

<b>ALEXANDER DEJARNETTE,</b>	*	<b>IN THE</b>
<b>Petitioner</b>	*	<b>COURT OF APPEALS</b>
<b>v.</b>	*	<b>OF MARYLAND</b>
<b>STATE OF MARYLAND,</b>	*	<b>No. COA-PET-0218-2021</b>
<b>Respondent</b>	*	

**AMICUS CURIAE BRIEF IN SUPPORT OF PETITION FOR WRIT OF  
CERTIORARI**

Amici curiae, the National College for DUI Defense and the Maryland Criminal Defense Attorneys' Association (Amici) respectfully request this Court grant Dejarnette's Petition for a Writ of Certiorari, because this case presents an issue of great importance in drunk driving cases. Amici have obtained written consent to file this brief from all parties in this case. Amici contend that the Court of Special Appeals erred by holding that failure of police to adequately observe a defendant for 20 minutes preceding the administration of a breath test for alcohol is normally a matter of weight rather than admissibility, and ask this Court to correct it.

**Introduction**

Amici are filing this brief to share with this Court information regarding the scientific basis for the 20-minute observation requirement before conducting an alcohol breath test, as well as the manufacturer's requirements, and methods used in other states to assure accuracy and reliability of breath tests to avoid the danger that alcohol in the mouth can contaminate the breath sample and cause a false high reading.

## **I. The scientific basis for breath testing**

Breath testing for alcohol in blood has been with us since the 1930's. As technology has advanced, the methods for measuring breath alcohol have become more sophisticated, but the biological principles underlying the science of breath testing have remained the same. Among the many different scientific principles and requirements in breath testing, the 2100:1 ratio is pertinent here. Although the range of actual ratios is much larger and varies with individuals and times, breath testing devices employ the 2100:1 blood to breath ratio, meaning the breath alcohol sample contains 1/2100 of the alcohol contained in the blood. Kurt M. Dubowski, *Absorption, Distribution and Elimination of Alcohol: Highway Safety Aspects*, 10 J. Stud. Alcohol Suppl. 98, 102 (1985); Stamm, Leonard R., *Maryland DUI Law, 2020-21 Edition*, at 307 (Thomson Reuters 2020). Although state legislatures have defined drunk driving as having a specified level of alcohol in the *breath* to eliminate defenses based on the 2100:1 ratio, the recorded result is still correlated to the amount of alcohol that is in the blood: grams of alcohol per 210 liters of breath. As the offense, and application of statutory inferences under Cts. & Jud. Proc., § 10-307, is defined by the amount of alcohol in the *breath*, the need to ensure the result is accurate and reliable, and the sample free from contamination, is heightened, and the burden of proving accuracy and reliability should rest solely with the State.

## **II. The multiplication calculation required in every breath test**

The computer in every breath testing device performs a complex calculation to reach a result. As noted, breath testing relies upon a 2100:1 ratio of the alcohol content in the breath to the alcohol content in the blood. The breath value is multiplied by 2100 to give

a reported result at a level that corresponds with the alcohol level in the blood. The final result is expressed in grams per 210 liters of breath. While the subject is required to produce 1.5 liters of breath to satisfy the Intox EC/IR II, the sample chamber is smaller than that and much smaller than the 210 liters of breath used as the base of the measurement. The result must be multiplied exponentially to achieve the alcohol figure for grams per 210 liters of breath.

### **III. The danger of contamination of the sample by “mouth alcohol” and methods of ensuring reliability and accuracy.**

In order to assure the accuracy and reliability of the result, given the exponential multiplication that occurs, it is critical that there be no interference with or contamination of the deep lung air sample. If there is alcohol in the mouth, called mouth alcohol, the sample could be contaminated and a false high reading reported. For drivers who have recently consumed alcohol or mouthwash, if there is still alcohol in their mouths or stomachs, and if the stomach alcohol gets into the mouth through a belch, regurgitation, or gastro-esophageal reflux disease (GERD), it could cause a false high result.

Contamination of a delivered breath specimen can result from residual alcoholic beverage in the mouth, by the presence of residual vomitus containing alcohol in the mouth, by the regurgitation of stomach contents, or by eructation of gas having a significant component of alcohol.

Morton F. Mason & Kurt M. Dubowski, *Breath as a Specimen for Analysis for Ethanol and Other Low-Molecular-Weight Alcohols*, Medical-Legal Aspects of Alcohol 177, 180

(James C. Garriott ed., 4th ed. 2003). "Eructation" is defined as "an instance of belching."  
Merriam-Webster's Collegiate Dictionary, (11<sup>th</sup> ed. 2004).

Alcohol in the oral cavity arising from recent alcohol ingestion, regurgitation of stomach contents containing alcohol or by eructation of gas containing sufficient amounts of alcohol can contaminate the breath sample and cause falsely elevated results.

Patrick Harding, *Methods for Breath Analysis*, Medical-Legal Aspects of Alcohol 185, 186  
(James C. Garriott ed., 4th ed. 2003).

The pioneer work by Bogen indicated that hiccuping, burping, and belching might present a problem in connection with breath-alcohol analysis. Only very limited investigations of this problem have been made, but these indicate that the risk of elevating breath-alcohol readings is greatest shortly after the end of drinking as might be expected because the concentration of alcohol in the stomach is then at its highest.

Alan Wayne Jones & Barry K. Logan, *DUI Defenses*, Drug Abuse Handbook 1006, 1024  
(Steven B. Karch ed., 1988). Observation may not be enough, where the subject suffers from gastro-esophageal reflux disease, also called acid-reflux, GERD, or GERD's cousin, laryngo-esophageal reflux.

It was reported that approximately 7% of US adults experience daily heartburn so GERD probably represents a common disorder, even among those who might submit to a breath-alcohol test. About 90 min after the end of drinking, when the BAC-profile enters the post-absorptive phase, the concentration of alcohol in the stomach should be roughly the same as that in the peripheral venous blood. Accordingly, if gastric reflux occurred 90 min or more after the end of drinking it should not compromise the results of an evidential breath-alcohol test because the concentration of alcohol in the gastric fluid at this time is relatively low and probably similar to that of mucous secretions in the mouth and upper-airway.

Stergios Kechagias, Kjell-Ake Jonsson, Thomas Franzen, Lars Andersson & Alan Wayne Jones, *Reliability of Breath-Alcohol Analysis in Individuals with Gastroesophageal Reflux Disease*, 44 (4) J Forensic Sci. 814, 814 (Jul. 1999). Of course, this quote implies that the converse may be true. If the gastric reflux occurs during absorption, which according to studies by Dr. Dubowski, can take over 2 ½ hours, then it could affect the breath reading.

Obviously, the risk of gastric reflux increasing the result of a breath-alcohol test will be greatest shortly after the end of drinking when the concentration of alcohol in the stomach is at its highest. [T]he mandatory 15 min observation period still remains an important element of the evidential breath-alcohol test protocol because this can help to rebut allegations that gastric reflux occurred.

*Id.* at 818.

A number of tools can be used to minimize the risk of mouth alcohol causing a false high reading. Two tests can be run a predetermined time apart, the devices can have mouth alcohol detection software, and officers can check the suspect's mouth for foreign substances and to observe the suspect to ensure that they restart the observation period if there is a belch or regurgitation. All three of these checks are critical to producing a more accurate and reliable breath test, as systems for detecting mouth alcohol are far from foolproof. According to one author who was a director of the breath testing program in Wisconsin:

Our experience with the Intoxilyzer 5000 has shown that its residual mouth alcohol flagging program (that is, the slope detector) is not entirely reliable under the extreme experimental conditions employed in the present study. In this experiment we were able to obtain apparent BrACs as high as 0.18 g/210 L in spite of this feature. The slope detector was never intended to be a substitute for residual mouth alcohol detection and prevention protocols such

as a pretest alcohol deprivation period and requiring agreement within 0.02 g/210 L for successive BrACs taken 2 to 10 min apart.

Patrick Harding, et. al., *The Effect of Dentures and Denture Adhesives on Mouth Alcohol Retention*, 37 Journal of Forensic Science 999, 1006 (July 1992).

The breath test experts agree that, in addition to other requirements and safeguards, pre-test observation is an independent and indispensable component of a valid breath test for alcohol.

#### **IV. Differences among the states compared with Maryland**

Each state, through legislative, administrative or judicial means, has adopted procedures to approve, purchase, and maintain equipment and institute operational requirements for a valid breath test. In Maryland, the toxicologist under the Post-Mortem Examiner's Commission, as required by Cts. & Jud. Proc., § 10-304(b), has approved the Intox EC/IR II. This device is made by Intoximeters, Inc. in St. Louis, Missouri and is the second generation of its electrochemical (EC) and infrared (IR) testing device. The EC refers to the process by which a fuel cell reacting to alcohol in the sample creates an electrical current in proportion to the amount of alcohol in the sample. The Intox EC/IR II uses infrared testing to measure changes in an infrared signal as alcohol passes through the chamber, not to quantify an alcohol level, but to determine when during the breath the EC snapshot should be taken.<sup>1</sup>

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<sup>1</sup> The Intox EC/IR II is also used in Wisconsin, Illinois, Arkansas, West Virginia, Tennessee, Wyoming, portions of California, Virginia and North Carolina. Other states use infrared testing, electrochemical testing or a combination of both in the Intoxilyzer, the Datamaster, or the Draeger devices.

Different states have taken differing approaches to the problem of ensuring that the breath sample is not contaminated. Some states, including Maryland, require a 20-minute observation period, while others require a 15-minute period. *Compare* ARK. ADMIN RULES 007.25.12-001 § 3.40 (2013) and *Clawson v. State*, 867 A.2d 187 (Del. 2005) (20 minutes) *with* CAL. CODE REGS. tit. 17, § 1221.1 (2017) and CONN. AGENCIES REGS. § 14-227a-10b(c)(1)(A)(2005)(15 minutes). Some states, including Maryland, allow officers to record the beginning of the observation period as the time of arrest, while others have programmed their equipment to require that the accused and officer be seated in front of the breath test device for the entire observation period. In practice and by regulation, Maryland allows arresting officers untrained in administering a breath test to observe the suspect, while other states require the subject be observed by an officer specially trained to administer the test. *Compare* COMAR 10.35.02.08 (G)(3) *with* 5 Colo. Code Regs. § 1005-2:4.

In Maryland, breath testing is conducted by a police officer or properly trained civilian working for a police agency. These individuals are referred to as breath test operators. The arresting officer is disqualified from testing by statute. Cts. & Jud. Proc. § 10-304(b)(2). All operators must go through a training conducted by the Maryland State Police that consists of a minimum of 35 hours of lecture or laboratory instruction. The operators must update their training periodically. The training consists of blocks of theoretical and practical learning. Specifically during this training, the operator is taught what a 20-minute observation period consists of, what to look for, and the significance of

the 20-minute observation period. *See generally*, COMAR 10.35.02.05. *Evidentiary Tests of Breath for Alcohol: Testing Agencies and Training Programs*.

The 20-minute observation period is discussed in the materials provided during the operator's training. The training manual for all technicians combines materials from Intoximeters and material specific to the Maryland breath testing program.<sup>2</sup> There are several sections of the training materials that address the issue, purpose, and significance of the 20-minute observation period. Specifically, in the section of the manual entitled "Limitations of Breath Testing," the operators/technicians are taught the importance of concentrating on the following issues:

1. Quality to breath sample testing;
2. Any materials in the mouth of subject or possibility of regurgitation;
3. Observation of subject.

Chemical Test for Alcohol Unit, *Safer Roads Through Vigilant Testing* at 126 (2015 Maryland Department of State Police).

Furthermore, new operators are educated on the factors influencing breath testing.

They are specifically taught about mouth alcohol:

It is necessary to wait a minimum time after the consumption of an alcoholic beverage before breath testing. This is done in order to prevent contamination of the breath sample by any alcohol remaining in the mouth. Traces of alcohol remaining in the mouth from a recent drink or regurgitation are stated to disappear in 5-10 minutes.

When individuals behave normally (i.e. breathing through mouth occasionally and talking) mouth alcohol dissipates in 5-10 minutes. Mouth

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<sup>2</sup> Each state has its own regulations and training materials.

alcohol may be prolonged by 5 minutes by keeping the mouth closed and not talking.

Most mouthwashes contain alcohol and recent use of a mouthwash could interfere with a breath analysis in the same way as could a recent drink. The operator must be alert to any possibility of mouth alcohol contamination.

*Id.* at 126-27.

The Maryland Testing Manual reads in pertinent part:

**Maryland Regulations require a 20 minute observation period be conducted before any testing procedures begin.**

During this observation period the individual may not ingest anything by mouth (regurgitation, vomiting, etc.)

The observation of the individual can be performed by:

1. A breath test operator;
2. Other uniform or civilian law enforcement personnel;
3. Any combination of a breath test operator and uniformed or civilian law enforcement personnel.<sup>3</sup>

When mouth alcohol is detected by the instrument, the operator should re-check the mouth then wait an additional 20 minutes prior to administering any subsequent breath testing.

*Id.* at 127.

By way of contrast, the Virginia *Intox EC/IR II Breath Test Operator Instructional Manual* (Virginia Department of Forensic Science, July 7, 2008),

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<sup>3</sup> This language is copied almost verbatim from COMAR 10.35.02.08 (G)(3).

which instruct operators regarding the same equipment,<sup>4</sup> states:

### **MOUTH ALCOHOL AND BREATH TESTING**

Residual mouth alcohol must be considered when conducting a breath test. After drinking an alcoholic beverage, some alcohol (liquid or vapor) is temporarily retained in the mucous lining (the moist secreting tissues) of the mouth and the nasal passages. This is known as residual mouth alcohol. When deep lung air is exhaled, the vapor from any residual alcohol could be picked up by the deep lung air as it passes out of the mouth. Under these circumstances, mouth alcohol can cause a potentially greater concentration of alcohol in the breath sample, which in turn can cause a falsely higher BAC reading.

The effect of residual mouth alcohol is dependent upon: (1) the concentration of alcohol originally in the mouth, (2) the time the alcohol stayed in the mouth, and (3) the time elapsed since the alcohol was in the mouth. Experiments have shown that residual mouth alcohol will be eliminated by normal body processes well within 20 minutes. For this reason, the subject must be observed for 20 minutes prior to providing a breath sample.

Residual mouth alcohol contamination of a breath sample could occur in several ways other than from drinking an alcoholic beverage. First, the subject, who has alcohol in his/her stomach, could vomit and thus bring alcohol bearing solids and liquid into the mouth cavity, producing residual alcohol. Second, a subject, who has alcohol in his/her stomach, could belch, bringing alcoholic vapor into the mouth.

Rinsing the mouth with water is not effective in eliminating mouth alcohol. When a drinking-driving subject has recently taken a drink, vomited,

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<sup>4</sup> There is variability among the specific state programs with respect to the equipment selected, and even states purchasing the same model may choose different specifications for the instruments obtained, such whether to require single or duplicate testing, the length of time between tests in a duplicate testing state, whether or how to guard against radio frequency interference, whether to use mouth alcohol detection software, whether the subject is to be seated in front of the machine when the test sequence including the observation is started, whether the person doing the observation must be a trained breath test operator, and other specifications.

belched, or otherwise come in contact with alcohol, another 20-minute observation must be performed for the effects of any residual mouth alcohol to dissipate before a valid breath sample can be taken.

On occasion, a subject may have used a mouthwash in an attempt to mask the odor of an alcoholic beverage. Many mouthwashes have a significant alcohol concentration (up to 20% by volume) and should be regarded in the same manner as an alcoholic beverage. The breath test operator should be alert to the possibility of residual mouth alcohol contamination when he/she detects the characteristic odor or a mouthwash or sees the subject attempting to use a mouthwash. The foregoing also applies to cough medicines that contact alcohol. Another source of residual mouth alcohol could be an alcohol-saturated cotton wad used to relieve dental pain. The operator should always inspect the subject's mouth for any foreign objects. If found, they should be removed, and the subject must be observed for 20 minutes prior to providing a breath sample.

The Department of Forensic Science operator and instrument protocols, along with the Intox EC/IR II have several safeguards in place to prevent an inaccurate analysis and to ensure a valid test.

Visual inspection of the mouth: Inspecting the mouth prior to conducting the observation period ensures that no foreign object(s) are within the mouth. If found, the foreign object(s) should be removed and a 20 minute observation period observed. As a note, based on the results of published, peer reviewed articles and DFS laboratory experimentation, the Department of Forensic Science does not require a subject to remove dental appliances or mouth piercings because of the lack of effect on breath alcohol results.

A minimum 20 minute observation period. Experiments have shown that residual mouth alcohol will be eliminated by normal body processes well within 20 minutes. As a reminder, the operator should also ensure the subject has not belched, burped, or regurgitated during the observation time. An additional 20 minute minimum observation period should be

observed if the subject does belch, etc. during the observation period. Comments can be noted on the operator worksheet.

*Id.* at 21-22.

The only individuals in Maryland who receive training on the EC/IR II operation, theory, alcohol and scientific principles, ethanol pharmacology and toxicology, and factors influencing breath testing are breath test operators. COMAR 10.35.02.06. Only operators know and are trained what to observe in order to avoid mouth alcohol. A simple burp or belch, no matter how small, can create mouth alcohol, if the person has alcohol in their stomach. This mouth alcohol, when added to the sample of breath originating in the lungs, can create a false high result. A patrol or uniform officer does not receive this specific and advanced training and does not know what to look for in order to maintain integrity in the breath testing procedure. Burping and belching can be a silent and subtle process; close observation and training is required in order to avoid sample contamination.

Other states, such as Colorado, allow only trained operators to conduct the observation period before testing at the location of the instrument. Colorado's regulations provide:

*4.2.3 Completion of a 20-minute deprivation period must be conducted at the approved EBAT facility by a certified EBAT instructor or operator that is in an active status that must include;*

*4.2.3.1 Removal of any foreign material from the subject's mouth cavity that is not permanent in nature, prior to starting the 20-minute deprivation period, and*

*4.2.3.2 Depriving the subject access to foreign material that may be introduced into the mouth cavity during the 20-minute deprivation period, and*

*4.2.3.3 Observing the subject for signs of belching, regurgitation, or intake of any foreign material into the mouth cavity during the 20-minute deprivation period. If such observations occur, the 20-minute deprivation period must be repeated under the same conditions prior to testing.*

5 Colo. Code Regs. § 1005-2:4. (Emphasis added).

Similarly, in *Clawson v. State*, 867 A.2d 187 (Del. 2005), the Delaware Supreme Court adopted a bright-line 20-minute observation period as an evidentiary foundation to the admissibility of breath test results:

We hold that in order for the result of the intoxilyzer test to be admitted, the State must law an adequate evidentiary foundation showing that there was an uninterrupted twenty minute observation of the defendant prior to testing. We further hold that testing commences when the officer inserts the intoxilyzer card into the machine. This is not a burdensome requirement given the purpose behind the twenty minute observation period and the significant consequence of admitting a test result into evidence. When the Intoxilyzer 5000 was determined to be scientifically acceptable in determining blood alcohol content, part of the process for making the test results reliable was compliance with the manufacturer's protocol for the twenty minute observation period. The purpose of this requirement is to eliminate the effect of residual alcohol or other contaminants within the mouth cavity that could affect the reliability of the test's results.

*Clawson*, 867 A.2d at 192.

Regardless of the precise requirements for each state, all experts, states, and manufacturers agree that observation is a critical requirement for a valid breath test. Other states have more stringent protocols for guarding against mouth alcohol than Maryland's more forgiving program. While Maryland's 20-minute observation requirement is admittedly more stringent than the states that only require 15 minutes, Maryland allows untrained officers to conduct the observation, and does not require the observation be in front of the machine. Maryland does not expressly prohibit observation while driving,

administering field tests, or doing paperwork as was done by case law in Tennessee and regulation in Colorado. *E.g.*, *State v. Korsakov*, 34 S.W.3d 534 (Tenn. Crim. App. 2000); *State v. McCaslin*, 894 S.W.2d 310 (Tenn. Crim. App. 1994); 5 Colo. Code Regs. § 1005-2:4.

Placing the burden on the defendant of proving a violation, in order to exclude the test, is not a fair way to guard against inaccurate or unreliable tests being entered in evidence. Where the issue arises, the court has already determined, if contested, that there is probable cause to believe the defendant is impaired. In DUI cases, courts can and frequently will discount a defendant's credibility. Additionally, with the increasing prevalence of body cameras, there is no reason why the entire observation period cannot be captured on video for either side to use.

Given the more forgiving approach to observation followed in Maryland, and recognizing that the admission of the result in evidence is almost always outcome determinative, Amici maintain that strict adherence to the 20-minute observational requirement, and making it a pre-requisite for admitting breath results in evidence, is the only way to assure that the test results entered in evidence are sufficiently accurate and reliable.

### **Conclusion**

For the reasons stated, Amici request this Court grant Dejarnette's Petition for a Writ of Certiorari.

Respectfully submitted,

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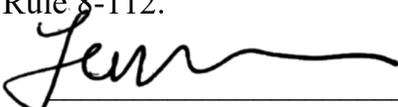
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## Certification of Word Count and Compliance with Rule 8-112

1. This brief contains 3878 words, excluding the parts of the brief exempted from the word count by Rule 8-503.

2. This brief is in Times New Roman font, size 13, and complies with the font, spacing, and type size requirements stated in Rule 8-112.



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## Certificate of Service

I HEREBY CERTIFY that on this 7 day of September, 2021, copies of the foregoing Brief of Amicus Curiae were delivered via MDEC to:

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