391.

2. Whether the officer properly advised the defendant of their rights by reading the appropriate Implied Consent notice.

3. Whether the defendant refused the test **<u>OR</u>**

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3. Whether the test showed an unlawful drug or alcohol concentration **AND** whether the test was administered by a person possessing a valid permit on an instrument approved by the GBI with all of its parts attached and in good working order as prescribed by the manufacturer.

Georgia law requires that the driver be advised of his Implied Consent rights on the scene of the arrest. If the driver refuses the tests, you may not administer a chemical test to the subject unless the subject first withdraws their refusal or a warrant is obtained. Georgia courts have ruled the driver has the right to change his or her mind after a refusal and take the test later with no penalty under some circumstances (Howell v. State, 266 Ga App 480 and Dept. of Public Safety v. Seay, 206 GA App.71). Law enforcement personnel may ask a subject who refuses a chemical test if they would like to withdraw their refusal, but must be careful not to coerce the subject. As of 2006, OCGA 40-5-67.1 (d.1) allows for the obtaining of samples for chemical testing from a refusing subject by means of a properly executed search warrant.

Element	Met by
By someone possessing a valid permit	Introduction of Operator's permit
On an instrument approved by the GBI	GBI Rule 92-3 Installation letter (usually not necessary)
On an instrument with all of its parts attached and in good working order as prescribed by the manufacturer	Operator's testimony Instrument diagnostics Dry gas calibration check Quarterly Inspection
On an instrument receiving a valid periodic inspection	Introduction of the most recent Certificate of Inspection issued prior to the subject's test.

Step 7 - Submission to the Tests

When the driver agrees to the requested test, the Implied Consent Law requires the chemical test to be administered under the **direction** of the **Arresting Officer**. This **does not** mean that the arresting officer must personally administer the tests or even observe the entire process. The test(s) can be performed by a certified Intoxilyzer™ 9000 operator or by other qualified personnel in the case of blood and/or urine. The arresting officer **should** however be able to testify from first hand knowledge that the requirements for an admissible chemical test were fulfilled or the test result may not be admissible. The requirements for admissibility of a chemical test of a defendant's breath are that the test must be performed:

Pre-test deprivation / The 20 Minute Wait

In addition to the elements required for the legal admissibility of test results, individuals performing chemical tests should focus on techniques learned during their training to ensure that the best practices for breath alcohol testing are followed. Prior to the test being performed all initial breath tests should be preceded by a 20 minute deprivation or waiting period. During the 20 minute period immediately prior to the test the subject should be **deprived of alcohol** . Practical ways to assure the subject is deprived of alcohol during the 20 minute wait are:

- Do not allow the subject to eat, drink, smoke, or take medication during the 20 minute Wait.
- Reasonably ensure the mouth is free of any foreign object (gum, tobacco, food or drink)
- Monitor the subject for any overt signs of regurgitation, such as retching or vomiting.

Ensuring that the 20 minute waiting period has been properly met is the operator's responsibility. Administering the 20 minute wait **does not require** that:

- The operator administer the entire 20 minute wait. It may be administered by other officers as long as its administration is verified by the operator.
- The officer administering the 20 minute wait stare at the subject continuously for 20 minutes.
- The officer restart the 20 minute wait if burping or belching occurs as long as regurgitation is not suspected.

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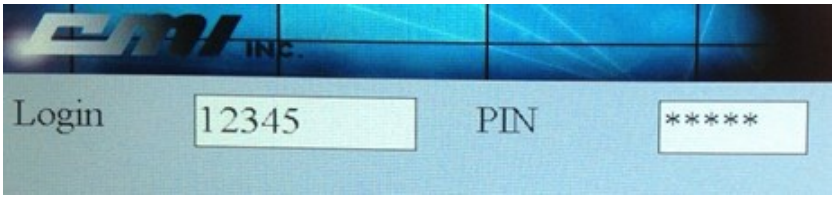
THE INTOXILYZER 9000 QUESTION SEQUENCE

Starting the Test and Login

In order to conduct an evidential breath test on an Intoxilyzer 9000, all operators will be required to login using a predefined login name and PIN. This login process is designed to ensure that each type of user has access to the menu functions appropriate to their responsibility. In order to initiate an evidential breath test the operator must push the green button in the bottom right hand corner of the instrument's touchscreen. The operator will then be prompted to login with their login number and pin:

1. All operators will be given the same login ID and PIN. (It is possible at some point in the future each operator's permit number will serve as his or her login ID.)
2. Each login ID is assigned a specific level of access based on the individual's level of responsibility.
3. Operators are permitted to run tests, run instrument diagnostics, and reprint tests.



Instrument Question Sequence

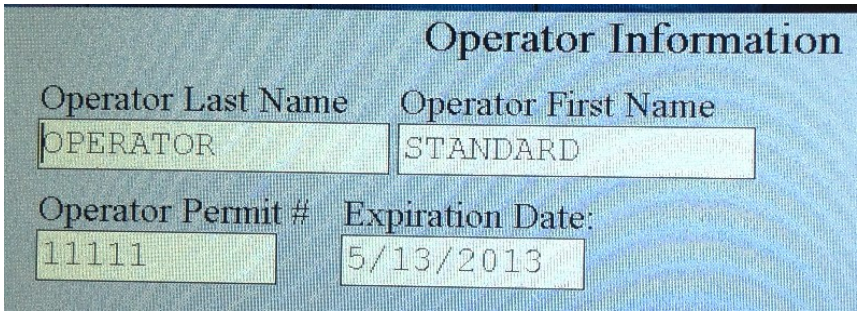
Prior to running a test, the Intoxilyzer™ 9000 requires that the operator provide specific information related to the test. During the instrument question sequence the operator will be asked to provide four types of information:

1. **Operator Information** (Includes Operator Name, Permit Number and Expiration Date).
2. **Arresting Officer Information** (Includes Name and Arresting Officer's Agency).
3. **Subject Information** (Includes Name, DOB, Gender, and Driver's License Number.)
4. **Incident Information** (Includes Violation Date and Time, Case Number, and Reason for Test.)

Operator Information

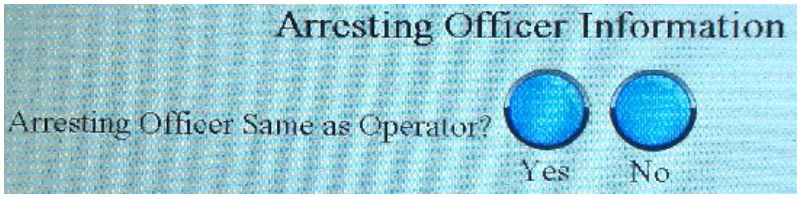
Operators will be prompted to provide the following information. This information should be reviewed carefully before selecting the advance screen arrow at the right of the instrument display.

1. Operator Last Name: type in last name and any suffix (i.e.: Jr., Sr., III, etc.)
2. Operator First Name: type in first name as it appears on the operator's permit (no rank, nickname, or other title)
3. Permit Number: type in permit number as it appears on the operator's permit.
4. Expiration Date: type in permit expiration date as it appears on the operator's permit.



Arresting Officer Information

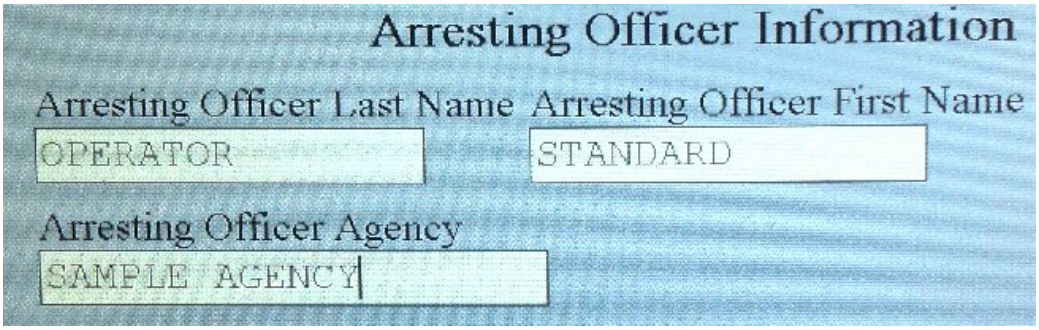
Once the operator has entered the required information and selected the screen advance arrow, he or she will be asked whether the arresting officer is the same as the operator. If yes is selected then the arresting officer last and first name fields will be automatically populated with the operator's name, if no is selected the information must be manually entered by the operator.



5. Arresting Officer Last Name: Type in last name and any suffix (i.e.: Jr., Sr., III, etc.)

6. Arresting Officer First Name: Type in first name (no nicknames, titles, etc.)

7. Arresting Officer Agency: Type in the arresting officer's agency as close to the following format as possible. **City or County name followed by PD or Co SO**. (e.g. Atlanta PD, Hall Co SO,GSP Post 10, DNR region 3). It is important the agency names are consistent within a given agency in the event that the arresting agency needs to be identified at a later time.



Subject Information

8. Subject Last Name: Type in last name and any suffix (i.e.: Jr., Sr., III, etc.)

9. Subject First Name: Type in first name (no nicknames, titles, etc.)

10. Subject M.I.: Type in the subject's middle initial if one is known. (no nicknames, titles, etc.)

11. Subject Date of Birth : Type in the subject's date of birth in the format MMDDYYYY. If the subject's DOB can not be determined then type in the current date.

12. Gender : Select the subject's gender. If the subject's gender can not be determined then select unknown.

13. Subject DL Number : Type in the subject's driver's license number. Be sure to enter the state abbreviation for out of state drivers' license. If the driver's license number is unknown at the time of the test, type UN-KNOWN.

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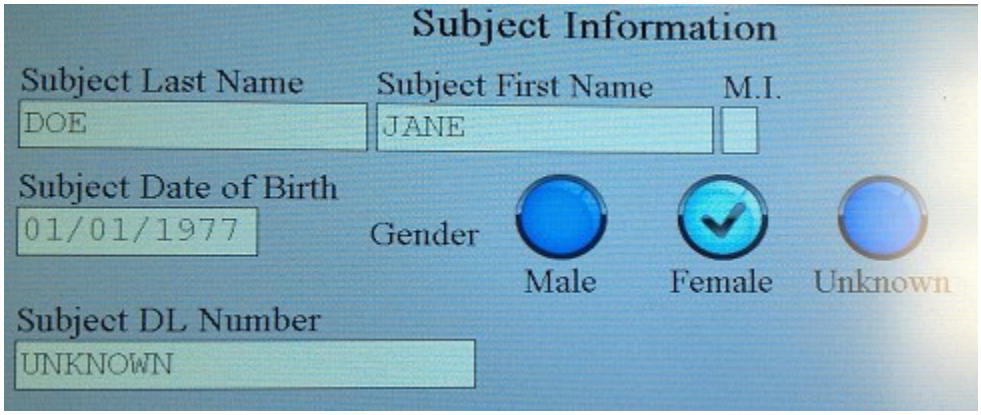


Incident Information

Once the operator has entered the required information and selected the screen advance arrow, he or she will be asked to enter Incident Information.

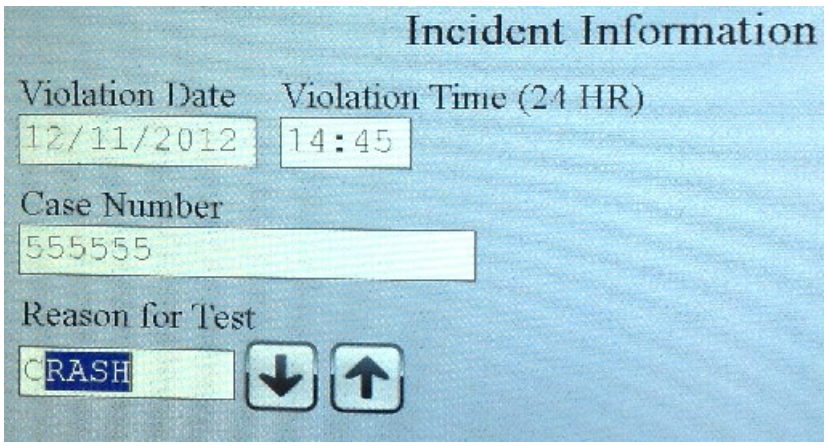
14. Violation Date: Type in the violation date in the format MMDDYYYY

15. Violation Time: Type the violation time in 24 hour format (e.g. 0300 or 2100)

16. Case Number: Type in an agency case number if desired. This field is optional.

17. Reason for Test : Select the reason for the test from the list box by using the arrows to the right of the box. The available options are as follows:

- DUI - Test is the result of a DUI arrest
- Crash – Test is the result of a DUI arrest where a crash is involved
- Fatality – Test is the result of a DUI arrest where a fatality is involved.
- BUI - Test is the result of a boating under the influence arrest
- Probation – Test is conducted as part of a probation revocation or evaluation.
- Training – Test is to be solely used as a training sample.
- DUI - Test is the result of a boating under the influence arrest
- Other – Test is being conducted for reasons other than those listed above.
- QC - Reserved for quality control tests performed at the direction of GBI-DOFS.



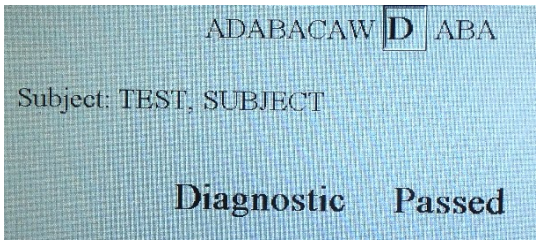
THE INTOXILYZER 9000 TEST SEQUENCE

The Intoxilyzer™ 9000 will perform a breath alcohol test after all of the pre-test questions are answered. Before starting the test sequence the instrument will ask the operator if they would like to review the information. This gives the operator the opportunity to check spelling and correct any errors prior to running the test. Once the test sequence is underway, the information supplied by the operator cannot be changed. The test sequence executed by the Georgia Model Intoxilyzer 9000 is ADABACAWDABA where each letter corresponds to a component of the test. Each component of this testing process is summarized below.

Diagnostics (D)

Prior to testing each set of samples, the instrument performs an electronic self diagnostic. This test is designed to test the performance of critical components of the instrument's optical bench including the detector and infrared light source. The diagnostic on the Intoxilyzer 9000:

- Checks the **Software** using an **analytical checksum**.
- Checks the **Analog to Digital Converter (ADC)** and the **Real Time Clock (RTC).**
- Checks the detector **voltage/current** to verify that it is within an acceptable **range** and shows **stability.**
- Performs an **Internal Test Protocol or ITP** that verifies the **analytical status of the instrument calibration** by adjusting the source output to a preset value and then comparing the detector response to values stored during instrument calibration**.**
- Checks the **temperature regulation** of the sample chamber.
- The Intoxilyzer 9000 also checks the **temperature regulation of the breath tube** and **internal instrument temperature.**



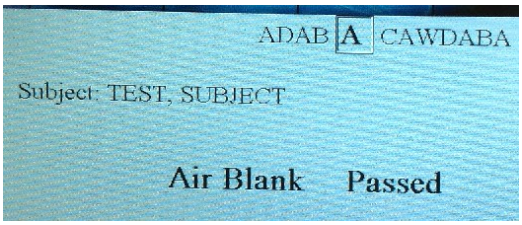

```
Test                g/210L    Time
Air Blank           0.000     09:31:45
Diagnostics         Passed    09:31:48
ITP Check           0.100     09:32:26

Extended Diag Info
--------------------
Analytical Checksum Passed
Voltage/Current     Passed
Memory              Passed
Real Time Clock     Passed
Temp Regulation     Passed
ADC                 Passed
Anayltical Status   Passed
```

The instrument screen will display "Diagnostic Passed" if all of the required criteria are met.

Air Blank (A)

Unlike the diagnostics which are designed to be an electronic check of various components of the optical bench, the air blank routine tests the conditions of the instrument's breath sample pathway and pumps. During the Air Blank, the instrument is purging the sample chamber by pulling air through the breath sample pathway from the breath tube to the sample chamber. **Thus to ensure proper flow, it is important that the mouthpiece is removed before the Air Blank begins.** While performing the Air Blank, the instrument detector is taking continuous measurements to ensure that the instrument is purged of alcohol and the detector reading returns to an acceptable zero reference level. Provided the ambient air is free of alcohol and that a stable signal is attained, "Air Blank Passed" will appear on the screen. If the instrument can not purge the sample chamber and produce an acceptable alcohol free result, the instrument will return an **"Ambient Fail" or "Purge Fail"** warning and abort the test. After an acceptable Air Blank, the instruments sets a zero reference measurement for the test using the ambient air in the sample chamber.

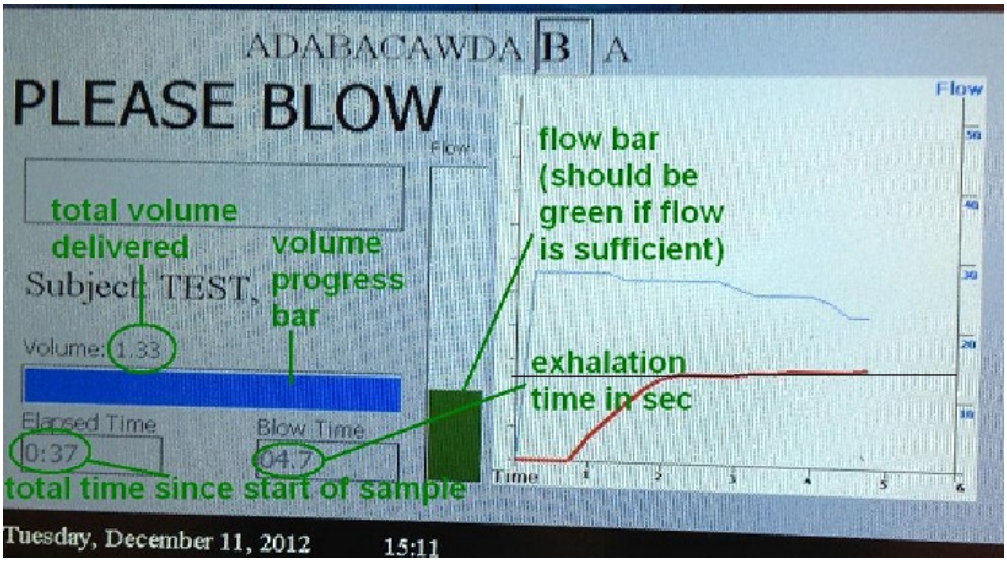


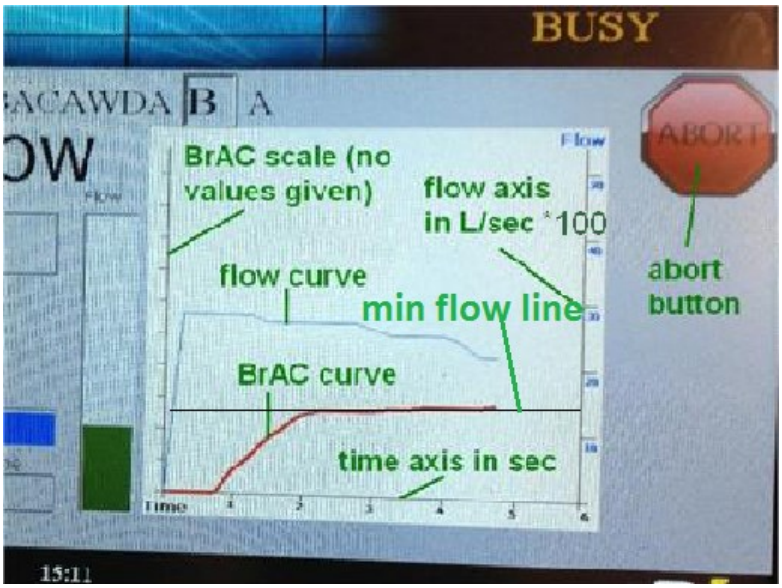
Breath Test/ Breath Sample (B)

Once the Air Blank is complete the instrument will proceed to request a breath sample from the subject by displaying "Please Blow" on the screen. When this occurs, the operator should insert a new mouthpiece securely into the breath tube. A new mouth piece should be used for each subject sample. Instruct the subject to take a deep breath and blow into the mouthpiece keeping the tone sounding as long as possible. **Have the subject blow until they are physically unable to provide any more air** or until the instrument indicates that it has completed receiving the sample**.** The subject has **three minutes** to provide an adequate breath sample that meets the requirements for flow, volume, and level slope. If the subject stops blowing before providing an adequate breath sample, "PLEASE BLOW" will continue to be displayed. In addition, a beep will sound every few seconds until the subject begins blowing or until three minutes have elapsed from the time the instrument initially requested the subject to blow into the mouthpiece. If the subject does not provide an adequate breath sample in three minutes, the instrument will print "INSUFFICIENT SAMPLE".

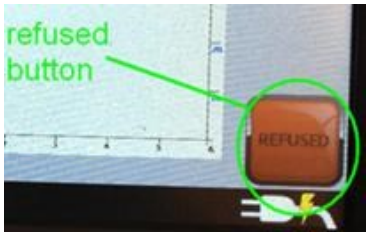
During the breath test the instrument's display will show several indicators of the subject's progress in providing an adequate breath sample. The Intoxilyzer 9000 will display a real time graph of the subject's breath flow and BrAC in addition to displaying the blow time, blow volume, and the time elapsed since the test began.

- **Volume**: This indicates the total volume delivered in the current exhalation. The Intoxilyzer 9000 requires a minimum of approximately 1.1 L of breath be delivered in a single exhalation.
- **Volume Progress Bar**: Shows a graphical representation of the total volume delivered during the exhalation.
- **Flow Bar**: Shows a graphical representation of the subject's breath flow rate during the exhalation. The subject should blow hard enough so that the bar maintains a green color. The minimum acceptable flow rate for the Intoxilyzer 9000 is approximately 0.15 L/sec.
- **Flow Curve**: Shows a graphical representation of the subject's breath flow rate during the exhalation. The units of the graph axis are L/sec *100. The instrument will cease accepting the sample when the flow drops below 0.15 L/sec or a displayed reading of 15.
- **Blow Time**: Shows the time elapsed since the current exhalation began. Blow times of more than 1 second are required for sample acceptance.
- **Elapsed Time**: Shows the total time elapsed since the breath sample was requested by the instrument. An insufficient sample will be registered if an sufficient sample has not been provided within 3 minutes.
- **BrAC Curve:** Shows a graphical representation of the subject's BrAC during the exhalation. A subject's BrAC curve should typically show a steady rise followed by a gradual leveling off. The Intoxilyzer 9000 requires the subject to blow until the BrAC curve exhibits an acceptably level slope. No indication of the quantity of alcohol in the subject's breath will be given on the graph.





Should the subject verbally refuse to provide a sample after the test has been set up, the operator can select the **REFUSED** button at the lower right hand corner of the instrument display. Once the subject begins blowing this option will disappear.



If the subject never causes the tone to sound, the subject is not blowing hard enough and the failure to provide a sufficient sample could be considered a non-verbal refusal. The **arresting officer** must be able to articulate how the subject refused to take the test. Once the subject sample is complete the Intoxilyzer 9000 will display the breath sample result on the screen.

Calibration Check (C)

The Intoxilyzer 9000 is configured to run a calibration check using an ethanol gas standard after the first subject sample. The measured value must be **within +/- 5% or +/- 0.005 g/210L** of the target reference value or the instrument will abort the test. Typically a gas ethanol standard with a target value of 0.080 will be utilized, in which case the cal check reading must be between 0.075 and 0.085 g/210L. Because the actual amount of ethanol in the fixed volume of gas delivered from the compressed ethanol gas standard varies slightly based on the atmospheric pressure, the Intoxilyzer 9000 is equipped with a barometric pressure sensor that automatically adjusts the reported cal check value based on the measured atmospheric pressure at the time of the test. At normal temperatures the barometric pressures found throughout the state of Georgia would not be expected to cause the ethanol gas standard concentration to vary by more than +/-5% of the target value stated on the gas cylinder. It should be noted that even though atmospheric pressure can have a small effect on the concentration of ethanol obtained from a gas standard during a dry gas calibration check, atmospheric pressure has no significant effect on a subject's breath alcohol concentration.

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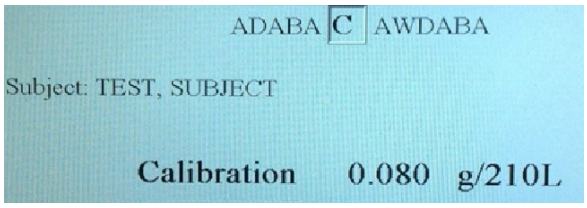


Wait (W)

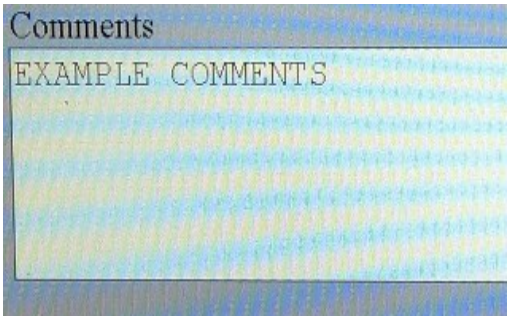
The instrument will wait so that the time between subject samples will be approximately 5 minutes. This intermission between breath samples is to provide the subject with sufficient time to recover from giving the first sample and allow the deep lung air to equilibrate. In addition, the wait time between replicate samples is an important component of the instrument's safeguards against residual or mouth alcohol. Though it is very unlikely that a subject is affected by residual or mouth alcohol at the time of a breath test, in the event that an undetected exposure to alcohol does occur within 10 to 15 minutes of the test, the use of replicate samples effectively eliminates the possibility of residual or mouth alcohol having a significant effect on the breath alcohol result. The operator should use the 5 minute wait between samples to continue to observe the subject for any overt signs of regurgitation.

When the wait is complete the instrument will repeat the sequence of Diagnostic, Air Blank, Breath Test, Air Blank. **A complete breath test generally consists of two breath samples;** however if after providing a sample that produces a printed alcohol concentration analysis, the subject refuses to provide a second sample then the first sample is legally admissible as evidence of his or her alcohol concentration. Though the subject is not legally required to provide two breath samples, obtaining two subject samples is greatly preferred because it allows the operator to demonstrate:

- That the breath alcohol concentration obtained from the subject was reproducible and subsequently charge the subject with the lower of the two results.
- That residual or mouth alcohol did not have any significant effect on the breath alcohol readings.
- That there wasn't some single unexpected event such as RFI that affected the breath alcohol readings.

Once the test is completed the instrument will ask the operator for any additional comments. Though this field will usually be left blank, it gives the operator an opportunity to add any additional comments about the subject's performance during the breath test or the testing conditions. These comments should be primarily used to:

- Explain any unexpected results (i.e. Operator inadvertently hit radio transmit button during the test causing RFI warning)
- Describe any non-compliant behaviors (i.e. the test subject would not make complete seal with mouth around the mouth piece, no tone or breath volume measurement was displayed by the instrument)
- Document any unusual conditions that were present or arose during the test. **For all testing done in mobile testing environments, the additional comments should be used to document the temperature of the testing environment.** (i.e. temperature at the time of the test was 72F)



After adding any necessary comments, the operator will be asked how many copies of the breath test report are desired. **The operator should sign the breath test report on the line provided for the operator's name and give the test subject a copy of the completed report. In addition the operator should place a copy of the breath test report in the GBI test logbook.**

Georgia Model Intoxilyzer 9000 TestID# 0502130001 Date 05/01/2013

Instrument Info

Inst Serial # 90-000502 Software Version 9406.01.01 Agency GBI
Target Value 0.080 Lot # 03713080A2 DOFS

Subject Info

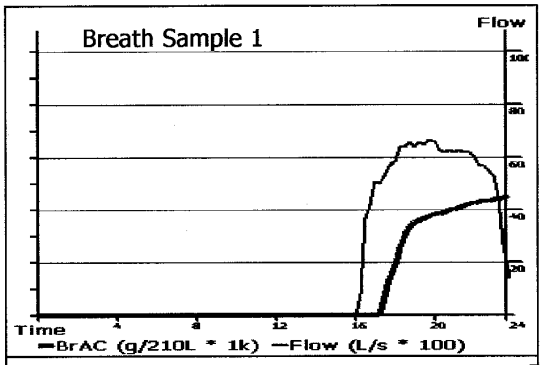
Subject Name DRINKING, SUBJECT 4 Measured BrAC (g/201L) 0.055 (+/- 0.005)
DOB 05/01/2013 DL NONE Gender Male Reason for Test: OTHER
Additional Comments SUBJECT 4

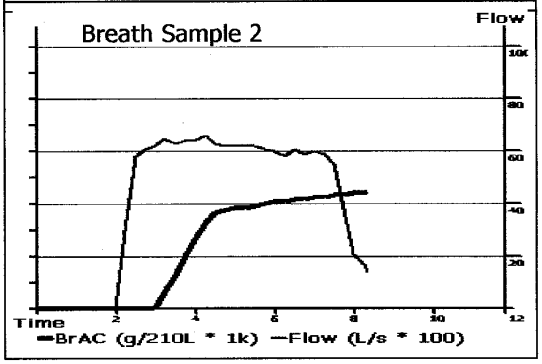
Operator Info

Operator Name SUPERVISOR, AREA Permit # 33333 Expiration Date 05/13/2013
Arresting Officer SUPERVISOR, AREA
Arresting Agency GSP Case # 2013-02

Result Details

Test	g/210L	Time
Air Blank	0.000	13:57:00
Diagnostics	Passed	13:57:04
Air Blank	0.000	13:57:41
Subject Sample	0.056	13:58:16
Breath Volume	4.23 Liters	
Air Blank	0.000	13:58:58
Dry Cal Chk	0.077	13:59:21
Air Blank	0.000	14:00:00
Diagnostics	Passed	14:02:07
Air Blank	0.000	14:02:44
Subject Sample	0.055	14:03:03
Breath Volume	3.48 Liters	
Air Blank	0.000	14:03:46





Operator's Signature

Date of Last Calibration adjustment: 03/19/2013
Date of Last Inspection: 03/25/2013
CMI Calibration Laboratory is a ISO 17025 accredited calibration laboratory for breath alcohol measuring instruments.

Printed On: 05/01/2013 14:04

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THE INTOXILYZER 9000 BREATH TEST REPORT

The Intoxilyzer 9000 prints the breath test result on a full 8.5" by 11" sheet of copy paper using a Windows CE compatible printer. The Intoxilyzer 9000 breath test report contains information divided into several major sections. A summary of the information printed on the breath test report is as follows:

Header Information

Georgia Model Intoxilyzer 9000 TestID# 0502130001 Date 05/01/2013

Georgia Model Intoxilyzer 9000 shows that the instrument was configured for use in Georgia.

Test ID# is a unique record number for each test, if evaluation of electronically retained data is needed the test can be identified by the Test ID.

Date shows the date the test was performed.

Instrument Info

Instrument Info

Inst Serial # 90-000502 Software Version 9406.01.01 Agency GBI
Target Value 0.080 Lot # 03713080A2 DOFS

Instrument Serial Number shows the unique identification number for the instrument.

Software Version shows the software version number installed on the instrument at the time the test was run.

Agency shows the agency to which the instrument is registered, this should also reflect whether the instrument is listed as a mobile instrument. (E.g. Atlanta PD mobile unit)

Target Value shows the target value of the dry gas standard in g/210L. Thus a 0.080 g/210L target value would be displayed as 0.080.

Lot # shows the lot number for the current dry gas standard.

Subject Info and Operator Info

Subject Info

Subject Name DRINKING, SUBJECT 4 Measured BrAC (g/201L) 0.055 (+/- 0.005)
DOB 05/01/2013 DL NONE Gender Male Reason for Test: OTHER
Additional Comments SUBJECT 4

Operator Info

Operator Name SUPERVISOR, AREA Permit # 33333 Expiration Date 05/13/2013
Arresting Officer SUPERVISOR, AREA
Arresting Agency GSP Case # 2013-02

Most of the fields contained within the Subject Info and Operator Info sections of the report with the exception of Measured BrAC have already been addressed in this manual. Measured BrAC will be addressed in the following section titled Evaluation of Sample Results.

Evaluation of the Sample Results

In addition to the instrument, subject, and operator information, the Intoxilyzer 9000 provides numerous pieces of information regarding the subject's test. It is important for the Intoxilyzer 9000 operator to understand the meaning and significance of each of these pieces of information.

Measured BrAC (g/210L)

Measured BrAC (g/201L) 0.055 (+/- 0.005)

The Measured BrAC field on the report contains two important pieces of information. The first is the breath alcohol concentration in g/210L with which the subject is to be charged. O.C.G.A. 40-6-392 states that two sequential breath samples will be requested from a subject for testing and in order for those results to be admissible they shall not differ from each other by more than 0.020. In addition. it states that the lower of the two results shall be determinative for accusation and indictment purposes. Thus where two consecutive subject sample results exist, the Measured BrAC shows the lower of the two results. The operator should also note that for the purposes of charging suspects with DUI, O.C.G.A. 40-1-1 defines **alcohol concentration** as grams of alcohol per 100 milliliters of blood or **grams of alcohol per 210 liters of breath**. The second important piece of information found listed in the Measured BrAC field is the **measurement uncertainty** for the test result. It is calculated as **+/-5% of the Measured BrAC or +/-0.005 whichever is greater**.

The existence of **measurement uncertainty** does not mean that the operator can not be certain of the subject's breath alcohol concentration. Measurement uncertainty is a statistical quality control tool that allows the Division of Forensic Science to determine with a specific degree of confidence how close the subject's true breath alcohol concentration is to the measured value reported by the instrument. Operators must remember that any analytical measurement process, no matter how well designed, will exhibit small random fluctuations in the result it produces. For example a doctor who measures a fevered child's temperature with an oral thermometer and obtains a reading of 103.5 degrees Fahrenheit may measure the same child two minutes later and obtain a reading of 103.3. In fact, the doctor may take 100 readings over a 5 minute period and find that the average temperature reading is in fact 103.4 degrees but that 99% of all the readings fluctuate between 103.0 and 103.8. This fluctuation in the measured temperature illustrates the measurement uncertainty of the analytical method. The measurement uncertainty in this example may be due to instrumental factors such as limitations in the thermometer itself or sampling factors such as how and where the thermometer was placed in the child's mouth. Though the Intoxilyzer 9000 and the testing process are designed to minimize the measurement uncertainty in the analytical result, it can not completely eliminated. **Based on statistical evaluation of subject tests and control results, breath testing instruments used in the state of Georgia exhibit a measurement uncertainty of about +/- 5%**.

Though the measurement uncertainty exhibited by a particular analytical method can have multiple contributors, sources of measurement uncertainty fall into one of two categories: **systematic error** or **bias** and **random error**. As illustrated earlier, **random error** arises from random fluctuations in the sample readings that are normally distributed around some mean value. These random fluctuations are statistically described by the **precision** of the measurement.

Precision— Precision is a measure of how close together a group of measurements are to each other independent of their accuracy. Typically precision is reported using statistical terms such as standard deviation of the mean or coefficient of variation (%CV). With regard to **precision**, breath alcohol testing has a recognized variability of about 7% for single breath samples and 5% for the mean of duplicate samples at the 95% confidence interval .* This means that if you take any one sample, 95% of the time it will be within 7% of the true mean of an infinite number of measurements. When you are able to obtain two samples, statistically the average of those two results will be within 5% of the true mean at the 95% confidence interval. Using this variability, replicate breath samples may differ by as much as 7% from their mean.

Precision

(* based on the internal evaluations done at the GBI-DOFS Implied Consent Section. Internal research and some current literature cites approx. 6.5% measurement uncertainty for the average of two samples at the 99% confidence interval and 5% at the 95% confidence interval)

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While this 5% variability in subject breath alcohol results has several sources, the largest contributor to measurement uncertainty in a subject's breath test result is small random fluctuations in the composition of the breath sample delivered to the instrument known as **natural sampling variability**. In a complete test, the measured BrAC is the product of the analysis of two separate breath samples. Each breath sample will have a *slightly* different chemical composition due to its interactions with the subject's alveolar blood supply and respiratory tract. Even though the Intoxilyzer 9000's slope detector requires a certain degree of alcohol equilibrium between the subject's alveolar blood supply, respiratory tract, and breath, consecutive breath samples will typically show some small variability in alcohol concentration. This is a limitation imposed by human physiology, but its effect on the variability of sample results can be minimized by encouraging subjects to give reproducible maximum exhalations. Any breath sample that is composed of less than 100 % "deep lung" alveolar air or that has not reached chemical and thermal equilibrium with the pulmonary alveoli will have a lower alcohol concentration than the subject's actual alveolar alcohol concentration. Thus **natural sampling variability** is the primary reason for small differences in alcohol concentrations observed between consecutive breath samples.

Systematic error or **bias** occurs when the mean result produced by an analytical method is either consistently high or consistently low. Through extensive evaluation of known control samples the breath testing methods used in Georgia have been shown to exhibit no significant systematic error or bias. The term usually used to describe systematic error is accuracy.

Accuracy— Accuracy is a measurement of how close the measured results lies to the actual value. During quarterly inspections instruments are required to produce results within +/-5% or +/-0.005 g/210L, whichever is greater, of the target value of a certified ethanol reference solution. While repeat analysis may show some fluctuation in control results, measured results within +/- 5% of the target value indicate that there is no significant systematic bias in the instrument's performance. In addition to wet bath control tests performed during the instrument inspection, the dry gas calibration check performed at the time of the breath test also verifies the instrument is performing as expected with respect to accuracy and precision.

Accuracy

The 0.02 allowable difference—Operators should be careful not to confuse the 0.02 allowable difference required by OCGA 40-6-392 with the instrument's accuracy and precision which is within approximately 5% of the average breath test value. In order for breath sample results to be legally acceptable in the State of Georgia they must not vary by more than **0.020 grams**. The vast majority of the time the difference between samples should be significantly less than 0.02. Lower alcohol concentrations will usually exhibit a smaller absolute variability than higher ones. **To check any particular test to ensure that it is within the 0.02 allowable difference, take the larger value and subtract the smaller result, if the difference is 0.020 grams or less the test is acceptable**. If the test result is unacceptable, wait twenty minutes and repeat the test. Note that the operator is statutorily prohibited from obtaining more than two breath tests where an adequate sample has been provided. Thus if two consecutive breath tests from the same subject both differ by more than 0.020, the operator must request a blood test if a chemical test is to be performed. In this situation a third breath test can not be requested. By ensuring 0.020 agreement between consecutive samples, the operator can effectively eliminate the possibility that residual or mouth alcohol had any effect on the measured BrAC.

Result Details

The result details section of the breath test report shows the result of each test element and when the test was performed. Normal details listed on an Intoxilyzer 9000 Breath Test Report include the result and time of the following elements:

Result Details

Test	g/210L	Time
Air Blank	0.000	13:57:00
Diagnostics	Passed	13:57:04
Air Blank	0.000	13:57:41
Subject Sample	0.056	13:58:16
Breath Volume	4.23 Liters	
Air Blank	0.000	13:58:58
Dry Cal Chk	0.077	13:59:21
Air Blank	0.000	14:00:00
Diagnostics	Passed	14:02:07
Air Blank	0.000	14:02:44
Subject Sample	0.055	14:03:03
Breath Volume	3.48 Liters	
Air Blank	0.000	14:03:46

Air Blank: As discussed earlier, the air blank element of the breath test consists of purging the instrument's sample chamber with ambient air and verifying that the reading from the detector returns to an acceptable zero reference value. The displayed result for the air blank should be 0.000. In the event that a 0.000 reading can not be obtained during the air blank, an **Ambient Fail** warning will be printed on the report and no subject sample result will be printed. The most likely sources of an **Ambient Fail** is that the air around the instrument is contaminated with some volatile organic chemical or that the air flow during the air blank has become restricted by **failure to remove the mouth piece** or obstruction of the breath sample pathway. Should this occur, the operator should ventilate the area, check to see that the breath pathway is free of obstructions, and attempt another test. If the problem can not be corrected, the operator should contact the area supervisor responsible for the instrument inspection. If another testing instrument is not available, the operator or arresting officer will need to re-read the Implied Consent notice and request a blood test from the subject.

Diagnostics: The diagnostics element of the breath test is an electronic check of critical elements of the instrument's optical bench or ethanol measuring systems. The displayed result for the Diagnostics should read Passed. If the diagnostics does not pass all of the required criteria, the breath test report will indicate that the **diagnostic failed** and give a brief description of the reason for the failure. Reasons for diagnostic failure varies from a failure to sufficiently warm up the instrument before attempting a test to indications that significant repairs are required. In the event of a diagnostic failure, allow the instrument to stabilize and then attempt another diagnostic. **It may be prudent to turn off any radios, cell phones, or wireless recording devices prior to the diagnostic as detection of significant RFI during the diagnostic will result in a diagnostic failure warning.** If the problem persist contact your local area supervisor.

Dry Cal Chk: The Dry Cal Check element of the breath test is an external control check of the instrument's calibration performed at the time of the test using an ethanol gas standard attached to the back of the instrument. The displayed result for the dry cal check should be **within +/-5% or +/- 0.005 g/210**L, **whichever is greater**, of the target value listed at the top of the report. Typically the ethanol gas standard target value required by GBI-DOFS will be 0.080 g/210L The target ethanol concentration will be listed both on the gas bottle itself and the certificate of analysis provided by the vendor. **Agencies should retain certificates of analysis for all ethanol gas standards used in chemical testing.** All ethanol gas standards utilized during the breath test must be traceable to a recognized standard of reliability compliant with ISO 17025. **Thus an approved list of ethanol gas standards and vendors will be maintained by the Division of Forensic Sciences. Be sure to consult the gas standard Material Safety Data Sheet (MSDS) for safe handling and disposal instructions.**

Atmospheric Pressure: The concentration of ethanol delivered by the ethanol gas standard is to a small extent dependent on the atmospheric pressure at the time of the test. Thus the displayed Dry Cal Chk value is electronically adjusted to account for the current atmospheric pressure. In reality for the weather conditions and altitudes found in Georgia, atmospheric pressure has very little effect on dry gas standard ethanol concentration. Additionally atmospheric pressure has no effect on the instrument's ability to measure a subject's BrAC.

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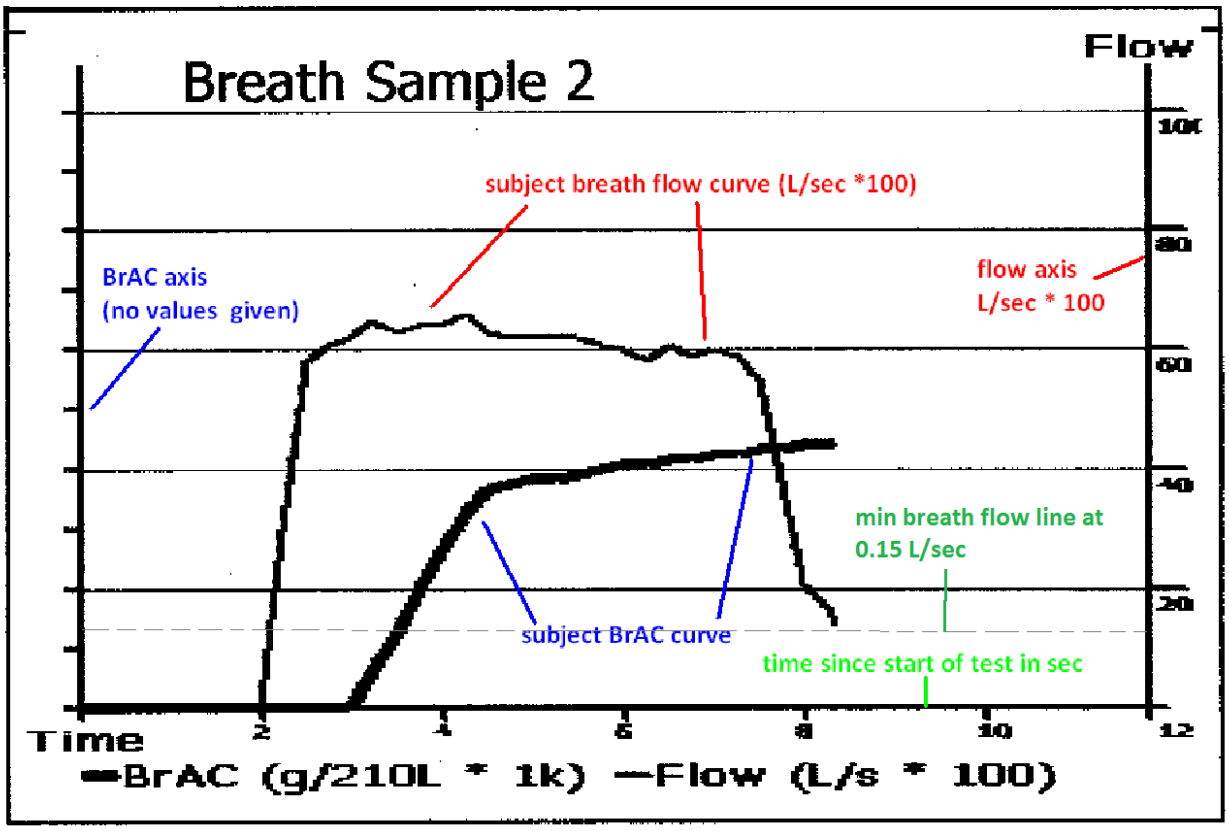
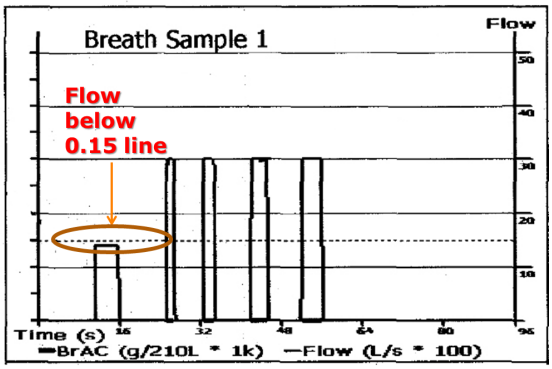
Result Details - Breath Sample Profile/ Breath Curves



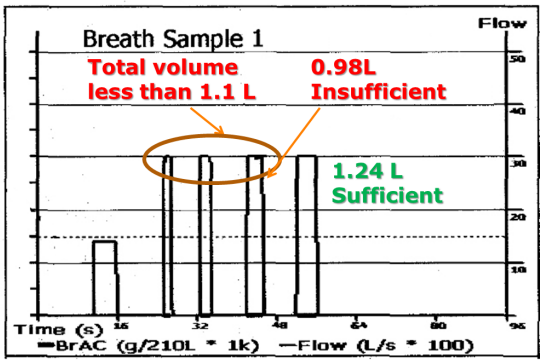
Each time the subject provides a sample that meets the minimum requirements for breath flow, the Georgia Model Intoxilyzer 9000 will produce a graphical representation of the subject's **breath sample profile**. Though the profile is not intended to be used to provide a numerical measure of the subject's breath alcohol concentration, it contains several pieces of useful information.

1. The breath sample profile provides a graphical representation of the subject's **breath flow rate** throughout the entire exhalation. The scale at the right of the profile shows the flow rate in L/s *100, so a numerical reading of 30 would be associated with a subject breath flow rate of 0.30 L/s. The Georgia Model Intoxilyzer 9000 will cease accepting a sample when the flow rate drops below 0.15 L/s or 15 on the flow axis.
2. The breath profile sample provides a graphical representation of the **breath alcohol concentration** throughout the entire exhalation. The scale units for the breath alcohol concentration on the left hand side of the graph are not given. The typical breath alcohol profile will show an initial rapid rise in the BrAC followed by a gradual leveling off. Breath samples that do not achieve a sufficiently level slope will not be accepted as sufficient samples. Breath samples that show a significant drop in the BrAC during the exhalation or a negative slope will be flagged as Invalid Samples. This being said, if a subject attempts more than one exhalation during a test or the breath flow temporarily drops below the minimum, the breath alcohol curve may appear broken or disconnected. The breath curve under this scenario may even appear to drop and rise again as the recorded BrAC graph connects the final BrAC value from the previous exhalation with the BrAC values from current attempt. This is normal under these conditions and is not an indication of mouth alcohol.
3. The breath sample profile shows the subject's **blow time** in seconds for the displayed exhalation on the bottom axis. Typically a minimum of 4 to 8 seconds of exhalation will be necessary to achieve a sufficiently level slope in the breath alcohol concentration profile.

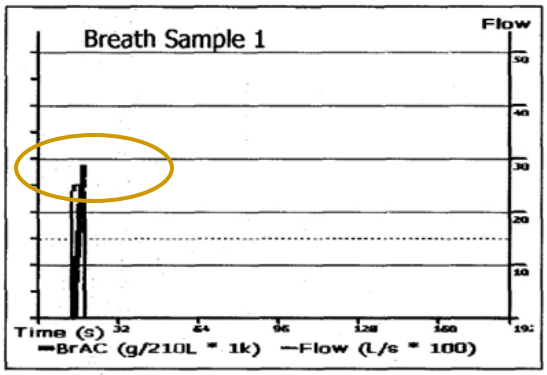
Example Breath Sample Profiles/ Sufficient and Insufficient Breath Curves



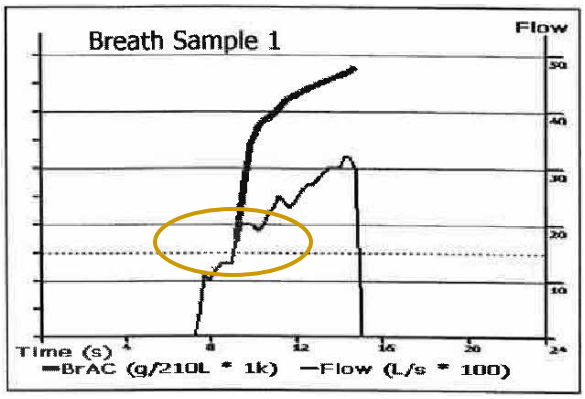
Insufficient Sample – Cause #1: A **breath flow** of **0.15 L/sec** or more had not been reached when the subject stopped blowing.



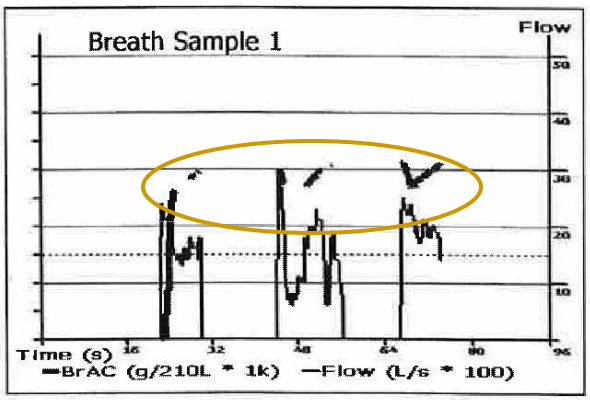
Insufficient Sample – Cause #2: A **breath volume** of **1.1 L** or more had not been reached when the subject stopped blowing.



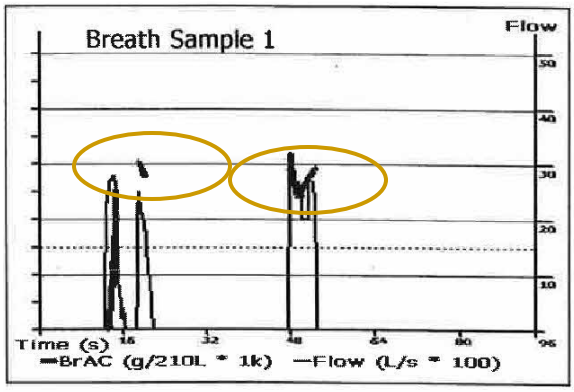
Insufficient Sample – Cause #3: A **level slope** in the BrAC curve had not been reached when the subject stopped blowing.



Sufficient Sample — Example 1: BrAC curve did not appear until the **breath flow** reached the minimum line.



Sufficient Sample – Example 2: Subect **breath flow** dropped below the minimum while blowing. Three separate exhalation attempts were made. Darker BrAC curve shows broken appearance as no BrAC is recorded when the flow is below the minimum.



Sufficient Sample – Example 3: Subject stopped blowing before the **minimum volume** was obtained. Darker BrAC curve shows apparent drop each time a new exhalation is attempted. This occurs as new breath of lower BrAC displaces air from the previous exhalation of higher BrAC.

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BREATH ALCOHOL LIMITATIONS

Through over fifty years of documented research and testing, breath alcohol testing has proven to be an accurate and reliable means of ascertaining a person's breath alcohol concentration, leading it to become the most widely used technique for measuring legal alcohol levels in the United States today. This being said, when evaluating any scientific testing method it is not only important to determine whether it is fit for the purpose for which it was intended, but it is also important to identify any limitations or conditions that might realistically have a significant affect on the method's expected degree of accuracy and reliability. While numerous different claims regarding the limitations of breath alcohol testing have been evaluated over the years, very few conditions have been actually found to have any significant effect on an evidential breath testing instrument's ability to accurately quantify alcohol in a subject's breath. The few conditions that have been found to potentially affect a breath test result have been specifically addressed through numerous checks and safeguards incorporated into both the Georgia Model Intoxilyzer 9000 and the breath testing method. Through these checks and safeguards, the Georgia Model Intoxilyzer 9000 is designed to alert the operator when conditions exist that could potentially impact the expected degree of accuracy and reliability of the breath test and prevent a numerical result from being reported. Operators should focus on the best practices learned during training to prevent these conditions from being present during a breath test and should understand the proper action to take should one of these conditions be identified.

Subject/ Sample Conditions

1. **Insufficient Sample** - According to O.C.G.A. 40-6-392, **a sufficient breath sample is one that produces a printed alcohol concentration analysis**. As previously discussed, in order to produce a printed alcohol concentration analysis the Intoxilyzer 9000 requires subjects to meet minimum requirements for breath flow rate, total volume, and level slope in a single exhalation. A level slope can usually be visually observed as the subject's breath alcohol concentration curve begins to gradually level off after the initial rapid rise typically seen early in the exhalation. An insufficient sample warning will be printed if the subject does not meet the requirements for a sufficient sample **within three minutes**. Scientifically a person's breath alcohol concentration is ultimately the product of a continual exchange of ethanol between the blood and the breath that occurs in the pulmonary alveoli; however, as breath moves throughout the respiratory tract a substantial amount of alcohol can be lost to the cooler airway surfaces. By establishing minimum requirements for flow rate, total volume, and level slope the instrument can ensure that a certain degree of thermal and chemical equilibrium is reached between the measured breath and the alveolar air. **This can also be facilitated by encouraging subjects to provide a maximum exhalation.** In reality any breath sample delivered to the instrument will have an alcohol concentration lower than that found within the air of the pulmonary alveoli. If an operator obtains a test result indicating an insufficient sample, they should re-instruct the subject and attempt a second test. In the event that a second insufficient test result is obtained, the operator should seek to ascertain whether the cause of the insufficient sample was an intentional act of non-compliance or the result of a medical or physical limitation. **Failure to provide a sufficient sample may be considered a non-verbal refusal provided that no medical or physical limitation to the subject providing a sufficient sample exists.**

Result Details

Test	g/210L	Time
Air Blank	0.000	15:28:18
Diagnostics	Passed	15:29:05
Air Blank	0.000	15:29:31
Subject Sample	0.000	15:29:58
Breath Volume	3.38 Liters	
Air Blank	0.000	15:30:27
Dry Cal Chk	0.079	15:30:48
Air Blank	0.000	15:31:18
Diagnostics	Passed	15:34:07
Air Blank	0.000	15:34:34
Subject Sample	*	15:37:45
Breath Volume	0.00 Liters	
Air Blank	0.000	15:38:15

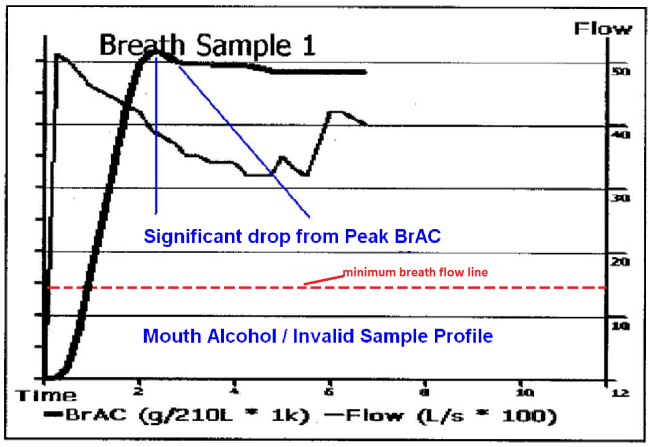
*Insufficient Sample

2. **Refusal** - According to O.C.G.A. 40-5-67.1 a subject may refuse to submit to a chemical test of their breath. Should the subject **verbally refuse** to provide a sample after the pre-test information has been entered, the operator may select the refusal option from the instrument menu. This option will disappear once the subject starts blowing into the instrument. If the subject does not verbally refuse, but fails to provide a sufficient sample within the three minutes allotted for the test, an Insufficient Sample result will be produced. Under some circumstances, this may be considered a refusal.

3. **Residual or Mouth Alcohol** - Residual or Mouth alcohol is a condition that occurs when the concentration of alcohol within the airspace of the oral cavity exceeds the alcohol concentration of the breath. This condition is short lived and can be effectively eliminated by employing several simple safeguards.

    1. **The 20 minute wait/ deprivation period.** As previously discussed, during the 20 minute period immediately prior to the breath test **the subject should be deprived of alcohol**. This applies to all initial breath tests and cases where exposure to residual or mouth alcohol is suspected. In order for the condition known as residual or mouth alcohol to be present, the subject must have oral exposure to some source of alcohol within 10 to 15 minutes of the test. This exposure can either be from some external source such as an alcohol containing beverage or an internal source such as alcohol containing material regurgitated from the stomach into the oral cavity. **Complete dissipation of mouth alcohol occurs within 10 to 15 minutes of exposure,** and thus if a subject is not exposed to some source of alcohol within 20 minutes of the test, then mouth alcohol will have no significant effect on the measured breath alcohol reading. This is the basis of the 20 minute deprivation period. During this deprivation or waiting period the subject should be in an environment where they can be prohibited from consuming any liquid that contains alcohol, and reasonably monitored for any overt signs of regurgitation such as retching or vomiting. If regurgitation into the oral cavity or vomiting is suspected during the deprivation period, make a note of it. When the subject has recovered sufficiently, allow them to rinse their mouth with water, and restart the twenty (20) minute waiting period. It should be noted that burping or belching prior to the test in the absence of regurgitation of alcohol from the stomach will have no affect on the breath test results. Additionally, a reasonable attempt should be made to ensure that the subject's mouth is free of foreign objects such as significant amounts of food, drink, tobacco, or gum during the twenty minute waiting period, even though it is highly unlikely they will affect the alcohol reading. The twenty (20) minute waiting period begins when the above conditions are satisfied. The Intoxilyzer operator is responsible for assuring the appropriate waiting/deprivation period is met.

    2. **The Slope/Mouth Alcohol Detector.** In the rare event that a subject is exposed to some source of alcohol within 20 minutes of the test and this exposure goes undetected by the operator, the instrument is designed to identify exhalation profiles associated with the residual /mouth alcohol condition. The breath alcohol profile typically associated with residual or mouth alcohol is characterized by an initial rapid rise in alcohol concentration as the subject starts to provide a sample followed by a distinct drop in the measured breath alcohol concentration as the subject continues to blow. Thus the Intoxilyzer 9000 is designed to flag any breath sample that exhibits a significant drop in the measured breath alcohol concentration during the subject's exhalation as an **Invalid Sample**. The proper function of the slope detector is verified during every quarterly inspection.



    3. **Replicate Samples.** The possibility residual or mouth alcohol affecting the Measured BrAC can be effectively eliminated by obtaining two consecutive samples from the same subject two or more minutes apart. Residual or mouth alcohol typically dissipates at a rate greater than or equal to about 50% every two minutes. This means that in the unlikely event that a subject is exposed to residual or mouth alcohol immediately prior to the test and that exposure goes undetected by both the operator and the instrument's slope detector, the five minutes between subject samples will give the residual or mouth alcohol time to dissipate by more than 75%. This dissipation will almost always cause the two consecutive sample readings to differ by more than the 0.020 g/210L allowable difference.

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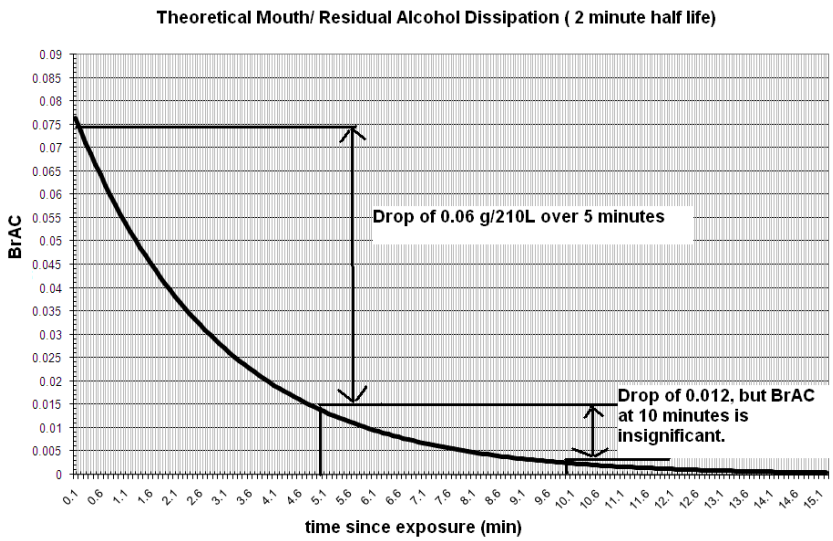
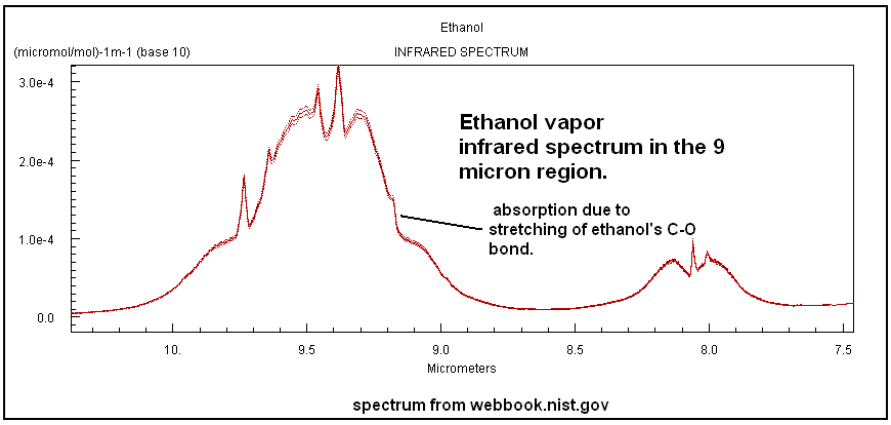
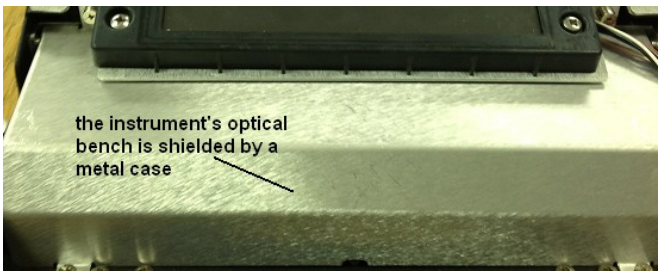


4. **Interferents** - The technique of structurally identifying compounds based on their pattern of absorption when exposed to various wavelengths of infrared radiation is a well recognized analytical technique known as infrared spectroscopy. It is made possible by the fact that the bonds within a given molecule will only absorb infrared energy at specific wavelengths and with specific relative intensities based on the unique composition of the molecule. The Intoxilyzer 9000 is designed to identify and quantify ethanol in breath by analyzing the amount of absorption that occurs at four specific wavelengths of infrared radiation that correspond to absorption by ethanol's carbon — oxygen and carbon — hydrogen bonds. Because very few compounds that could potentially be present in a human breath sample in significant amounts have carbon-oxygen single bonds, the Intoxilyzer 9000 is unaffected by most volatile organic compounds. In the rare event that a subject's breath does contain a significant amount of a volatile organic compound that absorbs infrared radiation at the wavelengths analyzed by the Intoxilyzer 9000, the instrument will compare the intensity of response from each of the four detectors to determine whether it matches the known pattern of absorption of ethanol. **Any breath sample that produces an analytical response different than that of ethanol will be flagged as an Interferent by the Intoxilyzer 9000**. In an evaluation of the specificity of the Intoxilyzer 9000 conducted by GBI-DOFS, the pattern of absorption of ethanol in the 9 micron region was found to be unique when compared to the published infrared responses for over 80 volatile compounds. Because the pattern of absorption for ethanol is unique at the four wavelengths analyzed by the Intoxilyzer 9000, the instrument exhibits a high degree of selectivity or specificity for ethanol. This means that the Intoxilyzer 9000 is able to distinguish ethanol from other volatile compounds and will not falsely identify them as ethanol.

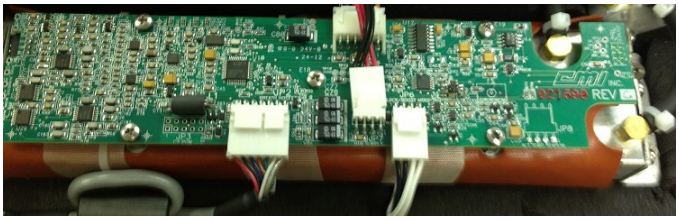


Environmental Conditions

1. **Radio Frequency Interference (RFI)** - It has been long understood that a sufficiently strong source of certain types of electromagnetic radiation could be used to induce a low level electrical current in metal objects such as wires or antennas. This in fact is the basis for wireless communication mediums such as radio, TV, and cellular phones. Unless amplified these electromagnetic signals in the ambient environment have little effect on most modern day electrical devices. This being said, most pieces of sensitive analytical equipment such as the Intoxilyzer 9000 are intentionally shielded from the effects of ambient electromagnetic radiation so they do not produce unwanted random fluctuations in electrical current known as electrical noise. The Intoxilyzer 9000's optical bench is completely encased in a metal box that effectively shields it from all ambient electromagnetic radiation and prevents radio frequency signals from devices such as police radios and cell phones from having any effect on electrical voltages produced by the detector. In addition, the Intoxilyzer 9000 is equipped with a Radio Frequency (RF) detection circuit designed to alert the instrument if any significantly strong source of radio frequency is in the vicinity of the instrument during the breath test. Any source of radio frequency sufficient to cause significant electrical disturbances in the RF detector will cause the Intoxilyzer to inhibit a breath test and print **RFI Detected** on the breath test report. Thus operators should avoid transmitting radio signals in the immediate vicinity of the instrument. Other sources of electromagnetic radiation such as cell phones, wireless recording devices or blue tooth devices are generally not strong enough to have any effect on the Intoxilyzer 9000; **however in some instances have been documented to produce RFI Detect warnings. Thus these devices should be turned off when in close proximity to the instrument if possible.** Should an operator obtain an RFI Inhibit warning, they should locate the source and eliminate it.



Intoxilyzer 9000 optical



2. **Ambient Air** - The Intoxilyzer 9000 uses air from the environment around the instrument to purge the breath sample pathway and sample chamber during its air blank routine. During the air blank the instrument continually takes alcohol readings from the detector to ensure that the sample chamber is purged until it is effectively alcohol free. The instrument will then take a final reading from the detector after the air blank is complete to establish a zero reference measurement for the breath test. If volatile contaminates from the air around the instrument prevent it from achieving an acceptable zero reference reading, the instrument will produce an **Ambient Fail or Purge Fail** warning. For this reason it is best to operate the instrument in an environment free of excessive fumes from chemicals such as cleaning supplies. Be aware that in some instances alcohol related odors from a drinking subject may cause low level environmental alcohol, and if the subject is in close proximity to the breath hose may cause a failure of the Air Blank or an **Out of Tolerance warning** on the dry gas calibration check. **Failure to promptly remove the mouthpiece after a breath sample may also result in these warnings.** Should an operator see an Ambient Fail Warning they should attempt to ventilate the area around the instrument, visually verify that the breath pathway is not obstructed and attempt another test. If the Intoxilyzer 9000 is able to successfully complete its air blank routine, then the ambient air around the instrument will have no significant effect on the subject's breath test result.

3. **Ambient Temperature** - Though the sample chamber temperature and internal temperature of the instrument are continuously monitored and regulated, it is important to only operate the Intoxilyzer 9000 within the recommended operating temperature range. The manufacturer's recommended operating range is from 0 degrees Celsius to 40 degrees Celsius or 32 to 104 degrees Fahrenheit; however, in order to avoid condensation, it is important that the temperature of any ethanol gas standard used with the Intoxilyzer 9000 not drop below about 50 degrees Fahrenheit. Thus to minimize any temperature related issues, it is recommended that the ambient temperature of the testing environment remain between **approximately 60° F and 93° F** .

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Instrument Condition

As stated earlier, all instruments should be operated with all of their parts attached and in good working order as prescribed by the manufacturer. The Intoxilyzer 9000 has very few external parts that can be detached; however there are numerous checks that verify the instrument's proper operation.

Element	Procedure	Performed by	Frequency	Document
Instrument Calibration (accuracy and precision)	• ISO 17025 calibration (checks calibration at multiple levels) • Quarterly Inspection (checks accuracy and precision at one level) • Ethanol Gas Standard (checks accuracy at 0.08 g/210L) • Instrument Diagnostics ITP (checks accuracy at a set level)	• CMI • Area Supervisor • Instrument • Instrument	• Initial purchase and as needed • Once per calendar quarter • After the first subject sample • Before each subject sample	• Calibration Certificate • Certificate of Inspection • Breath Test Report • Breath Test Report
Interferent Detection (selectivity or specificity for ethanol)	• CMI calibration procedure (checks acetone response) • Quarterly Inspection (checks ethanol/ methanol response)	• CMI • Area Supervisor	• Initial purchase and as needed • Once per calendar quarter	• Calibration Certificate • Certificate of Inspection
Slope/ Mouth Alcohol Detection	• Quarterly Inspection (checks mouth alcohol response)	• Area Supervisor	• Once per calendar quarter	• Certificate of Inspection
RFI Detection	• CMI calibration procedure (sets RFI sensitivity) • Quarterly Inspection (checks RFI response)	• CMI • Area Supervisor	• Initial purchase and as needed • Once per calendar quarter	• Calibration Certificate • Certificate of Inspection
Sample Pressure/ Flow Calibration	• CMI calibration procedure (calibrates flow sensor at 3 levels) • Quarterly Inspection (checks sample acceptance)	• CMI • Area Supervisor	• Initial purchase and as needed • Once per calendar quarter	• Calibration Certificate • Certificate of Inspection
Temperature Regulation	• CMI calibration procedure (verifies temperatures) • Quarterly Inspection (checks environmental conditions) • Instrument Diagnostics (checks hose, internal, and sample chamber temp)	• CMI • Area Supervisor • Instrument	• Initial purchase and as needed • Once per calendar quarter • Before every sample	• Calibration Certificate • Certificate of Inspection • Breath Test Report

Summary of Limitation Safeguards

Issue	Description	Operator Safeguard	Instrument Safeguard
Residual or Mouth Alcohol	Occurs when alcohol concentrations in the mouth from recent exposure to ethanol exceed the alcohol concentration in the breath.	• Ensure the 20 minute wait is observed and the subject is deprived of alcohol for 20 min prior to the test. • It is best practice to ensure the mouth is free of foreign objects such as gum, cigarette smoke, and significant amounts of tobacco or food. • Look for any overt signs of regurgitation such a retching or vomiting.	• Monitors the slope of the BrAC profile during exhalation and prints **Invalid Sample** warning if slope requirement is not met. • Evaluates the agreement between replicate samples and gives **0.02 agreement warning** if not met. • If the BrAC value exceeds the instrument's analytical range it will print a **Range Exceeded** warning.
Insufficient Sample	Occurs when the subject does not provide a breath sample that meets the requirements for flow, volume, and level slope.	• Properly instruct the subject to take a deep breath and blow until told to stop. • Facilitate a maximum exhalation keeping the flow above the minimum as long as possible. • Assess medical or physical limitations to adequate breath samples.	• Ensures that the subject blows with a certain force and a certain total time or total volume. • Requires the subject to continue to blow until the BrAC is no longer significantly rising. • Prints **Insufficient Sample** if criteria are not met.
Instrument Working Properly	Operators must lay foundation that the instrument is in good working order as prescribed by the manufacturer.	• Observe instrument for proper operation. Verify question sequence, display messages, and test routine are normal. • Be aware of any environmental conditions that would prohibit optimal test conditions.	• Performs self diagnostic before every sample and prints **Diagnostic Fail** if criteria is not met. • Performs an ethanol dry gas check with every test and prints **Out of Tolerance** if criteria is not met. • Periodic inspection performed every calendar quarter.
Carryover/ Ambient Alcohol	Occurs when the sample chamber can not be sufficiently purged of air containing alcohol or various other volatile chemicals.	• Make sure that the area around the instrument is well ventilated and free of any potential source of volatile chemicals or alcohol such as cleaners or spilled alcoholic beverages. • Be sure to remove the mouthpiece after every sample.	• Performs air blanks before and after every sample which purge the instrument with ambient air. Failure to purge sample chamber will result in an **Ambient Fail or Purge Fail** warning. • Low levels of ambient alcohol remaining after purge may cause an **Out of Tolerance** warning.
Radio Frequency Interference (RFI)	Occurs when a sufficiently strong source of radio frequency is detected by the instrument's RF detector.	• Refrain from using any radios in the immediate vicinity of the instrument during testing. • Turn off all cell phones and wireless devices when conducting a breath test if possible.	• Electromagnetically shielded against RFI. • Contains RFI antenna and detection circuit which will inhibit the test in the presence of significant RFI and produce **RFI Detected** warning.
Interferents / Volatile Chemicals	Occurs when there is a significant quantity of a volatile organic chemical in the subject's breath that is producing a response at the instrument's detector.	• Assess the subject and if volatile abuse is suspected request a blood test.	• Compares responses at four IR filters to differentiate ethanol from other compounds. Gives **Interferent Detected warning** if other compounds are detected.

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Summary of Common Instrument Display Messages

Message	Description	Common Causes	Recommended Actions
Invalid Sample	The instrument has detected a drop in the BrAC during the exhalation profile	• Residual or Mouth Alcohol	• Initiate a new 20 minute deprivation period and then retest the subject. • Request a blood test if necessary.
Insufficient Sample	The subject did not provide a breath sample that meets the requirements for flow, volume, and level slope.	• Medical or physical limitation in providing a sufficient sample • Intentional non-compliance with the operator's instructions.	• Re-instruct the subject and request a second test. • Inquire of the subject if they possess any medical conditions that would prevent them from providing a good sample. • Assess the stature of the subject.
Diagnostic Fail	One of the instrument's internal checks is out of tolerance.	• The instrument did not sufficiently warm up before running the self diagnostic • RFI detected during diagnostic. • Depending on the nature and frequency, maintenance may be needed	• Allow the instrument to warm up for an additional 10 to 20 minutes. • If the problem occurs again after the additional warm up time and the cause can't be identified, put an out of service sign on the instrument and contact your local area supervisor.
Out of Tolerance	The measurement from the ethanol gas standard is not within 5% or 0.005 g/210L of the target value. (Note: Failure of the ITP part of the diagnostic will produce a similar warning on some software revisions)	• Low tank pressure • Improper tank installation/ Leak in gas pathway • Dry gas pathway obstructed • Improper ventilation during air blank / mouth piece not removed after subject sample. • Low level ambient alcohol • Instrument is in need of calibration. • ITP failure during diagnostic.	• Verify environmental conditions. • If necessary, check tank pressure and installation or change tank. Force the instrument to initiate another dry gas check and if it passes attempt another test. • If a second consecutive warning is obtained, change tanks. If the same warning is then obtained from a different tank put an out of service sign on the instrument and contact your local area supervisor for instructions. • If the warning is associated with an ITP failure, see diagnostic fail.
Ambient Fail / Purge Fail	The sample chamber can not be sufficiently purged of air containing alcohol or various other volatile chemicals.	• The area around the instrument contains some source of alcohol or volatile chemicals such as cleaners. • The breath sample pathway is obstructed. • Improper ventilation / mouth piece not removed promptly	• Ventilate the area and retest the subject. • If the conditions persists and can not be corrected, put an out of service sign on the instrument and contact your local area supervisor.
RFI Detected	A strong source of radio frequency was detected by the instrument.	• Police radio transmission. • Intermittent transmissions from cell phones or wireless recording devices.	• Locate the source of the RF, eliminate it and retest the subject. • Turn off all cell phones and wireless devices.
Interferent Detected	There is a significant quantity of a volatile organic chemical in the subject's breath producing a response at the instrument's detector.	• Volatile or inhalant abuse • Metabolic or Diabetic ketosis • Foreign object in the subject's mouth	• Assess the subject, re-read implied consent and request a blood test.

Appendix A

Rules
of the
Georgia Bureau of Investigation

Chapter 92-3
Implied Consent

Rev. January 23, 2013

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RULES OF THE GEORGIA BUREAU OF INVESTIGATION

CHAPTER 92-3

IMPLIED CONSENT

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92-3-.01 Application; Information.

(1) This chapter applies to chemical analysis of a person's blood, breath or urine for the purpose of determining whether such person is under the influence of alcohol or drugs where such tests are required or authorized under the laws of this state. It does not apply to analysis of breath, blood or other bodily substances for other purposes, including, but not limited to, those:

(a) Performed in conjunction with a postmortem examination;
(b) Conducted by personnel employed by the Division of Forensic Sciences or by personnel employed by an agency of the United States;
(c) Performed pursuant to a court order;
(d) Performed as a condition of probation, parole or pretrial release;
(e) Performed for the purpose of determining paternity;
(f) For initial breath alcohol screening;(except where explicitly addressed)
(g) For the purpose of preliminary testing for alcohol or drugs by law enforcement before submission of samples to a laboratory for confirmatory testing;
(h) For DNA analysis; or
(i) For the purpose of medical diagnosis or treatment.

(2) Requests concerning the rules or laws administered by the Georgia Bureau of Investigation, Division of Forensic Sciences relative to the methods approved for breath, blood or urine analysis, pursuant to this Chapter, shall be made in writing to the Director,Division of Forensic Sciences of the Georgia Bureau of Investigation.

Authority O.C.G.A. Secs. 6-2-5.1, 27-3-7, 35-3-154, 40-6-392, 52-7-12. **History.** Original Rule entitled "Information" adopted. F. Apr. 11, 1986; eff. May 1, 1986. **Amended:** F. Aug. 31, 1998; eff. Sept. 20, 1998. **Amended:** Rule retitled "Application; Information". F. Feb. 24, 2000; eff. Mar. 15, 2000. **Amended:** F. Mar. 26, 2010; eff. Apr. 15, 2010.

92-3-.02 Qualifications. Amended.

(1) Pursuant to this chapter applicants for a permit to perform chemical analysis of a person's blood for alcohol content and report the results of such analysis as delineated in O.C.G.A. § 40-6-392 shall meet the following requirements:

(a) Be employed by an entity that is accredited in the area of forensic blood alcohol analysis by a nationally recognized accrediting body;
(b) Have never been convicted of a crime involving moral turpitude;
(c) Have completed a baccalaureate or advanced degree in chemistry, toxicology, medicine, pharmacology, or forensic science, including a minimum of 40 semester hours of chemistry related coursework;
(d) Have completed a documented training program in the area of blood alcohol analysis that includes the following elements:

1. Theory of alcohol pharmacology and pharmacokinetics;
2. Principles and theory of analytical techniques for blood alcohol analysis, e.g., head space gas chromatography and/or enzymatic methods;
3. Analysis of samples with known blood alcohol content using gas chromatography, enzymatic methods, or other generally accepted techniques;
4. Successful completion of proficiency test samples from the National Highway Transportation Safety Administration (NHTSA) and/or proficiency test samples from a test provider approved by the entity's accrediting authority described in 92-3.02(1)(a).

(e) Be an active participant in an ongoing external proficiency testing program.

(2) Applicants for a permit to perform chemical analysis of a person's breath pursuant to this Chapter shall meet the following requirements:

(a) be a citizen of the United States;
(b) be a resident of the State of Georgia or be employed within the State of Georgia;
(c) have never been convicted of a crime involving moral turpitude;
(d) be over twenty years of age;
(e) certified satisfactory completion of a course in breath analysis conducted under the auspices of the Division of Forensic Sciences.

(3) All peace officers qualified to make arrests on the highways or streets of this State shall be deemed, and are hereby declared, qualified to administer the screening test for alcohol in the breath. Screening tests are not intended to be a quantitative measure of the specific amount of alcohol in a person's breath, but a presumptive test for the presence or absence of alcohol. A list of approved breath alcohol screening devices will be maintained by the Division of Forensic Sciences.

(4) Pursuant to this chapter, applicants for a permit to perform chemical analysis of a person's blood or urine for drugs and report the results of such analysis as delineated in O.C.G.A. § 40-6-392 shall meet the following requirements:

(a) Be employed by an entity that is accredited in the area of toxicology analysis by a nationally recognized accrediting body;
(b) Have never been convicted of a crime involving moral turpitude;
(c) Have completed a baccalaureate or advanced degree in chemistry, toxicology, medicine, pharmacology, or forensic science, including a minimum of 40 semester hours of chemistry related coursework;
(d) Have completed a training program in the area of drug analysis from biological samples that includes the following elements:

1. Theory of drug pharmacology and pharmacokinetics;
2. Principles and theory of analytical techniques for drug analysis, including presumptive (e.g., immunoassay) and confirmatory techniques (e.g., gas chromatography/ mass spectrometry, liquid chromatography/ mass spectrometry/mass spectrometry);
3. Analysis of samples with known drug content using presumptive and confirmatory methods,
4. Successful completion of proficiency test samples from a test provider approved by the accrediting authority described in 92-3.02(4)(a). .

(e) Be an active participant in an ongoing external proficiency testing program.

(5) Applicants to perform, under supervision, chemical testing of a person's blood or urine for alcohol shall meet the following requirements:

(a) Be under the direct supervision of a person who possesses a valid permit to perform chemical tests as described in 92-3.02(1) and who is responsible for reviewing and reporting the results of all chemical tests performed by the applicant;
(b) Be a duly licensed registered nurse, certified medical technologist, or trained laboratory technician;
(c) Have completed a training program in the area of blood alcohol analysis that includes the following elements:

1. Principles and theory of analytical techniques for blood alcohol analysis, e.g., head space gas chromatography and/or enzymatic methods;
2. Analysis of samples with known blood alcohol content using gas chromatography, enzymatic methods, or other generally accepted techniques;
3. Successful completion of proficiency test samples provided by the National Highway Transportation Safety Administration (NHTSA) and/or proficiency test samples from a test provider approved by the entity's accrediting authority described in 92-3.02(1)(a).

(d) Be an active participant in an ongoing external proficiency testing program.

(6) Applicants to perform, under supervision, chemical testing of a person's blood or urine for drugs shall meet the following requirements:

(a) Be under the direct supervision of a person who possesses a valid permit to perform chemical tests as described in 92-3.02(4) and who is responsible for reviewing and reporting the results of all chemical tests performed by the applicant;
(b) Be a duly licensed registered nurse, certified medical technologist, or trained laboratory technician;
(c) Have completed a training program in the area of drug analysis from biological samples that includes the following elements:

1. Principles and theory of analytical techniques for drug analysis, including

presumptive (e.g., immunoassay) and confirmatory techniques (e.g., gas chromatography/ mass spectrometry, liquid chromatography/ mass spectrometry/mass spectrometry);
2. Analysis of samples with known drug content using presumptive and confirmatory methods;
3. Successful completion of proficiency test samples provided by a recognized test provider approved by the entity's accrediting authority described in 92-3.02(4)(a). .

(d) Be an active participant in ongoing external proficiency testing program.

Authority O.C.G.A. Secs. 6-2-5.1, 27-3-7, 35-3-154, 40-6-392, 52-7-12. **History.** Original Rule entitled "Qualifications" adopted. F. Apr. 11, 1986; eff. May 1, 1986. **Amended:** F. Aug. 9, 1988; eff. Aug. 29, 1988. **Amended:** F. Nov. 18, 1995; eff. Dec. 8, 1995. **Amended:** F. Feb. 24, 2000; eff. Mar. 15, 2000. **Amended:** F. Mar. 26, 2010; eff. Apr. 15, 2010.

92-3-.03 Application, Form of. Amended.

(1) Applications for permits to perform chemical analyses of a person's blood or breath pursuant to this Chapter shall be on a form prescribed and approved by the Georgia Bureau of Investigation and shall be submitted to the Division of Forensic Sciences, Implied Consent Section.

(2) Each applicant shall provide as a minimum the following data:

(a) the name of the individual seeking the permit;
(b) the email address, telephone number, fax number and mailing address of the individual seeking the permit;
(c) the name and mailing address of the applicant's employer, or if self-employed, the name and mailing address under and by which the applicant transacts business;
(d) place and date of the applicant's birth;
(e) the resident address of the applicant;
(f) responses to all questions or requests for information in the application;
(g) date of the application.
(3) Where the application is for a permit to perform chemical analyses of a person's blood or urine, the applicant shall provide the documentation necessary to demonstrate that the applicant has met all applicable qualifications.
(4) Where the application is for a permit to perform chemical analyses of a person's blood or urine the applicant shall identify the specific methods and techniques to be employed in the performance of the analyses.

Authority O.C.G.A. Secs. 6-2-5.1, 27-3-7, 35-3-154, 40-6-392, 52-7-12. **History.** Original Rule entitled "Application, Form of" adopted. F. Apr. 11, 1986; eff. May 1, 1986. **Amended:** F. June 10, 1987; eff. June 30, 1987. **Amended:** F. Nov. 18, 1995; eff. Dec. 8, 1995. **Amended:** F. Feb. 24, 2000; eff. Mar. 15, 2000. **Amended:** F. Mar. 26, 2010; eff. Apr. 15, 2010.

92-3-.04 Permits. Amended

(1) Permits to perform chemical analyses of a person's blood, urine, or breath pursuant to this Chapter will be issued by the Georgia Bureau of Investigation, Division of Forensic Sciences, Implied Consent Section.

(2) The Georgia Bureau of Investigation, Division of Forensic Sciences shall withhold the issuance of a permit where the application reveals information that the applicant has not or cannot qualify pursuant to Rule 92-3-.02.

(3) Separate and distinct permits shall be issued for:

(a) analysis and reporting of blood alcohol levels
(b) testing and reporting breath alcohol levels;
(c) analysis and reporting of drugs in blood and/or urine
(d) analysis of blood alcohol under supervision
(e) analysis of drugs in blood and/or urine under supervision.

(4) All permits are subject to revocation as provided by law and Rule 92-3-.08.

(5) Applications for all permits shall be filed with the Division of Forensic Sciences Implied Consent Section. Permits shall be valid for not more than four years from the date of issuance. Proof of successful completion of annual proficiency tests shall be required to maintain all permits for testing blood or urine for alcohol or drugs.

(6) Permit renewals to perform chemical analyses on a person's breath shall not be approved unless one refresher course in breath alcohol analysis conducted under the auspices of the Division of Forensic Sciences has been satisfactorily completed. Individuals possessing permits that are more than one year past the expiration date will not be allowed to renew their permits by attending a refresher course unless specifically authorized by the Director of the Division of Forensic Sciences or his or her designee. Additional refresher courses may be required at the discretion of the Director of the Division of Forensic Sciences.

(7) Existing permit holders may obtain a permit to operate instruments approved pursuant to this rule by the Division of Forensic Sciences for the chemical analysis of a person's breath by successfully completing a transition course in breath alcohol analysis under the auspices of the Division of Forensic Sciences.

Authority O.C.G.A. Secs. 6-2-5.1, 27-3-7, 35-3-154, 40-6-392, 52-7-12. **History.** Original Rule entitled "Permits" adopted. F. Apr. 11, 1986; eff. May 1, 1986. **Amended:** F. Nov. 18, 1995; eff. Dec. 8, 1995. **Amended:** F. Feb. 24, 2000; eff. Mar. 15, 2000. **Amended:** F. Mar. 26, 2010; eff. Apr. 15, 2010. **Amended:** F. Jan. 3, 2013; eff. Jan. 23, 2013.

92-3-.05 Form of Permit

Permits issued by the Division of Forensic Sciences authorizing individuals to perform chemical analyses of a person's blood, urine, or breath pursuant to this Chapter shall be in a form approved by the Division of Forensic Sciences. Permits will indicate the individual approved to perform analysis, an issue and expiration date, and the type of analysis approved to perform, i.e., breath alcohol, blood alcohol, or blood and urine drug testing. In addition the permit will clearly indicate whether testing must be performed under supervision. In the case of breath analysis the type of instrument approved for use will also be indicated.

(a) Form deleted.
(b) Form deleted.
(c) Form deleted.

Authority O.C.G.A. Secs. 6-2-5.1, 27-3-7, 35-3-154, 40-6-392, 52-7-12. **History.** Original Rule entitled "Forms of Permit" adopted. F. Apr. 11, 1986; eff. May 1, 1986. **Amended:** F. Feb. 24, 2000; eff. Mar. 15, 2000. **Amended:** F. Mar. 26, 2010; eff. Apr. 15, 2010.

92-3-.06 Techniques and Methods. Amended.

(1) Reserved

(2) All chemical tests on blood and/or urine not performed by Georgia Bureau of Investigation personnel must be performed on instruments approved by the Director of the Division of Forensic Sciences. Requests for approval of instruments to perform chemical testing of blood and urine along with proposed maintenance guidelines will be submitted to the Director of the Division of Forensic Sciences or his or her designee. Approval of such request is at his or her discretion pursuant to O.C.G.A. § 40-6-392. Upon approval of any testing instrument for the analysis of blood and/or urine a certificate of approval shall be issued detailing the agency, the date approved, the instrument serial number, and the date of the approval expiration. Such certificate shall be self authenticating and evidence that the instrument was approved by the Division of Forensic Sciences as required by O.C.G.A. § 40-6-392. Such approval shall not apply when any substantial modification to the instrument's original design has been made such that it no longer has all its parts attached and in working order as prescribed by the manufacturer or when the instrument is not in substantial compliance with the maintenance guidelines submitted. Failure to maintain testing instruments as stated in the guidelines for instrument maintenance may be considered grounds for revocation of the certificate of approval. Factors evaluated in the approval of maintenance guidelines for testing instruments shall include but are not limited to:

(a) Documentation of substantial compliance with the manufacturer's recommendations for maintenance;
(b) Documentation of all maintenance performed including the date, action taken, the individual performing the maintenance, and the results of the maintenance including acceptable performance of known quality control samples following such maintenance;
(c) Documentation that instrument maintenance is performed by individuals sufficiently trained to perform instrument maintenance;
(d) Documentation that the instrument has all its parts attached and in good working order as prescribed by the manufacturer;
(e) Documentation that the instrument is suitable for the purpose for which it is being used;
(f) Documentation of quality control measures to ensure reliable analysis such as positive and negative controls;
(g) Documentation that the instrument exhibits the sensitivity, resolution, and specificity necessary for its intended purpose and is evaluated for suitability prior to use.

(3) Types of instruments considered for confirmatory testing of blood or urine for drug content include gas chromatography mass spectrometry, gas chromatography tandem mass spectrometry, liquid chromatography mass spectrometry, liquid chromatography tandem mass spectrometry, or other comparable structural elucidation technique as determined by the Director of the Division of Forensic Sciences or his or her designee.

(4) Types of instruments considered for testing of blood for alcohol content include head space gas chromatograph, fluorescence polarization immunoassay, cloned enzyme donor immunoassay, enzyme immunoassay, or other comparable technique as determined by the Director of the Division of Forensic Sciences or his or her designee.

(5) Breath tests other than the original alcohol-screening test shall be conducted on a breath alcohol analyzer approved

by the Director of the Division of Forensic Sciences or his or her designee. Any other type of breath alcohol analyzer not specifically listed in this paragraph must be approved by the Director of the Division of Forensic Sciences or designee prior to its use in the State.

(a) The Intoxilyzer Model 5000 manufactured by CMI, Inc. is an approved instrument for breath alcohol tests conducted on or before December 31, 2015;

(b) The Intoxilyzer Model 9000 manufactured by CMI, Inc. is an approved instrument for breath alcohol tests conducted on or after January 1, 2013;

(6) All breath tests other than the original alcohol-screening test will be performed in accordance with Rule 92-3-.02(2) of these regulations. The operator's permit will be conspicuously displayed in the room and in the immediate vicinity of the place where the test is conducted, or the operator will have on his or her person or immediate possession for display upon request a valid permit in accordance with Rule 92-3-.02(2).

(7) All blood and urine drug tests will be performed by the Georgia Bureau of Investigation, Division of Forensic Sciences or by entities specifically approved by the Director of the Division of Sciences for this purpose. All entities approved by the Division of Forensic Sciences to perform chemical analyses of blood and urine for drugs shall be accredited by a nationally recognized accrediting body. A list of all entities approved for the purpose of conducting chemical tests for drugs will be kept on file at the Georgia Bureau of Investigation to be made available upon request. Approval of entities to perform chemical tests of blood or urine for drugs shall be at the discretion of the Director of the Division of Forensic Sciences or his or her designee. Such approval shall not apply when any substantial change to the method submitted has been made or when any person executing such method fails to substantially comply with the method as written when submitted for approval. Entities requesting approval to perform chemical tests of blood and/or urine for drugs must submit all methods used for chemical testing under O.C.G.A. § 40-6-392 as well as accompanying calibration procedures and validation documents. All blood and urine drug testing methods submitted to the Division of Forensic Sciences for approval shall be evaluated for the following:

(a) Whether the method is suitable for the purpose for which it was submitted;

(b) Whether the method employs a minimum of two analytical techniques for positive identification of an analyte where at least one of the techniques is structurally elucidating (e.g., gas chromatography/ mass spectrometry, liquid chromatography/ mass spectrometry or liquid chromatography/ mass spectrometry/mass spectrometry);

(c) Whether the method includes quality control measures to ensure reliable analysis such as positive and negative controls;

(d) Whether the method's accuracy and measurement uncertainty for quantification meet acceptance criteria as determined by the Director of the Division of Forensic Sciences or his or her designee. These acceptance criteria are based on minimum acceptability requirements set forth for the Division of Forensic Sciences and will be made available to the applicant agency on request;

(e) Whether the method's working range for quantification includes the relevant pharmacological concentrations for the analytes of interest;

(f) Whether the method is specific for the analytes of interest;

(g) Whether the method complies with a nationally recognized quality control standard such as ISO/IEC 17025.

(8) The Director, Division of Forensic Sciences:

(a) will cause each instrument used in the administration of breath tests to be checked periodically for calibration and operation and a record of the results of all such checks maintained;

(b) at his discretion may cause any operator administering breath tests to be checked for operating proficiency. Unsatisfactory operation proficiency checks shall be one of several criteria for permit revocation.

(9) All blood and/or urine alcohol tests will be performed in accordance with a quantitative Gas Chromatographic technique or any equivalent procedure comparable in accuracy to Gas Chromatography. Any method used by an entity other than the Division of Forensic Sciences will be evaluated for approval by the Director of the Division of Forensic Sciences or his or her designee and such approval shall be at his or her discretion. Upon approval of any testing method a certificate of approval shall be issued detailing the agency, the date approved, and the date of the approval expiration. Such certificate shall be self authenticating and evidence that the method submitted was approved by the Division of Forensic Sciences as required by law. Such approval shall not apply when any substantial change to the method submitted has been made or when any person executing such method fails to substantially comply with the method as written when submitted for approval. Entities requesting approval to perform blood and/or urine alcohol tests must submit all methods used for testing under O.C.G.A. § 40- 6-392 as well as accompanying calibration procedures and validation documents. Factors evaluated in the approval of testing methods by outside agencies shall include:

(a) Whether the method is generally accepted in the scientific community for the purpose for which it is being submitted;

(b) Whether the method employs replicate analysis;

(c) Whether the method includes quality control measures to ensure reliable analysis such as positive and negative controls;

(d) Whether the method's accuracy and measurement uncertainty for quantification meet acceptance criteria as determined by the Director of the Division of Forensic Sciences or his or her designee. These acceptance criteria are based on minimum acceptability requirements set forth for the Division of Forensic Sciences and will be made available to the applicant agency on request;
(e) Whether the method's working range for quantification includes all alcohol levels between 0.02 and 0.40 g/dL of blood or equivalent;
(f) Whether the method is specific for ethanol;
(g) Whether the method complies with a nationally recognized quality control standard such as ISO/IEC 17025.

(10) The Director of the Division of Forensic Sciences, at his discretion, may require any person authorized to perform chemical tests and/or report results of such testing of blood or urine to divide a specimen and after analysis submit it to the Director, with his report of the specimen. Alternatively, the Director may submit a sample of known alcohol or drug content to any person holding a permit to analyze blood or urine or require them to participate in an external proficiency testing program of his or her choice at his or her discretion. The failure to submit a sample or to satisfactorily analyze a specimen on request will be one of several criteria for revocation of a permit.

(11)Except as forbidden by law, a report of every evidential breath test, excluding initial alcohol-screening tests, shall be made by the individual authorized to issue such reports.

(12)(a) The methods approved by the Division of Forensic Sciences for conducting an evidential breath alcohol analysis shall consist of the following:
(1) the analysis shall be conducted on an approved instrument as defined in 92-3-.06 (5).
(2) the analysis shall be performed by an individual holding a valid permit, in accordance with Rule 92-3-.02 (2); and
(3) the testing instrument shall have been checked periodically for calibration and operation, in accordance with Rule 92-3-.06 (8)(a);

(b) Administrative, procedural, and/or clerical steps performed in conducting a test shall not constitute a part of the approved method of analysis.

Authority O.C.G.A. Secs. 6-2-5.1, 27-3-7, 35-3-154, 40-6-392, 52-7-12. **History.** Original Rule entitled "Techniques and Methods" adopted. F. Apr. 11, 1986; eff. May 1, 1986. **Amended:** F. Sept. 19, 1994; eff. Oct. 9, 1994. **Amended:** F. Nov. 9, 1994; eff. Nov. 29, 1994. **Amended:** F. Nov. 18, 1995; eff. Dec. 8, 1995. **Amended:** F. Nov. 12, 1997; eff. Dec. 2, 1997. **Amended:** F. Feb. 24, 2000; eff. Mar. 15, 2000. **Amended:** F. Mar. 26, 2010; eff. Apr. 15, 2010. **Amended:** F. Jan. 3, 2013; eff. Jan. 23, 2013.

92-3-.07 Fees and Billing. Amended.

The fee charged for the withdrawal of a person's blood pursuant to the O.C.G.A. 40-5-55 and 40-6-392 shall not exceed the reasonable and customary charges for such service in the local medical community. All statements for such services shall be submitted to and paid by the jurisdiction (municipal corporation or political subdivision) in which the arrest or accident giving rise to such a procedure occurred.

Authority O.C.G.A. Sec. 40-6-392, 27-3-7, 52-7-12, 6-2-5.1, 35-3-154(1). **History.** Original Rule entitled "Fees and Billing" was filed on April 11, 1986; effective May 1, 1986. **Amended:** F. May 27, 1993; eff. Jun. 16, 1993. Amended; F. February 24,2000; eff. March 15,2000.

92-3-.08 Revocation of Permit.

(1) The violation of any of the rules and regulations of the Georgia Bureau of Investigation promulgated under the provisions of the Uniform Rules of the Road by a permit holder shall constitute ground upon which the Director of the Division of Forensic Sciences may revoke such permit.

(2) If the Director of the Division of Forensic Sciences receives a complaint or has reason to believe that a permit holder is violating any provision of the rules and regulations, he shall notify such permit holder that a hearing will be held at a place and time designated by the Director to determine if the alleged infraction has occurred.

(3) The hearing shall be conducted by the Director of the Division of Forensic Sciences or by someone he shall designate.

(4) Upon revocation of a permit, the Director of the Division of Forensic Sciences or designee shall notify the permit holder, the permit holder's immediate supervisor and the Court(s) of the county or city where the permit holder is employed and in which the results of any tests performed by the permit holder could have been introduced as evidence.

Authority O.C.G.A. Secs. 6-2-5.1, 27-3-7, 35-3-154, 40-6-392, 52-7-12. **History.** Original Rule entitled "Revocation of Permit" adopted. F. Apr. 11, 1986; eff. May 1, 1986. **Amended:** F. Mar. 26, 2010; eff. Apr. 15, 2010.

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TABLE 1

Guide to Estimating Approximate Body Alcohol Concentration

Average Male Physiology – 17% Body Fat (Vd = 0.7L/kg)

	No.of standard drinks (0.6 oz ethanol: 5%-12 oz beers, 12%-5 oz wine)											
Weight (lb)	1	2	3	4	5	6	7	8	9	10	11	12
100	0.044	0.088	0.132	0.176	0.220	0.264	0.308	0.352	0.396	0.441	0.485	0.529
110	0.040	0.080	0.120	0.160	0.200	0.240	0.280	0.320	0.360	0.400	0.441	0.481
120	0.037	0.073	0.110	0.147	0.184	0.220	0.257	0.294	0.330	0.367	0.404	0.441
130	0.034	0.068	0.102	0.136	0.169	0.203	0.237	0.271	0.305	0.339	0.373	0.407
140	0.031	0.063	0.094	0.126	0.157	0.189	0.220	0.252	0.283	0.315	0.346	0.378
150	0.029	0.059	0.088	0.117	0.147	0.176	0.206	0.235	0.264	0.294	0.323	0.352
160	0.028	0.055	0.083	0.110	0.138	0.165	0.193	0.220	0.248	0.275	0.303	0.330
170	0.026	0.052	0.078	0.104	0.130	0.155	0.181	0.207	0.233	0.259	0.285	0.311
180	0.024	0.049	0.073	0.098	0.122	0.147	0.171	0.196	0.220	0.245	0.269	0.294
190	0.023	0.046	0.070	0.093	0.116	0.139	0.162	0.185	0.209	0.232	0.255	0.278
200	0.022	0.044	0.066	0.088	0.110	0.132	0.154	0.176	0.198	0.220	0.242	0.264
210	0.021	0.042	0.063	0.084	0.105	0.126	0.147	0.168	0.189	0.210	0.231	0.252
220	0.020	0.040	0.060	0.080	0.100	0.120	0.140	0.160	0.180	0.200	0.220	0.240
230	0.019	0.038	0.057	0.077	0.096	0.115	0.134	0.153	0.172	0.192	0.211	0.230
250	0.018	0.035	0.053	0.070	0.088	0.106	0.123	0.141	0.159	0.176	0.194	0.211
270	0.016	0.033	0.049	0.065	0.082	0.098	0.114	0.131	0.147	0.163	0.179	0.196
290	0.015	0.030	0.046	0.061	0.076	0.091	0.106	0.122	0.137	0.152	0.167	0.182

Average Female Physiology – 29% Body Fat (Vd = 0.6 L/kg)

	No.of standard drinks (0.6 oz ethanol: 5%-12 oz beers, 12%-5 oz wine)											
Weight (lb)	1	2	3	4	5	6	7	8	9	10	11	12
100	0.051	0.103	0.154	0.206	0.257	0.308	0.360	0.411	0.463	0.514	0.565	0.617
110	0.047	0.093	0.140	0.187	0.234	0.280	0.327	0.374	0.421	0.467	0.514	0.561
120	0.043	0.086	0.128	0.171	0.214	0.257	0.300	0.343	0.385	0.428	0.471	0.514
130	0.040	0.079	0.119	0.158	0.198	0.237	0.277	0.316	0.356	0.395	0.435	0.474
140	0.037	0.073	0.110	0.147	0.184	0.220	0.257	0.294	0.330	0.367	0.404	0.441
150	0.034	0.069	0.103	0.137	0.171	0.206	0.240	0.274	0.308	0.343	0.377	0.411
160	0.032	0.064	0.096	0.128	0.161	0.193	0.225	0.257	0.289	0.321	0.353	0.385
170	0.030	0.060	0.091	0.121	0.151	0.181	0.212	0.242	0.272	0.302	0.333	0.363
180	0.029	0.057	0.086	0.114	0.143	0.171	0.200	0.228	0.257	0.286	0.314	0.343
190	0.027	0.054	0.081	0.108	0.135	0.162	0.189	0.216	0.243	0.271	0.298	0.325
200	0.026	0.051	0.077	0.103	0.128	0.154	0.180	0.206	0.231	0.257	0.283	0.308
210	0.024	0.049	0.073	0.098	0.122	0.147	0.171	0.196	0.220	0.245	0.269	0.294
220	0.023	0.047	0.070	0.093	0.117	0.140	0.164	0.187	0.210	0.234	0.257	0.280
230	0.022	0.045	0.067	0.089	0.112	0.134	0.156	0.179	0.201	0.223	0.246	0.268
250	0.021	0.041	0.062	0.082	0.103	0.123	0.144	0.164	0.185	0.206	0.226	0.247
270	0.019	0.038	0.057	0.076	0.095	0.114	0.133	0.152	0.171	0.190	0.209	0.228
290	0.018	0.035	0.053	0.071	0.089	0.106	0.124	0.142	0.160	0.177	0.195	0.213

TABLE 2

Stages of Acute Alcoholic Influence and Intoxication

Adapted from work by Dr. Kurt Dubowski

Blood Alcohol Concentration (g's)	Stage of Intoxication	Clinical Signs and Symptoms
.01 to 0.04	Near Sobriety	Behavior nearly normal by ordinary observation. Slight impairment detectable by specialized tests. Subject can feel effects of alcohol
0.03 to 0.12	Euphoria	Mild euphoria and sense of well being. Increased sociability and talkativeness. Increased self-confidence and decreased inhibitions. Decreases in attention, judgment and reaction time. Onset of muscular incoordination
0.09 to 0.20	Excitement	Emotional instability and decreased inhibitions. Loss of critical thinking and judgment. Marked generalized muscular incoordination and slurred speech.
0.18 to 0.30	Confusion	Disorientation and mental confusion. Exaggerated emotional states (e.g. fear, anger, joy, etc.). Gross muscular incoordination, slurred speech and staggering gait.
0.27 to 0.40	Stupor	Apathy, general inertia and a marked decrease in response to stimuli. Inability to stand or walk. Vomiting. Stuporous or unconscious.
0.30 to 0.40	Coma	Complete unconsciousness or coma. Depressed reflexes. May experience respiratory or cardiac difficulties.
0.40 or greater	Death	Death possible due to respiratory or cardiac arrest or choking due to aspirated vomit.

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GEORGIA BUREAU OF INVESTIGATION

3121 Panthersville Road
P.O. Box 370808
Decatur, Georgia 30037-0808

June 1, 2013

To: All Breath - Testing Agencies

1.) The Implied Consent Section of the Georgia Bureau of Investigation Division of Forensic Sciences approves alcohol screening devices for use as an investigative tool. These devices are approved for law enforcement personnel to use for the preliminary determination of alcohol concentration.

2.) The following devices are approved by the Division of Forensic Sciences for performing alcohol screening tests: the Alcolyzer manufactured by Intoximeter, Inc.; the Alco-Sensor, Alco-Sensor III and RBT utilizing the Alco-Sensor III, Alco-Sensor IV, Alco-Sensor V XL and the Alco-Sensor FST manufactured by Intoximeter, Inc.; the A.L.E.R.T. system manufactured by Alcohol Countermeasure System, Inc.; the CMI Model SD-2 manufactured by Lion; the CMI Model SD-5, Intoxilyzer Model 300 and Model 400 manufactured by CMI, Inc.; the Lifeloc Model FC10, FC10 Plus, and FC20 Alcohol Analyzer manufactured by Lifeloc Technologies, and the Alcotest 6510 and 6810 manufactured by Draeger Safety Inc., the Mark V Alcovisor manufactured by PAS Systems International Inc.

3.) The above devices have been evaluated and have been found suitable for use as alcohol screening devices.

LUANNE C DUNCAN
MY COMMISSION EXPIRES
NOTARY
PUBLIC
MAY 21, 2015
ROCKDALE COUNTY, GEORGIA

Christopher S. Tilson, B.S.
Manager, Implied Consent
Division of Forensic Sciences

Sworn to and subscribed
before me this the 26 day
of June, 2013.

Notary Public
My commission expires 5/21, 2015.

Division of Forensic Sciences
P.O. Box 370808
Decatur, Georgia 30037-0808

Investigative Division
P.O. Box 370808
Decatur, Georgia 30037-0808

Georgia Crime Information Center
P.O. Box 370808
Decatur, Georgia 30037-0808

Georgia Bureau of Investigation
Division of Forensic Sciences

Certificate of Inspection

This breath-testing instrument, _____, was thoroughly inspected, tested, and standardized by the undersigned on _____ and all of its electronic and operating components prescribed by its manufacturer are properly attached and are in good working order.

Sworn to and subscribed before me this _____ day of _____ 20____.

_____
Notary Public

_____
Implied Consent Area Supervisor

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APPENDIX

RECENT COURT DECISIONS AFFECTING DUI/ IMPLIED CONSENT LAW

Miranda and Implied Consent

237 Ga. App. 362; Scanlon v. State

Miranda not required prior to reading Implied Consent notice to subject in custody. Does not violate the constitutional right of due process and privilege against self incrimination. Also See 236 Ga. App. 868; State v. Lord & State v. Rosier and243 Ga. App. 232; State V. Coe, 237 Ga. App. 764; The State v. Moses

269 Ga. 222 (Supreme Court); Price v. State

Miranda warnings must be given before administering field sobriety evaluations on a subject considered **" in custody"**. The test of "in custody" is whether "a reasonable person in the suspect's position would have thought the detention would not be temporary".

245 Ga. App. 466; Arce v. State

The court held "The officer did not have to administer *Miranda* warning to defendant before administering the field sobriety tests during a routine roadside questioning, because defendant was not under formal arrest but exhibited many physical manifestations of intoxication amounting to probable cause to arrest."

Intoxilyzer and Refusals

237 Ga. App. 236; Komala v. State

Unless encumbered by a physical or medical limitation, a person submitting to the breathalyzer test may be considered to have refused to comply if an adequate breath sample has not been provided. "…the arresting officer testified unequivocally that (Komala) failed… to provide an adequate breath sample and that the instrument did not produce a printed alcohol concentration analysis, which was objective evidence of (her) refusal."

236 Ga. App. 632; Miles v. State

" A defendant's refusal to permit a chemical analysis to be made of his blood, breath, urine, or other bodily substance at the time of his arrest is admissible in evidence against him in any criminal trial." …silence in the face of a request to take such a test shall not be treated differently than a refusal.

246 Ga. App 423; Chamberlain v. State

After being read her Implied Consent rights, Chamberlain submitted to a breath test and on the first sample produced an adequate sample with a printed result. She failed to provide an adequate breath on the second sample and stated because of a respiratory infection could not blow sufficiently. Chamberlain then requested an independent blood test due to her inability to produce a second sufficient breath sample. The Appeals Court ruled the statute expressly provides that a refusal to give a subsequent sample shall not affect the admissibility of the results of any prior sample. The fact that Chamberlain **failed or refused** to provide a second sample, as requested by the State, did not affect the admissibility of the results of the first sample. But the State's test results were rendered inadmissible when Chamberlain was denied the right of an independent test without justification. After providing a breath sample sufficient to cause the breath-testing instrument to produce a printed alcohol concentration analysis on the state-administered breath test, Chamberlain was entitled to the blood test she requested. The unjustified failure to provide the test is a violation of the statute and precludes the State from introducing evidence regarding its test.

2008 Ga App Lexis 696 Thrasher v State A08A0538

It would make little sense to hold that the result of the first test was inadmissible due to the defendant's inability to immediately give a second breath sample when a complete refusal or failure to take a second test does not affect the admissibility of the results of the first sample.

266 Ga App 762 Collier v. State S04G1409

A suspect refusing to submit to a chemical test under the Implied Consent statute was coerced to provide a sample and thus the results of the test were suppressed. The police threatened the suspect by saying they would obtain a warrant and forcibly draw blood if the suspect did not comply with the Implied Consent request. The Implied Consent statute grants the suspect an opportunity to refuse to take a blood alcohol test.

(Note: OCGA 40-5-67.1 was amended in 2006 to read "(d.1) Nothing in this Code section shall be deemed to preclude the acquisition or admission of evidence of a violation of Code Section 40-6-391 if obtained by voluntary consent or a search warrant as authorized by the Constitution or laws of this state or the United States.")

2009 Ga App Lexis 26 State v Quezada A08A1803

The court ruled that simply asking someone a second time if they wanted to submit to a chemical test was not equivalent to coercion. "A police officer may attempt to persuade a suspect to rescind her initial refusal to submit to chemical testing, so as long as any procedure utilized by an officer in attempting to persuade a defendant to rescind his refusal is fair and reasonable." Note that simply telling the subject to blow into the instrument after a refusal was not considered "fair and reasonable." (See Howell v State)

266 Ga App 480 Howell v. State

After refusing to undergo chemical testing pursuant to an implied consent reading, Howell was placed in front of an Intoxilyzer 5000 and instructed to comply. The court found that Howell did not voluntarily rescind his refusal and that the state's test should be suppressed. "In order to be effective, a subsequent consent after a refusal must be made: (1) within a very short and reasonable time after the prior first refusal; (2) when the test administered upon the subsequent consent would still be accurate; (3) when the testing equipment is still readily available; (4) when honoring the request would result in no substantial inconvenience or expense to the police and (5) when the individual requesting the test has been in the custody of the arresting officer and under observation for the whole time since arrest." (See DPS v Seay A92A0826)

270 Ga App 301 The State vs. Simmons

The court found no basis to permit the withdrawal of consent to State testing once consent has been given and is an accomplished fact.

270 Ga App 709 Shaheed v. The State

This case vacated a conviction of DUI less safe where the conviction was based upon the refusal of the subject to submit to both the field sobriety evaluations and the chemical test. The appellate court ruled "Shaheed was a less safe driver solely on the smell of alcohol and his refusal to submit to field sobriety tests and chemical testing. Accordingly, because there was nothing from which the jury could have inferred that [Shaheed] was under the influence of [alcohol] to the extent that he was a less safe driver, such as additional evidence of his physical condition or conduct at the time of his arrest, his conviction…must be set aside." While "refusal to submit to chemical testing may be considered as positive evidence creating an inference that the test would show the presence of alcohol, it also does not create an inference that he had impaired driving ability as a result of drinking alcohol."

A05A1491 Hoffman v. The State.

Refusal to submit to field sobriety tests ... is admissible as circumstantial evidence of intoxication and together with other evidence would support an inference that the suspect was an impaired driver.

286 Ga App 712 Horne v State A07A1563

In this case Horne submitted to field sobriety but refused chemical testing. Horne then challenged the sufficiency of the evidence regarding his DUI conviction. The court ruled to prove impairment, the State may present evidence of three types: "(i) erratic driving behavior, (ii) refusal to take field sobriety tests and the breath or blood test, and (iii) the officer's own observations (such as smelling alcohol and observing strange behavior) and resulting opinion that the alcohol made it less safe for the defendant to drive. (i) Manner of driving. Where there is evidence, as here, that the defendant has been drinking, the manner of his driving may be considered on the question of whether he has been affected by alcohol to the extent that he is less safe to drive. (ii) Refusal to undergo tests. Horne's "refusal to submit to an alco-sensor test and to a later chemical test of [his] breath is circumstantial evidence of [his] guilt." Together with other evidence, such refusals "would support [the] inference that [Horne] was an impaired driver." (iii) Officer's observations and opinion. A police officer may give opinion testimony as to the state of sobriety of a DUI suspect and whether appellant was under the influence to the extent it made him less safe to drive

283 Ga App 814 State v Brookbank A06A2036

Trial court erred in suppressing defendant's refusal to submit to a breath test, as the implied consent notice given was substantially accurate and timely given, and irrespective of whether the refusal resulted from defendant's confusion, it nevertheless remained a refusal. The deputy explained the implied consent law to Brookbank, but Brookbank simply disagreed with the deputy's explanation. The court emphasized that the law does not require the arresting officer to ensure that the driver understands the implied consent notice and the officer was under no duty to give further warnings or instructions after the implied consent warning was given properly at the time of arrest.

286 Ga App 542 Stewart v State A07A0232

Because Detective Doyle read Stewart the implied consent notice in an accurate and timely fashion, that notice was valid irrespective of Stewart's claimed inability to understand it. As a result, even if Stewart's subsequent refusal to provide a breath sample resulted from a failure to comprehend the consequences of his conduct, it is nevertheless admissible against him. As the term "implied consent" indicates, "every driver's consent to a chemical test for intoxication is implied by law." Specifically, everyone who operates a motor vehicle in Georgia implicitly consents to the chemical testing of their bodily fluids in the event they are arrested for DUI, but they may revoke that consent by refusing to submit to such testing. In all cases the court is required to find only that the implied consent law was conveyed to the … driver. The State is under no duty to prove [that] the … driver fully understood his rights under [that] law. To hold otherwise, and allow an intoxicated driver's professed inability to understand the implied consent warning to vitiate either the implied consent or the revocation of it, would so undermine OCGA § 40-5-55 (a) as to render it meaningless. Indeed, such a holding would actually benefit most those drivers who pose the greatest threat on the road — i.e., those who are so impaired that, even though conscious, are unable to comprehend their circumstances.

Request for an attorney before submitting to an Implied Consent test

281 Ga 306 Rackoff v State (Ga Supreme)

DUI suspects are not entitled to consult with a lawyer before deciding whether to submit to a breath test under the Sixth Amendment or the Georgia Constitution.

Also see 209 Ga. App. 270; Bowman v. Palmour

244 Ga. App. 123; Fairbanks v. State

The court affirmed Fairbanks' conviction of DUI, holding that his repeated response that he wanted an attorney present each time the arresting officer asked if he would submit to a chemical test amounted to a refusal to submit to testing, authorizing the admission into evidence of his refusal.

253 Ga. App. 412, State v. Boger

The appellate court held that the trial court erred in excluding appellee's failure to submit to the alco-sensor test at the scene of the stop because appellee's refusal could not have been based on a belief that he was entitled to an attorney prior to taking the test. However, the court held that evidence as to the test provided at the police station should be suppressed, as appellee, misled by the police officer, believed that he was entitled to an attorney prior to submitting to such test.

Use of Blood/Urine Samples obtained pursuant to Implied Consent Law

228 Ga. App. 825; The State v. Jewell

Blood and urine samples taken from the suspect pursuant to the Implied Consent Law for the purpose of determining if the defendant is under the influence of alcohol or drugs cannot be used for prosecution of drug possession. "This court held that consent for one purpose does not mean for ANY purpose, and therefore the consent was not the product of an essentially free and unrestrained choice."

Certificates of Inspection Admissibility

224 Ga. App.890; Harmon v. State

The certificates required by OCGA 40-6-392 (f) are not "tests which generally are carried out during the course of the investigation of a crime", and, therefore, the certificates are "not the type of investigation-generated written scientific report subject to the discovery provisions of OCGA 17-7-211." Instead, these inspections are conducted without regard to the investigation of any particular crime or case, but are done to assure the breath-testing instruments are periodically inspected, tested, and standardized, and that all the electronic and operating components are properly attached and are in good working order. Accordingly, the trial court did not err in allowing the certificate of inspection to be introduced even though it was not provided to Harmon before trial.

236 Ga. App. 842; Andries v. State

…the trial court did not err in admitting photocopies of the certificates of inspection in this case. Officer testified that he was familiar with the documents and that he recognized them as photocopies of the original certificate posted next to the Intoxilyzer 5000 on which the defendant was tested. Also see 238 Ga. App. 442; Wright v. State

Operator's Permit

240 Ga. App. 461; Prindle v. State

Given the undisputed evidence that the officer conducting the test was trained to use the machine used here, took a refresher course on its use, and had a certificate that was valid on its face on the date of the test, we find that the state satisfied its burden of proving the officer had a valid permit.

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MORE THAN TWO SEQUENTIAL BREATH TESTS

237 Ga. App. 817; Davis v. State

After providing two breath tests with adequate breath samples in which the results exceeded the 0.020 allowed difference. The subject was requested to take a third test which was within the 0.020 limit. The court ruled this test not admissible because OCGA 40-6-392 (a)(1)(B) provides only two tests with adequate breath samples can be requested.

INTOXILYZER OPERATING PROPERLY

225 Ga. App. 678; Renschen v. State

The state showed that the machine used was certified as being in good working order by the Division of Forensic Sciences of the Georgia Bureau of Investigation. The officer who performed the test on Renschen also testified that the machine was in good working order and was performing properly. This was sufficient to satisfy the statutes' requirements.

237 Ga. App. 875; Lanier v. State

"…the State introduced a certificate of inspection performed before the defendant's test and after the defendant's test showing the machine was operating properly. In addition, the operator testified that the instrument was operating properly at the time he performed the test on the defendant. …an inspection directly before and after each defendant's test is not required."

Intoxilyzer and *margin of error* (Sampling Variability)

248 Ga. App. 806; Bagwell v. State

The trial court did not err in denying his motion for a directed verdict on the per se charge. The Intoxilyzer's margin of error related to the weight given the test results rather than their admissibility, and the test results were direct evidence of guilt.

Also See 235 Ga. App. 791; Cawthon v. State

DUI Drugs

271 Ga. Supreme 398; Love v. State

The Court reversed appellant's conviction of driving with marijuana in his blood or urine, holding that the statute is an unconstitutional denial of equal protection. The Court held that the distinction between users of legal and illegal marijuana in the statute was arbitrarily drawn and was not directly related to the public safety purpose of the legislation.

272 Ga. Supreme 733; Ayers v. State

The court affirmed the trial court's refusal to dismiss criminal charges against Ayers, and held that the equal protection of law articulated in *Love v. State* does not preclude an indictment which charges reckless driving and first degree vehicular homicide through reckless driving where the reckless driving is based upon consumption of marijuana.

Sandlin v State A10A2197

The court ruled that Sandlin was not required to prove that he was legally entitled to use alprazolam in order to assert an equal protection challenge to 40-6-391 (a)(6) as articulated in Love v State.

248 Ga. App. 474; Keenum v. State

"Legal " cocaine use. Keenum was convicted of driving under the influence of drugs. On appeal, he contended that OCGA 40-6-391(a) (6) had been held unconstitutional by the Supreme Court in *Love v. State.* Affirming, the court held that while there could be instances of legal marijuana use, there would never be an instance of legal cocaine use so as to make the statute an unconstitutional denial of equal protection as to a cocaine intoxication charge.

302 Ga. App 753 Myers v State A10A0106

"DUI is a crime of general not specific intent. The state does not have to prove that the defendant intended to drive under the influence, only that the defendant was in an intoxicated condition and that she intended to drive...Voluntary intoxication is not an excuse for any criminal act."

Qualifications of person drawing blood

272 Ga. Supreme 169; Peek v. State

To be admissible the qualifications of the person drawing the blood must be proven by one of two ways. 1. The State may call as a witness the person who withdrew the blood and have that person testify as to his or her qualifications. (Harden v. State, 210 Ga. App. 673). 2. The State may produce a certification by the office of the Secretary of State or by the Department of Human Resources that a person was qualified to draw blood as required by OCGA 40-6-392.

{Statute was amended in 200l legislation to include the testimony under oath of the blood drawer's supervisor or medical records custodian that the blood drawer was properly trained and authorized to draw blood as an employee of the medical facility or employer.}

Challenge. Implied Consent Notice; OCGA 40-5-67.1; OCGA 40-5-55(a)

272 Ga. Supreme 605; Klink v. State; Watt v. State

The Court held that OCGA 40-5-67.1, that provides for the notice of implied consent to chemical testing, was not unconstitutional.

275 Ga. Supreme 309; Young v. State

The Court denied the motion to suppress the results of the state-administered breath tests based on the alleged unconstitutionality of the implied consent warning provision of OCGA 40-5-67.1. The implied consent warning did not violate the equal protection clause, as discriminating against persons charged with DUI, because it did not inform them that the results of a chemical test can be used against them at trial.

275 Ga. Supreme 283; Rodriguez v. State

The trial court did not err by failing to suppress the results of the state-administered blood alcohol tests because his implied consent warnings were not given to him in Spanish. Neither due process nor equal protection require the implied consent warnings to be given in a language the driver understands. (ref. State v. Tosar; 180 Ga. App.885.)

246 Ga. App. 344; Crawford v. State

The officer read the Implied Consent Notice before formally placing Crawford under arrest. After the rights were read to Crawford, she agreed to submit to an alcosensor evaluation. The test was positive for alcohol. The officer placed her under arrest and transported her to jail where she agreed to take the state administered breath test. Crawford appeals that the implied consent notice was not read at the time of arrest, and that because the officer read the notice just before asking her to take the alcosensor field test, she was confused and deprived of the right to make an intelligent decision whether she should take the state administered test. The Court held Crawford was not free to leave even before the administration of the alcosensor test, the reading of the notice was done at the "time of arrest" as required by the statute. The Court agreed with Crawford that the implied consent notice should not be read before the administration of the alcosensor test because that may mislead the driver into believing that he or she is required to submit to that test. The Court was not persuaded by Crawford's argument that the timing of the reading was so confusing that she was unable to make an intelligent decision about whether to submit to the state administered test. However, had she refused to take the state administered test, thereby suffering adverse consequences, she would have a better argument that she was confused about whether to submit to the state test.

277 Ga. Supreme 282; Cooper v. State

Cooper was convicted of DUI after submitting to a blood test that was administered because Cooper was involved in a traffic accident resulting in serious injuries. Reversing, the court held that to the extent that OCGA 40-5-55(a) requires chemical testing of a driver involved in an accident resulting in serious injuries or fatalities regardless of **probable cause**, it authorizes **unreasonable searches and seizures** in violation of the Georgia and United States Constitutions.

Hough v. State S05G0311 and Handschuh v. State S06G0640

The state may constitutionally require a suspect who has not yet been arrested to submit to a chemical test of his blood, breath, urine, or other bodily substances where the suspect has been involved in a traffic accident resulting in serious injuries or fatalities (as defined by 40-5-55) and the investigating law enforcement officer has probable cause to believe that the suspect was driving under the influence of alcohol or other drugs... in circumstances where there has been no traffic accident resulting in serious injuries or fatalities but the law enforcement officer has probable cause to believe that the suspect was driving under the influence of alcohol or other drugs, the suspect must be arrested prior to a reading of implied consent.

285 Ga App 18 State v. Austell A062171

Trial court properly granted defendant's motion to suppress the results of a chemical test of his blood based on the undue delay between his arrest, after a traffic stop, and the reading of his implied consent warnings.

The Trooper testified that he delayed reading Austell his rights because, with everything that had taken place, he felt that it would be safer for him to get Austell to the jail where it would be lighted, where others would be, rather than just reading Austell his rights on the interstate with only the two of them present. The trooper in this case was forced to subdue Austell due to the fact that he resisted arrest. The court opined that "although we are mindful of the difficulties the Trooper had with Austell, various opportunities existed for him to read Austell his rights before he did, and our law demands that the rights be read "at the time of arrest, or at a time as close in proximity to the instant of arrest as the circumstances of the individual case might warrant."

283 Ga App 872 Dunbar v State A07A0496

Approximately 25 minutes elapsed between the time the officer handcuffed Dunbar and the time the officer read her the implied consent notice. Dunbar argues that the 25-minute delay did not satisfy the requirement in OCGA § 40-6-392 (a) (4) to read the implied consent notice "at the time of arrest." However, the notice is deemed timely if it is given "at a time as close in proximity to the instant of arrest as the circumstances of the individual case might warrant." Here, the officer called a tow truck because he determined that neither occupant of Dunbar's vehicle was fit to drive. He therefore inventoried the vehicle before releasing it to the tow truck. He also evaluated the intoxicated passenger to rule out any safety threats posed by him or potential

weapons in Dunbar's vehicle. As the tow truck arrived, and before transporting Dunbar to the sheriff's office, the officer read Dunbar the notice. In light of the circumstances of this case, we affirm the trial court's ruling that the delay in reading the implied consent notice was warranted.

285 Ga App 640 State v Underwood A07A0576

Because the trial court's finding that defendant was under arrest only for the possession of drug-related items at the time the implied consent notice was read to him, although probable cause existed to arrest him for DUI, its order excluding the results of the state-administered breath test was upheld on appeal.

Independent Blood Test Request

245 Ga. App. 750; Joel v. State

Joel was stopped for DUI in Forsyth County and took the state-administered chemical test at the sheriff's office. He then asked to be taken to Northside Hospital in Atlanta for an independent test. The arresting officer, protesting that it would be "too dangerous for me to take him that far into metro Atlanta," took him to North Fulton Hospital for his blood test. Reversing the trial court's denial of Joel's motion to exclude the results of the state-administered test, the court held that Joel's statutory right to an independent test of his own choosing under OCGA 40-6-392 (a)(3) was violated when he was denied the right to a test at a facility of his choice that was "reasonably close."

Other cases: State v. Hughes; 181 Ga. App. 464, O'Dell v. State; 200 Ga. App. 655, Akin v. State; 193 Ga. App. 194.

254 Ga. App. 807; Hendrix v. State

Request for an additional test outside arresting officer's jurisdiction by 25-30 miles not reasonable considering officer offered to take suspect to **any local hospital** he wanted and that the requested facility would take 1 hour travel time round-trip. Factors considered when determining if a request is reasonable include: (1) availability of or access to funds or resources to pay for the requested test; (2) a protracted delay in giving of the test if the officer complies with the accused's requests; (3) availability of police time and other resources; (4) location of the requested facilities…and (5) opportunity and ability of the accused to make arrangements personally for testing.

255 Ga. App.685; State v. Braunecker

The appeals court affirmed the trial court's suppression of the state administered breath test and held the police denied appellant the opportunity to have an independent blood test. The appellant made the request to the booking officer while being photographed. The request was made 30 minutes after the breath test, the booking officer did not inform or make attempt to contact the arresting officer. (See *Covert v. State;* 196 Ga. App. 679 request made to jailer within hour of breath test resulted in suppression of test result.)

256 Ga. App. 726: Ladow V. State

The court reversed the trial court's admission of the state administered blood test in Ladow's DUI case, holding that her request "I want a blood test." was for an additional, independent blood test and the state's failure to accommodate it foreclosed introduction of the state administered test.

256 Ga. App. 749: State v. Schmidt

When Schmidt was pulled over for erratic driving he refused to submit to a breath test and requested an independent blood test. Once he was at the jail, he consented to the breath test, after having been read his implied consent rights again, but refused to provide a second breath sample. He did not repeat his request for a blood test. Affirming the trial court's suppression of the breath test results, the court held that Schmidt's refusal to provide a second breath sample does not preclude him from his right to an independent test.

263 Ga. App.222; Cole v. State

Cole was arrested for DUI on Memorial Day and requested an independent blood test. The arresting officer took him to the Houston Medical Center emergency room where blood was drawn but the lab was closed for the holiday. The officer testified that he was unaware of any place that would be open to test the blood given the holiday and the time. The officer stated that he did not attempt to contact either of the other two possible facilities he knew of in the area, apparently based on his assumption that they would also be closed. . And the record shows that the officer did not suggest any other testing alternatives, such as calling Cole's personal physician or his lawyer, or submitting the sample to the State's crime lab. Reversing denial of Cole's motion to suppress, the court held that an arresting officer has a duty to make **reasonable efforts** to accommodate a request for an independent blood test and failed to make such efforts here; and did not explore any alternative testing measure after discovering Houston Medical Center was closed. A blood sample is not the same as a legally admissible blood test, regardless of whether the blood sample could conceivably have been later used to obtain an independent test.

221 Ga App 274 Hulsinger v State A96A0631

Once an individual requests an independent test, the officer's concomitant duty to accommodate arises and continues until the accused obtains an admissible test or until it is determined that, despite reasonable efforts, such a test can not be obtained. In Hulsinger v. State, the officer gave Hulsinger a phone and a phone book, and Hulsinger arranged a test at a nearby hospital. After the nurse drew his blood, she told Hulsinger that he would have to contact his lawyer about having it tested. The officer suggested that he contact his lawyer or a doctor, and he offered to store the sample for Hulsinger. The court ruled that, there was some evidence, although slight, that the officer had tried to help solve the problem encountered at the hospital. Furthermore, Hulsinger did not produce evidence that a test could be performed anywhere nearby at that hour.

282 Ga App 63 Whittle v State A06A1134

Whittle was arrested for DUI, took the state's test and requested an independent test. The arresting officer testified that Whittle was unfamiliar with the area and asked the officer to recommend a hospital where a blood test could be obtained. He stated that he recommended Emory Adventist and that Whittle agreed. Whittle, on the other hand, testified that he did not want to have the test performed at Emory Adventist Hospital because he was not familiar with that facility. Whittle claimed that he requested and suggested four other hospitals for his independent test. The officer acknowledged that there was some discussion about testing at Kennestone Hospital, but stated that Kennestone was not a viable option and that he had been advised by the hospital staff that Kennestone and the other Wellstar-affiliated hospitals were no longer performing independent tests on persons who were not being admitted to the hospitals for medical reasons. Whittle failed to provide any evidence to refute the officer's testimony, or to otherwise show that his requested hospitals were available for testing at that time. Here, the trial court found that the officer made a reasonable effort to accommodate Whittle's request for an independent blood test.

274 Ga App 248 Koontz v State A05A0284

Koontz took the state's test and requested and independent test. Although Deputy Williams helped Koontz get money and took him to the hospital, he knew that Koontz could not get his blood tested there at that time, and he took no additional steps whatsoever to assist Koontz. He saw the nurse give Koontz his blood sample, but he then took Koontz back to the jail. He did not suggest any alternatives, call other hospitals, or offer any other assistance. Also, there is nothing in the record to show that Koontz did not have enough money for another attempt, that the officer was pressed for time or otherwise prevented from trying again, that another attempt would be too long delayed, or that the other hospitals were too far away or similarly unavailable. In this case, Deputy Williams helped create the problem that he then failed to help solve. Accordingly, he failed to reasonably accommodate Koontz's request for an independent test. If Williams had told Koontz he could store and test his blood sample later, this might alter our conclusion. But it would require some evidence, possibly in the form of expert testimony, about the circumstances under which a blood sample can be stored and tested later.

283 Ga App 284 State v Howard A06A2365

Howard requested an independent test but did not have sufficient cash on hand to pay for the test. Howard then requested that a relative be allowed to go to the facility to pay for the test in advance. The officer denied Howard's request citing safety concerns. The court ruled that Howard was not allowed even to attempt to obtain the needed funds, nor did the officer provide any assistance other than offering to go by an ATM. As the trial court pointed out, where security is of concern, relatives could have been asked to come to a secure location, such as the jail, in order to provide Howard with the necessary funds. No evidence indicated that such arrangements would have caused extended delays, nor that the police officer lacked time or resources to make such an accommodation. Vague security concerns, unsupported by any specific evidence, do not provide sufficient grounds to deny an accused's request for an independent test by personnel of his own choosing. "While it is not the officer's duty to insure the performance of an independent test, he cannot prevent a defendant from exercising his right to such a test." The officer rebuffed every suggestion made by Howard and his response was not a "reasonable effort to accommodate" Howard's request for an independent blood test. This had the effect of denying Howard his right to such a test under OCGA 40-6-392.

PROCEDURAL ISSUES

266 Ga App 595 State v. Palmaka

Clarifies the qualifications for an admissible breath test according to GBI rules. Emphasizes that "administrative, procedural, and/or clerical steps performed in conducting a test shall not constitute a part of the approved method of analysis." This removes procedural objections to admissibility of breath tests as any test conducted on an Intox. 5000 that has been inspected periodically and performed by an individual with a valid permit meets the statutory requirement for an approved test. (see State v Padidham A11A0678)

255 Ga. App. 305 Jarriel v. State,

The three hour requirement stated in O.C.G.A. 40-6-391(a)(5) (per se DUI alcohol) may be proved by circumstantial evidence.

281 Ga App 252 Simmons v State A06A1517

This DUI by golf cart defines vehicle in relation to the DUI statute. The court pointed out that 40-6-391 refers to moving vehicles, not motor vehicles," and is not limited to vehicles which are self-propelled. A "vehicle" is defined in OCGA § 40-1-1 (75) to mean "every device in, upon, or by which any person or property is or may be transported or drawn upon a highway, excepting devices used exclusively upon stationary rails or tracks." In addition the court reiterated the DUI statute "draws no distinction between driving on public roads versus private thoroughfares"; further, the fact that the act was committed on private property does not give immunity from prosecution for this crime.

286 Ga App 441 Trull v State A07A1294

Alco-sensor results are not used as evidence of the amount of alcohol or drug in a person's blood. Instead, the alco-sensor is used as an initial screening device to aid the police officer in determining probable cause to arrest a motorist suspected of driving under the influence of alcohol.

2008 Ga App Lexis 1094 Laseter v State A08A1245

We have consistently held...that results of Intoxilyzer breath tests comply with the standard for admissibility as scientifically reliable evidence. And as the Supreme Court observed in Lattarulo, "no procedure is infallible. An accused may always introduce the evidence of the possibility of error or circumstances that might have caused the machine to malfunction. Such evidence would relate to the weight rather than the admissibility of breathalyzer results."

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DRY GAS ETHANOL STANDARD FAQS

Evidential breath tests performed on an Intoxilyzer 9000 utilize a dry gas ethanol standard that is analyzed after the first subject sample to ensure that the instrument is in proper operation. To ensure proper adherence to quality control practices, GBI-DOFS asks that only dry gas standards approved by GBI-DOFS be utilized for evidential breath testing. Failure to utilize the dry gas ethanol standards recommended by GBI-DOFS may result in a failure of the quarterly inspection performed in accordance with O.C.G.A.40-6-392 and GBI Rule 92-3. Vendors approved for supplying dry gas ethanol standards as described above are:

CMI Inc. – 67L tanks with certified target values of 0.080 g/210L (+/-0.002) or better.

ILMO Specialty Gases. – 67L tanks with certified target values of 0.080 g/210L (+/- 0.002) or better.

Other vendors may be approved as suppliers of dry gas standards if they meet the quality control criteria of GBI-DOFS. An official list of approved dry gas ethanol standard vendors can be found in GBI-DOFS procedure OP-SIC 05.

Answers to other frequently asked questions regarding dry gas ethanol standards is as follows:

- 67L dry gas tanks should last for approximately 100 tests.
- Price per cylinder is available from the manufacturer
- Shelf storage life is approximately 2-years
- The actual target value of the tank varies very slightly with atmospheric pressure, but the instrument corrects/ compensates the reading for changes in pressure at the testing site. Thus the corrected target value will always be 0.080.
- It is not recommended that dry gas standard tanks be stored at extremely low temperatures. In an abundance of caution it is advisable to ensure that gas standards are not used or stored for prolonged periods of time below 50 degrees F.
- The dry gas tanks you purchase are considered hazardous materials for shipping purposes because the contents of the cylinders are pressurized. Each state has its own regulations about the disposal of these aluminum cylinders. In all cases, the tanks must be empty prior to disposal.
- For contacts and other tank disposal information about various state offices, refer to the following web link:

  http://www.epa.gov/epawaste/wyl/stateprograms.htm
- When working with any chemical there are inherent health and safety risks involved. All individuals working with dry gas ethanol standards should familiarize themselves with the Material Safety Data Sheets (MSDS) supplied by the vendor prior to handling or utilizing tanks.
- Information for ILMO products can be found at the site below by clicking on the MSDS Online link.

  http://www.ilmoproducts.com/resources/