

Reducing Alcohol-Related Crime Electronically

Kirby Phillips

Alcohol Monitoring Systems

ELECTRONIC ALCOHOL monitoring technology as a deterrent to alcohol consumption has been used for several years. However, truly cost-effective and reliable technology that operates as a 24-hour monitor has yet to be realized. This article proposes the implementation of a new technology, which monitors the excretion of ethanol through the skin as a measure of blood alcohol levels. This technology will provide those in community corrections with a reliable and effective means of assisting with the rehabilitation and policing of offenders sentenced to abstain from alcohol consumption.

The impact of alcohol use on our society has been widely researched, and the strong link between criminal behavior—especially violent behavior—and crime has been an issue of public policy concern for decades. Nonetheless, solutions to the disproportionate amount of resources, space, and dollars required for alcohol offenders in our overcrowded criminal justice system are diverse and controversial. According to the National Center on Addiction and Substance Abuse (CASA) at Columbia University, “Releasing drug- and alcohol-abusing and addicted inmates without treating them is tantamount to visiting criminals on society.” In their 1998 report, *Behind Bars: Substance Abuse and America’s Prison Population*, CASA goes on to state that of every dollar spent on substance abuse in state budgets in 1998, 96 cents went to “shoveling up the wreckage” of substance abuse and addiction, while only 4 cents went to actually prevent and treat it (CASA 1998).

In 1996, the American Probation and Parole Association issued a position statement on substance abuse treatment in community

corrections. Based on research revealing that involuntary participation in treatment works approximately as well as voluntary participation (Anglin & Hser, 1990), the APPA states that, “Probation and parole is an effective context for treatment to occur. An integrated approach involving assessment, treatment-offender matching, intervention (i.e., treatment), surveillance (i.e., drug testing), and enforcement (i.e., sanctions) is an appropriate strategy for dealing with drug-involved offenders” (APPA 1996).

According to a 1996 study by the National Highway and Traffic Safety Administration, recidivism rates one year after sentencing of DUI offenders were 33 percent lower for subjects sentenced to a combined program that included home detention and electronic monitoring. Since offenders often fail to comply with all the terms of their sentence, NHTSA recommends investigating the costs and benefits of implementing various mechanisms to increase compliance with sanctions (NHTSA 1996).

The Price of Alcohol Abuse and Recidivism

The number one substance abuse crime in America is drunk driving, accounting for 1.47 million arrests in 1997 at a cost of over \$5 million (Bureau of Justice Statistics 1999). Add to that the fact that as of the year 2000, America broke the \$100 million-dollar-a-day barrier in spending to incarcerate individuals with serious drug and alcohol problems (CASA 1998).

Some additional facts:

- As a whole, according to CASA, alcohol is more closely associated with crimes of violence than any other drug, with 21 per-

cent of state and 26 percent of jail inmates incarcerated for violent crimes under the influence of alcohol alone at the time of their offense (CASA 1998).

- One-third of all DWI offenders on probation and two-thirds in jail are repeat offenders. Over half of DWI offenders in jail were on probation, parole, or pretrial release at the time of their new offense.
- In terms of parole and probation violations, 50 percent of state parole and probation violators were under the influence of drugs, alcohol, or both when they committed their new offense (Bureau of Justice Statistics 1999).

The bottom line? Only a fraction of offenders who were alcohol abusers at the time of their offense, regardless of the offense, are ever actually sentenced to abstain from alcohol. On average, there are over 1.4 million DWI arrests annually, resulting in 513,200 DWI convictions. And while 33 percent of those convicted and sentenced to probation are repeat offenders, only 10 percent of them are actually ordered to abstain during the term of their probation (Bureau of Justice Statistics 1999). Many industry experts believe the current lack of an effective, affordable monitoring technology explains the large disparity between the number of convictions and the number of offenders required to abstain from alcohol.

With a philosophical shift toward rehabilitation to combat the impact of alcohol and drug abuse on crime, relief for those in community corrections is seen in recidivism. Whether a community corrections program

defines success by an increase in recidivism—and thus effective implementation of the policing function and protection of public safety, or by a decrease in recidivism—defined as an increase in compliance and rehabilitation—an effective surveillance method can support both objectives, serving as a deterrent for the offender and a reliable policing mechanism for community corrections.

Effective Surveillance

One factor that severely limits the ability of community corrections to establish cost-effective, comprehensive alcohol treatment programs is the availability of effective technology for monitoring court-ordered abstinence. Current technologies tend to be labor-intensive amidst a system that is already stretched to the limits, and the small number of tests leaves offenders with a wide window of opportunity for violation.

The most recent technology to enter the electronic-monitoring arena is transdermal testing, where an ankle bracelet monitors an offender's blood alcohol level by measuring the ethanol migrating through the surface of the skin. The goal of this new technology is to provide the corrections community with an effective alternative for monitoring offenders on a continual, 24/7 basis, and at a cost that is competitive with electronic home arrest proximity monitoring programs that are currently in place around the country.

Transdermal Testing Methodology

A number of independent scientific studies support the strong correlation between breath, blood, and transdermal alcohol levels. In 1985, Dr. Daniel J. Brown of the Department of Pharmacology and Toxicology at Indiana University School of Medicine published "A Method for Determining the Excretion of Volatile Substances Through Skin," which showed that the concentration of alcohol in insensible perspiration is not substantially different from that of breath or blood following complete absorption (Brown 1985). In 1987, *Alcoholism: Clinical and Experimental Research* published "Ethanol Vapor above Skin: Determination by a Gas Sensor Instrument and Relationship with Plasma Concentration," which concluded that skin vapor measurements are comparable to breath alcohol analyzer determinations, stating that the transdermal testing method "may be performed in situations where breath alcohol analyzer measurements are inconvenient

or where continuous monitoring is desirable (H.G. Giles, et al. 1987)."

Based on this scientific foundation supporting the transdermal testing methodology, Colorado-based Alcohol Monitoring Systems has developed SCRAM—the Secure Continuous Remote Alcohol Monitor—which remotely monitors a subject using transdermal testing and delivers information from the offender to supervising personnel. Dr. Thomas Crowley of the University of Colorado Health Sciences Center conducted a test of the SCRAM proof of concept units, confirming that the alcohol readings of the units strongly correlate with breath analyzer readings.

The SCRAM Technology

The SCRAM system encompasses many of the principles of current electronic monitoring technology and is intended to function as one component of a comprehensive program. The system allows each monitoring authority to customize the method of notification for each individual offender, and the technology will work in conjunction with existing monitoring companies that are experienced users of comprehensive case management programs. Intended to function as one component of an intensive-supervision program, rather than an alternative, it can be used in pre-trial, pre-release, probation, supervised release, and parole settings.

The Monitoring Bracelet

The ankle bracelet has two small modules that are held on opposite sides of the subject's ankle by a tamper-resistant strap. Each module weighs approximately 4.4 ounces. The unit is waterproof and is designed to handle the stress of everyday activity. SCRAM's patented information technology automatically measures the subject's alcohol level on a schedule set by the supervising agency. The anti-tamper features included in the system make it difficult for monitored subjects to circumvent or distort readings, and the SCRAM system's patented tamper and interferrant gas detection processes ensure that supervising medical and probation officials can be confident that readings are from the proper subject and accurately represent a subject's blood alcohol level. The Monitoring Bracelet is designed to detect and record any tampering or attempts to remove the device.

The Smart Modem

The Smart Modem, which communicates test results from the subjects home to the Central

Monitoring Station, also facilitates bi-directional communications between the Monitoring Bracelet and the Central Monitoring Station. The Monitoring Bracelet communicates with the Smart Modem via encrypted 900 mhz. radio frequency communications. Users may employ a curfew function that requires the subject to be at home (and within 50 feet of the Smart Modem) each day during a time determined by the case manager. At that time, the Smart Modem sends encrypted information to the Central Monitoring Station via a standard phone line. Alcohol readings, tamper alerts, and diagnostic data are all communicated to the Central Monitoring Station. In turn, the Central Monitoring Station uses the Smart Modem to download monitoring schedules, reporting schedules, and software updates to the Smart Modem and Monitoring Bracelet.

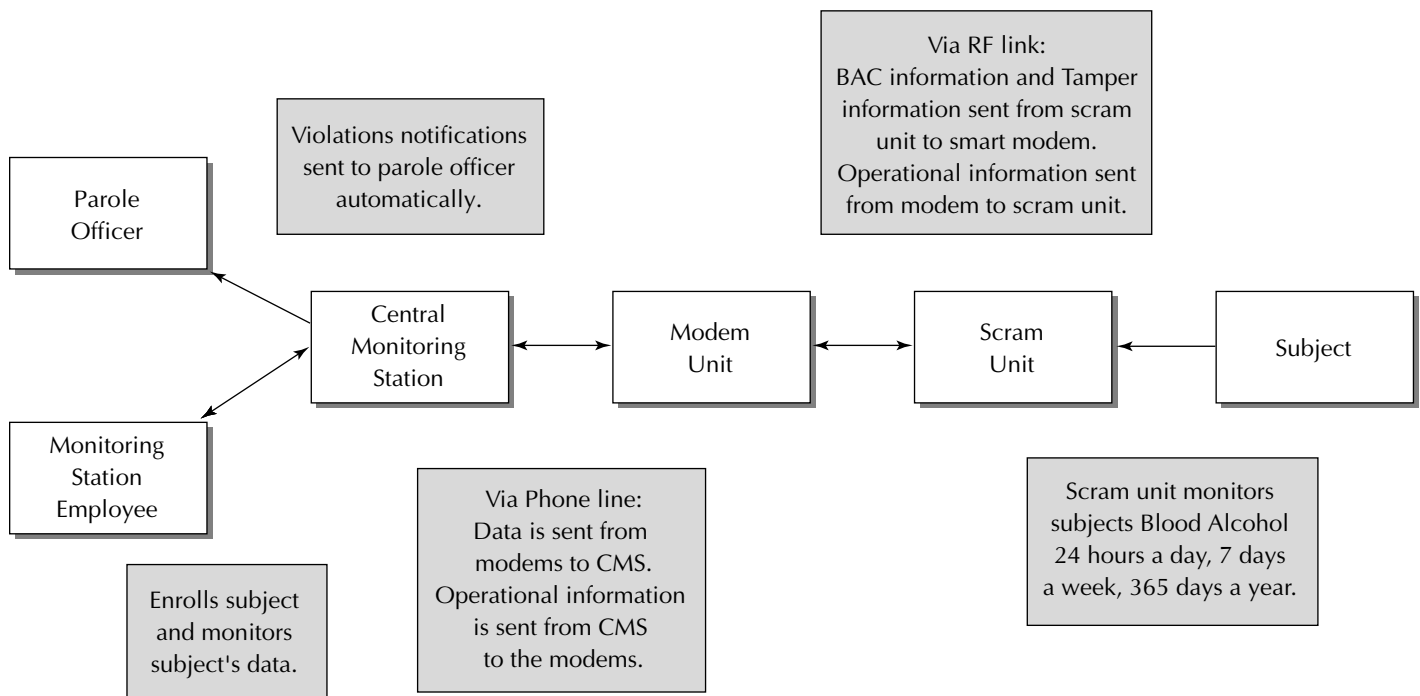
The Central Monitoring Station

The Central Monitoring Station is the control center for the entire SCRAM system. It allows the supervising authority to control the testing, synchronization, and reporting schedules for each unique monitoring subject. During the course of each day the Central Monitoring Station will notify the supervising authority of any positive alcohol readings, tamper alerts, or equipment malfunctions based on the reporting preferences of each case manager. The Internet-based Central Monitoring Station also provides supervising parties with 24/7-access to the alcohol readings of each subject. The supervising agency can print a variety of reports for periods of one day or one year. Figure 1 provides an overview of the system.

A Critical Element, a Comprehensive Solution

Today's conventional wisdom—and fiscal realities—all support the concept of change and rehabilitation. The National Institute on Drug Abuse estimates that, "for every \$1 invested in treatment of drug-involved individuals, taxpayers enjoy a \$4 return in the reduction of costs related to alcohol and drug abuse (NIDA 1992). A 1994 study in California revealed a \$7 return for every \$1 invested (National Opinion Research Center 1992)." CASA estimates that if only 10 percent of substance-involved inmates are successfully treated and trained, the economic benefit in the first year of work after release would be \$8.6 billion. In addition, estimates of the

FIGURE 1
Scram System Block Diagram



number of crimes committed by each abuser range from 89 to 191 per year. At the conservative end, successfully treating and training just 10,000 addicts would eliminate 1 million crimes a year.

Developers of the SCRAM transdermal technology are careful not to position their electronic monitoring program as a complete solution. Instead, SCRAM is designed to work in conjunction with other program elements, including initial offender assessment and on-going client evaluation, substance abuse treatment, home arrest, definitive consequences for violations, and graduated sanctions.

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