

# Law & Science

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## **Justice Delayed is Justice Denied: Due Process Violations in SCRAM Cases**

***Patrick T. Barone, J.D., Michael P. Hlastala, Ph.D.***

Over the last twenty years societal and political pressures have turned the cause of eliminating drunk driving into the Nation's new prohibition. During this time the courts have struggled with ways to reliably monitor a drunken driving offender's pre-conviction and post-conviction use of alcohol. For this purpose, the courts are now employing a newer product known by the trade-name "SCRAM", an acronym meaning "secure continuous remote alcohol monitor".

The SCRAM device, manufactured by AMS, is a bracelet worn on the offender's ankle. AMS claims that it monitors the use of alcohol as it migrates through the offender's skin. The scientific underpinnings of SCRAM are discussed in more detail below.

While in place the bracelet takes alcohol readings once per hour. If alcohol is detected, the readings are taken twice per hour. The readings are then reported via a modem and the internet to a remote server located outside AMS' home office. The information is then plotted into a graph, which is reviewed by AMS to determine if a possible drinking episode can be "confirmed".

Before an event is confirmed as a consumption event, the manufacturer will submit any positive test results for alcohol to an internal review process. AMS contends that they impose strict, well-defined, and very conservative guidelines for this confirmation process. In addition, for any event to be a "confirmed event", it has to hold up to review by an internal, highly trained committee, and all parties must concur before the event is confirmed. One may conjecture that this arduous confirmation process is necessary in part because of distortions in the typical alcohol metabolism curve. These distortions complicate the interpretation of TAC (transdermal alco-

hol content) curves. This problem is discussed in more detail below.

Once a drinking episode is confirmed the manufacturer will report this confirmation back to the local monitoring agency, which is usually the court where the offender's case is pending. The court will then employ its own follow-up procedures that depend on the status of the case. If the offender is on bond, he or she may face a bond revocation hearing, while if the allegation of alcohol use occurs post-conviction, the offender may be facing a possible show cause hearing that could result in a revocation of probation.

Upon an adverse finding in court for either violation there is always the persistent and very real possibility that significant punitive sanctions will be imposed by the court. Depending on the circumstances, these sanctions might include a potentially lengthy incarceration. Consequently, in these instances certain due process protections ought to apply to the offender, including the essential due process rights of timely notice and the opportunity to be heard. However, in practice, these rights are difficult to protect because the "confirmation" process is not immediate, and then even after the drinking episode is ostensibly "confirmed" by AMS there is an additional delay, which is often as much as several weeks, between the time of the suspected drinking episode and the time the offender is notified of this allegation.

Due to these delays, the ability to collect a potentially exculpatory independent breath or blood test has long since passed by the time the offender receives notice of the allegation. Thus, the offender will find him or herself in the unenviable position of having to prove a negative, that is, that he or she was not drinking, and must do so without any ability to produce convincing evidence to support the denial.

Any attempt to prove the negative will be further frustrated by the lack of information available to the defense relative to the inner workings of the device. This lack of information is based in part on the proprietary nature of the device that understandably, the manufacturer wishes to keep confidential. These two factors, however, coalesce to create significant Constitutional problems for the accused. To fully comprehend these problems it is important for practitioners to first have a comprehensive understanding of what is known

about the science that underlies the SCRAM bracelet.

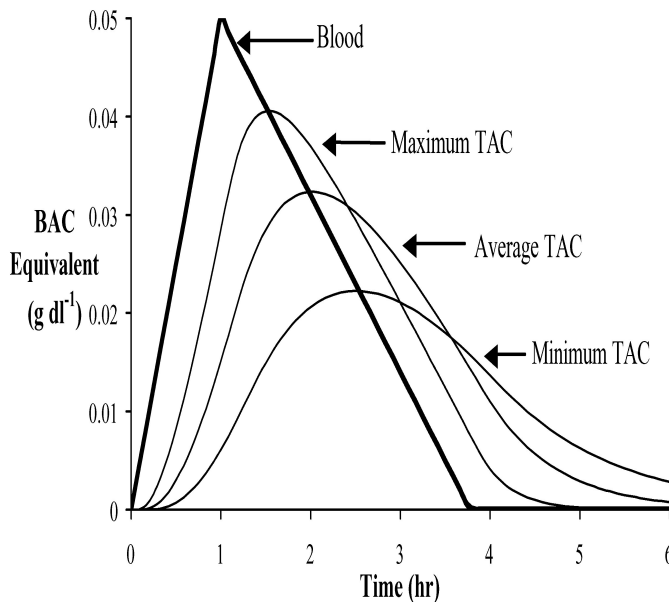
### **The Science of Transdermal Alcohol Monitoring**

The SCRAM device works by measuring the gas alcohol concentration over the skin. Alcohol is delivered to the skin via blood flow. Alcohol then diffuses through the perfused tissue layer, the epidermis and the *stratum corneum* and then into the gas above the skin<sup>1</sup>. The *stratum corneum* is made up of densely packed cells and represents the major barrier to alcohol diffusion. Thus the diffusion process is a "diffusion-limited" (depends on the resistance to diffusion) system which varies considerably depending on the physiological (or pathological) properties of the skin.

In addition to passive diffusion, detectable perspiration contributes a conductive component to the process. In the case of perspiration, alcohol dissolved in sweat contained in the sweat glands is carried to the surface by the convective liquid movement to the surface. Under normal circumstances, perspiration represents only a small component of the transdermal skin flux. However, under conditions of exercise (increase in body heat) or hyperthermia, the increase in sweat production to help in body cooling will enhance the rate of transdermal alcohol exchange.

The diffusive alcohol exchange occurs due to a net movement from a region with high concentration to a region with a lower concentration. When the blood alcohol concentration (BAC) is higher than that at the surface of the skin, there is a net alcohol flux from the blood to the gas above the skin. During the alcohol absorption phase, when the BAC is increasing, alcohol diffuses from the blood toward the skin surface.

During the elimination (burn-off) phase, the opposite occurs as alcohol diffuses from the gas above the skin toward the blood. Because the exchange is diffusion-limited in both directions, the shape of the transdermal alcohol concentration (TAC as denoted by AMS) curve is distorted relative to the shape of the BAC curve. The TAC curve is generally flatter (decreased peak height) and the rates of increase and decrease of TAC are reduced relative to the same values for the BAC curve (Anderson & Hlastala). This curve distortion complicates the interpretation of TAC curves.



**Figure 1 illustrates the distortion of the TAC curve relative to a hypothetical BAC curve given the inter-individual variation in skin diffusion properties.**

Generally, the process of authenticating an alleged drinking episode requires two important assumptions. First, that the height of the TAC curve is directly related to the BAC curve and is determined by adjusting with a fixed correction factor. The practice of converting TAC curve by a constant multiplier assumes that the shape of the TAC curve is identical in form to the BAC curve. This assumption is flawed because the shapes are quite different (as shown in Figure 1). If the subject has an average TAC curve, then correction by a constant factor would be appropriate. However, if the subject has a near maximum TAC curve, then the peak BAC would be overestimated using an average correction factor. Similarly, if the subject has a near minimum TAC curve, then the peak BAC would be underestimated using the average correction factor.

Second, that the rate of TAC decline is equal (or at least similar) to the rate of BAC decline (burn-off rate). Under normal circumstances neither of these assumptions can be true due to the variations in skin diffusion properties among the normal population, thus leading to false positives (apparent readings of supradermal gas alcohol concentration above 0.02 gm/dl when the BAC is actually lower than 0.02 gm/dl). The impact of

errors in these assumptions have not yet been adequately evaluated. Because of the normal physiological variation in skin diffusion properties, the SCRAM device can yield either false positives or false negatives.

The method used by AMS to determine whether an alleged drinking event is a “Confirmed Drinking Event” is subjective at best. A data string showing the alleged event is reviewed by employees of AMS. The criteria used for determining whether the data truly indicates a drinking event is unclear and not specifically defined. This determination ostensibly relates to the examination of the TAC rate of decline with the assumption that this rate directly correlates with the BAC burn-off rate. However, the ability to make this determination depends critically on the assumption that diffusion properties of the specific subject’s ankle skin are the same as an average ankle.

If AMS were to develop a set of specific criteria for judging an alleged drinking event, it would make the determination “objective” rather than “subjective,” legitimizing the interpretation and minimizing the possibility of false-positive determinations of drinking events. Such an approach would also speed up notification to the subject when a positive drinking event is identified so that he or she can obtain exculpatory data.

Another concern relates to the resolution of determination of the “burn-off” rate of the TAC curve. The data points are obtained every 30 minutes (rather than continuously). In the presence of measurement or random noise, it becomes difficult to accurately measure the rate of decline of the TAC curve. A systematic analysis of the effects of measurement noise (error) has not yet been published.

### **How the Typical SCRAM Case Causes Science and Law to Collide**

Aside from the apparent reliability problems discussed above, the very processes involved in the monitoring and confirmation of a drinking episode by the manufacturer requires a significant delay between the “confirmation” of a drinking episode and the actual notification of this “confirmation” to the offender. This systematic problem with SCRAM is exacerbated by the physiological delay in the expression of the alcohol through the skin. Scientific literature has shown

that this delay might be as much as 120 minutes<sup>2</sup>, while the manufacturer claims that this delay might be as much as 180 minutes<sup>3</sup>.

A third source of delay may be termed “judicial” delay, which is the delay that occurs between the notification of a Confirmed Event by the manufacturer and the subsequent notice to the offender by the monitoring agency. These delays create an almost certain violation of the offender’s constitutional rights because they effectively preclude the offender from any opportunity to seek and obtain potentially exculpatory evidence in the form of an independent test. Independent testing is particularly crucial where, as here, recent scientific research suggests that the data and processes used to “confirm” drinking are respectively both unreliable and subjective<sup>4</sup>.

A review of the applicable case law suggests that while this specific issue has not been addressed at the Federal level, Federal courts have resolved the more general right to obtain exculpatory evidence in favor of the accused<sup>5</sup>. On the other hand, the right to independent testing, or at least to be protected from active interference with this right, is protected by many state courts. For example, in Michigan, once a drunk driving accused has submitted to the chemical test of the police officer’s choosing, he or she has the right to collect an independent test. If this right is interfered with it may result in a dismissal of the drunken driving case<sup>6</sup>. Many other state appellate courts have rendered analogous rulings<sup>7</sup>.

Under federal law, the United States Supreme Court and the Circuit Courts have provided ample and consistent legal authority for the proposition that an accused is entitled to obtain exculpatory evidence<sup>8</sup>. This right has been explained as follows: “[d]efendants have a due process right to obtain evidence in the possession of the prosecutor if it is favorable to the accused and material to guilt or punishment<sup>9</sup>.”

Additionally, the Sixth Circuit Court of Appeals similarly stated that, pursuant to *Brady*, a prosecutor is required to turn over evidence that is “favorable to the accused and ‘material’ to guilt or innocence.” Plus, when evidence is not turned over, it results in a Constitutional violation<sup>10</sup>. Along this line, the United States Supreme Court has held that suppression by the prosecution of evidence favorable to an accused upon request violates due process where the evidence is material

either to guilt or to punishment<sup>11</sup>.

In the context of transdermal blood alcohol monitoring, the wearer of a SCRAM bracelet should be entitled to obtain an independent breath test or blood test, or both, if AMS indicates that an alcohol incident has occurred. For this type of protection to be meaningful, the SCRAM bracelet must have an audible alert signal that advises the wearer that a claimed “violation” has been detected. Then, an immediate blood draw could either refute the monitoring device’s accuracy or quantify (through GC-MS analysis) what chemical has led to the alert being recorded.

The reason for this is, of course, that the wearer of the SCRAM bracelet would otherwise be subjected *exclusively* to AMS’s alcohol analysis, which, as stated, is currently based on undisclosed *proprietary* evaluation methods, as well as technology that is inherently inferior to breath testing or a blood alcohol screen. Previous scientific research has shown that unlike traditional forms of breath and blood testing, SCRAM readings are not intended as an accurate or reliable quantitative measurement<sup>12</sup>.

Nevertheless, judges and related court personnel may argue that there is no due process right to obtain exculpatory evidence relative to SCRAM bracelet situations because the case law that addresses exculpatory evidence pertains to the adjudication of guilt or innocence, as to a charged offense, whereas, typically, an individual who is required to wear a SCRAM bracelet has already been convicted of an alcohol-related crime, or he or she is simply being monitored for alcohol consumption while awaiting trial or disposition. However, an argument of this nature would actually be at odds with *Brady* and its progeny because often the penalty for consuming alcohol while in a home-monitoring program—where members of AMS would be the sole determiner of whether an alcohol event actually occurred—is incarceration. Therefore, regardless of how judges and court personnel may wish to characterize the matter, the fact remains that an individual may lose his or her liberty based on AMS’s determination—unless the collection of independent evidence is permitted in order to potentially exculpate the accused.

Furthermore, whether existing evidence is suppressed, relative to the discussion in *Agurs*, or whether the accused is prohibited from going out

and obtaining exculpatory evidence, the result is the same – namely, an individual may end up incarcerated for allegedly consuming alcohol while wearing a SCRAM bracelet, when in fact there may have been no alcohol consumption whatsoever.

Consequently, if courts are going to employ the apparently inferior science of transdermal blood alcohol monitoring in connection with pre-conviction and post-conviction procedures, then those procedures must be safeguarded with more reliable technology in order to avoid the specter of an innocent person losing his or her liberty based only on a dubious and non-disclosed analysis from AMS. Indeed, the *Agurs* decision by the United States Supreme Court substantiates this conclusion. While addressing the issue of competing evidence, relative to exonerating an accused, the Court stated the following: “If, for example, one of only two eyewitnesses to a crime had told the prosecutor that the defendant was definitely not its perpetrator and if this statement was not disclosed to the defense, no court would hesitate to reverse a conviction resting on the testimony of the other eyewitness<sup>13</sup>.”

The same is true with a statement from AMS that an individual has consumed alcohol—a court should not hesitate to permit the accused an opportunity to obtain exculpatory evidence, in the form of a more reliable breath test or blood test, in order to prevent an innocent person from being wrongfully incarcerated or subjected to other unwarranted penalties. Thus, if anything, the SCRAM bracelet should be used as merely a preliminary screening device—so long as the wearer is notified of AMS’s determination that an alcohol incident has allegedly occurred, within sufficient time for exculpatory evidence to be obtained.

Presently, however, AMS’s current technology and reporting protocol does not permit timely notification. Accordingly, the use of SCRAM technology, in its current form, is likely to violate an innocent user’s due process rights. As a result, it appears that SCRAM bracelets should not be used for any purpose resulting in any form of penalty until appropriate notification procedures can be implemented. At best, a “positive” SCRAM reading should be merely a “presumptive” violation, and be required to be “confirmed” by an immediate forensic test.

### **Possible Solutions to SCRAM’s Due Process Problems**

In states where SCRAM is being utilized, courts often recommend it as an alternative to incarceration. Consequently, the SCRAM bracelet is often viewed by defense counsel as a pragmatic way to keep his or her client out of jail. While problems with the underlying science are discussed above, and there are many, it can nevertheless be said that the SCRAM bracelet probably works reasonably well at detecting an actual drinking event most of the time.

Thus, because of the possible benefits to the client it may not be necessary to advocate against the use of the SCRAM bracelet altogether. However, it is abundantly clear that the device should never be used for evidentiary purposes to “prove” the use of alcohol. Instead, the device should only be used to require that the wearer appear within a prescribed time for a more accurate alcohol test which would preferably be a blood test. Such a change would relegate the SCRAM bracelet to the position it ought to occupy, that of a simple screening test, or in other words, to the position of the roadside preliminary breath test. This conclusion is further compelling because the technology for both devices is identical, i.e., both use fuel cells to detect the presence of alcohol. They are both “presumptive” testing methods, not “confirmatory”.

Provided the manufacturer can change their procedures and technology so that an offender can assuredly obtain “real time” notification of the alleged “confirmed” alcohol event, the wearer will be reasonably well protected by the ability to obtain an independent test. However, without such immediate notice there is no way to adequately protect the wearer’s Constitutional rights. With such notice and audible alert capabilities, the SCRAM bracelet can become a powerful tool in the court’s quest to monitor probationers on house arrest and effectively stop the offender’s use of alcohol.

1. Joseph C. Anderson and Michael P. Hlastala. *The kinetics of transdermal alcohol exchange*, *J Appl Physiol* 100: 649-655, 2006.
2. Robert M. Swift, Christopher S. Martin, Larry Swette, Anthony LaConti & Nancy

- Kackley, *Studies on a Wearable, Electronic, Transdermal Alcohol Sensor*, 17 *Alcoholism: Clinical and Experimental Research* 4 at 721- 725 (1992).
3. Testimony of Jeffery Hawthorn as provided in Evidentiary Hearing at 86, *People vs. Glaza*, Oakland County Dist. Ct., (Dec. 15, 2004) (04-003877).
  4. Anderson and Hlastala, *supra*.
  5. The linchpin of this proposition is the case *Brady v. Maryland*, 373 U.S. 83; 83 S.Ct. 1194; 10 L. Ed. 215 (1963).
  6. *See*, e.g., *People v Underwood*, 153 Mich App 598; 396 N.W.2d 443 (1986), (*Accord*, *People v. Anstey*, No. 255416, 2005 WL 292237 (Mich.App. Feb. 8, 2005)).
  7. *See Commonwealth v. O'Brien*, 434 Mass. 615, 750 N.E.2d 1000 (2001). (No requirement exists that the police assist a defendant charged with driving while intoxicated (DWI) in obtaining an independent medical examination, but they may not *prevent or hinder* the defendant's reasonable and timely attempt to obtain such an examination, and *State v. Minkoff*, 308 Mont. 248, 42 P.3d 223 (2002) (Upholding a similar rule of "non-impedance" of a person's independent test rights. *See also State v. Dull*, 176 Ga. App. 152, 335 S.E.2d 605 (1985). (Holding that a failure to inform defendant of right to additional, independent chemical test, not failure to obtain and show waiver affirmatively, rendered results of chemical test administered at arresting officer's request inadmissible).
  8. *See Brady v. Maryland*.
  9. *People v. Stanaway*, 446 Mich 643, 666; 521 N.W.2d 557, 569 (1994).
  10. *United States v. Frost*, 125 F. 3d. 346, 382 (6<sup>th</sup> Cir. 1997).
  11. *See United States v. Agurs*, 427 U.S. 97; 96 S.Ct. 2392, 2398 n.10; 49 L.Ed.2d 342 (1976).
  12. Daniel J. Brown, 7 (10) *The Pharmacokinetics of Alcohol Excretion in Human Perspiration*, 7 *Methods and Findings Experimental Clinical Pharmacology* 539 (1985).
  13. *United States v. Agurs* at 2402, n.21.

Patrick T. Barone's firm is headquartered in Birmingham, Michigan. In March of 2006, Mr. Barone was selected by John Tarantino to assume authorship of "Defending Drinking Drivers" (James Publishing) a well-known and highly respected multi-volume national legal treatise on DUI-DWI Law and Practice. He also holds Sustaining Member status in The National College for DUI Defense. His law firm covers all of Michigan and represents only those accused of crimes involving impaired driving as a result of allegedly ingesting too much alcohol or drugs. He can be contacted at [baronedefensefirm@sbcglobal.net](mailto:baronedefensefirm@sbcglobal.net)

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## Case Law at a Glance & Litigation Tips

### **FLORIDA**

**Florida's *Belvin* Ruling Vacated and En Banc New Excellent Ruling Substituted; Virginia Court of Appeals Seals *Luginbyhl's* Fate**

*Belvin v. State*,

922 So.2d 1046 (Fla.App. 4 Dist. 2006).

**Editor's Note:** The full 4<sup>th</sup> Circuit Court of Appeals in Florida withdrew its prior ruling and substituted a much better opinion answering and denying all the State's challenges seeking to allow breath testing affidavits on a variety of