From B. F. Skinner to Spiderman

to Martha Stewart: The Past, Present and Future of Electronic Monitoring of Offenders

WILLIAM D. BURRELL
ROBERT S. GABLE

ABSTRACT Electronic monitoring was originally designed as a system to facilitate the rehabilitation of young adult offenders. The concept was not well-received, and the first judicially sanctioned program was not initiated until 20 years later. Adoption of the technology then spread rapidly. The primary use of monitoring has evolved from being an adjunct for rehabilitation of low-risk probationers to a surveillance system for enforcing curfew and house arrest requirements. There are no replicated, well-designed studies showing that monitoring alone reduces recidivism after monitoring is terminated. The authors suggest that the goal of long-term public safety will be most likely achieved if the unique technical capabilities of electronic monitoring are used in conjunction with interventions based on social learning theory.

KEYWORDS Electronic monitoring, offenders, history, social learning theory

INTRODUCTION

Electronic monitoring of offenders (EM) has an intriguing history in American sentencing and correctional practices. First popularized in the
1980s, EM was used extensively as an alternative to incarceration in jail (primarily) or prison, and as an adjunct to traditional probation or parole supervision. Some two decades later, EM shows renewed popularity with the intense interest of legislatures and policy makers in addressing the problem of sex offenders in the community. Increasingly, jurisdictions are requiring lifetime supervision of sex offenders, monitored with Global Positioning Satellite (GPS) surveillance systems. The involvement of the federal government under the Adam Walsh Child Protection and Safety Act (signed into law in July, 2006) will require every state to re-examine their laws and will certainly accelerate implementation of such systems.

The present article briefly reviews the history of EM, summarizes contemporary research with respect to the impact of EM technology on recidivism rates, and suggests how EM can be used more effectively as a tool in the process of offender rehabilitation. There are many reasons to believe that EM will continue to grow and prosper, at least from a commercial perspective. Questions remain, however, about how much it will contribute to the larger societal goal of public safety.

**THE ORIGINS OF ELECTRONIC MONITORING OF OFFENDERS**

Although many writers assert that EM began in the 1980s, applications at that time were just the first successful commercial endeavors. The first experimental application occurred nearly two decades earlier. It proved to be an economic and sociological failure.

In the early 1960s, a small group of researchers at Harvard University began designing a portable transceiver capable of recording the location of volunteers with criminal records (Schwitzgebel et al., 1964). These researchers were strongly influenced by the psychological perspective of B. F. Skinner (1969). They designed a portable unit, termed "Behavior Transmitter-Reinforcer," that sent two-way messages between a base station and young adult offenders who reported their activities and emotions while in natural social environments. The primary goal was to provide feedback to the offenders for the purpose of rehabilitation and social support.

The inspiration for the system came when the head of the research project, Ralph Kirkland Schwitzgebel, was watching the film, *West Side Story*, in which the hero is killed by an opposing gang member. Schwitzgebel had the idea that if the hero could have received help or a warning, his
life would have been saved. Subsequently, all of the monitoring systems of the original Harvard research group included some form of two-way signaling capacity.

Although a few scholarly papers raised appropriate issues of civil liberty, the reactions to the prototype systems were generally negative. The situation was not helped when the editors of the *Harvard Law Review* (1966) chose a witty title ("Dr. Schwitzgebel’s machine") for an otherwise serious and insightful article. In addition, inaccurate reporting by a few journalists (e.g., Gordon, 1989) resulted in the myth (still circulating) that a "Schwitzgebel Machine" used brain implants to track offenders and transmit verbal instructions (Everything2.com, 2001/2007). The eminent constitutional law scholar, Laurence Tribe (1973, pp. 331-332), noted that the inventor "attempted for several years to explore the potential abuses of the technology he was developing, but was rebuffed by virtually every professional organization, foundation, and citizen group to which he turned."

It is interesting to speculate why this first EM application failed to gain traction. Several factors seem to have inhibited its adoption. The first had to do with the social acceptance of changing behavior by use of positive reinforcement. At that time, the public was much less familiar with Skinner’s concepts of behavior modification, and thus less trusting of the procedures. The second was the use of electronic technology for remote monitoring of individuals. It is not difficult to understand an Orwellian “1984” type of reaction—EM was a tangible manifestation of “Big Brother.” Third, the pioneering work was done in the pre-digital era of the mid 1960s. Transistor radios and color televisions were still novelties for many people. The computer age had not yet dawned for the consumer, and the EM technology was a leap that few were ready to make. Lastly, EM was an innovation that was so philosophically and operationally distant from the existing correctional “technology” (Vaill, 1978) that practitioners could not conceive using it. The technology transfer literature shows that in order to be adopted by practitioners, innovations must at least be perceived as feasible (Rogers, 2003). In retrospect, the original EM was probably just a little too “sci fi” for its own good.

**WINDS OF CHANGE**

The decade of the 1970s saw significant changes in sentencing and correctional policy arenas, as well as in technology. The rehabilitative
model of indeterminate sentencing, discretionary parole release, and offender treatment was all but eliminated (Cullen & Gendreau, 2000). The new model was determinate, punitive, and offense-focused. Increasing numbers of offenders were locked up for longer terms, and the jail and prison populations in the U.S. exploded (Langan, 2005). Probation also saw significant increases in their caseloads (Livsey, 2006), and the driving philosophy of community supervision shifted away from rehabilitation to surveillance and enforcement. The system was in crisis and needed help.

In the realm of technology, it was the dawn of the digital age. The microprocessor made possible advances that were unimaginable only a few years before. The range of innovations that appeared in that era transformed almost every aspect of contemporary life, including criminal justice. Improvements in electronic technology and the pressures of jail and prison crowding made the idea of offender monitoring more feasible and more palatable. Two decades after the first system was assembled in Cambridge, Massachusetts, from surplus missile tracking equipment, the dark years of EM came to an end. In this new era, it was a judge (struggling as so many do to find better sentencing options) who saw EM as a potential solution to a growing problem.

In 1983, New Mexico state district judge Jack Love sentenced three offenders to home curfew. This was the culmination of years of effort and consternation during which Judge Love, who had previously served as a Federal public defender, sought ways to keep certain non-violent offenders from going to jail. In 1977, two items in a local newspaper caught his attention. One item showed a photograph of a heifer. A small radio transmitter had been implanted under the skin of the cow, and a hand-held detector received information about the animal’s history and diet requirements (Holm et al., 1977). The second newspaper item was a Spiderman cartoon in which the villain clamped a bracelet-style “radar device” on Spiderman in order to track his movements. (The Spiderman cartoon story has attained the status of an urban myth in criminal justice, but Judge Love confirmed its accuracy by showing cartoons that he had filed away [Love, 2006]).

Judge Love subsequently went to several technology companies hoping to sell his idea of electronic monitoring of offenders. All declined to help. However, a computer sales representative at Honeywell, Michael Goss, was convinced. Mr. Goss left Honeywell in 1982, formed a company (NIMCOS—National Incarceration Monitoring and Control Services), secured a $10,000 bank loan, and built several cigarette-pack-size transmitter units designed to be strapped to an ankle. The
transmitter propagated a radio signal every 60 seconds that could be picked up by a receiver connected to a telephone line, and then transmitted to a mainframe computer. Loss of the signal occurred at distances greater than approximately 150 feet (45 meters), and could therefore indicate a potential violation of home detention.

In April, 1983, the first of three probationers was sentenced to monitored home detention as a condition of probation. The probationer, a heroin user with a steady job and an infant child, was convicted of writing bad checks. This probationer successfully completed his 30-day sentence on monitored curfew. Unfortunately, 60 days after his curfew ended, he was arrested for shoplifting. The second person, a Vietnam veteran studying to be a computer technician, was placed on 30-day monitored curfew for violating probation after receiving stolen property. Although this probationer did not violate his monitored night-time curfew at a local detention center, on the fifth day of his sentence, he returned to the center intoxicated and was subsequently sentenced to jail. The third individual, a diabetic convicted of a second DUI offense, successfully completed his 30-days of monitoring.

A few months after the initial monitoring experiment, Michael Goss's namesake system (the "GOSSlink") ceased operation because the company had depleted its funds. It should be noted that two of the three offenders sentenced by Judge Love to EM ultimately recidivated; follow-up information for the third is not available. The immediate goal of confinement was achieved, but the longer-term goal of crime reduction was not.

One of the sources of Judge Love's inspiration (i.e., identification tagging of livestock) was not forgotten, however. Mr. Goss made a desperate but timely offer to Boulder Industries (BI) that itself was having difficulties selling several innovative electronic devices—one being an "electronic dairy I.D. system." According to BI's former president and CEO, David Hunter (2006), he asked an assistant to conduct a marketing survey among correctional agency personnel regarding their opinion of EM. The opinion of correctional personnel was reported as follows: "We don't want it" (viz., too much work), "we don't like it" (viz., threatens our jobs), "we've never done it before" (viz., it's too new), and "we don't like you" (viz., a private company shouldn't be involved in probation/parole work). Mr. Hunter's self-described reaction was—"This is a real business opportunity!" Shortly thereafter, BI loaned NIMCOS $250,000, and arranged for Control Data of Minneapolis to be the exclusive marketing agent. The arrangement did not work out (due, in part, to the near-bankruptcy of Control Data as a result of its
other diverse operations). All rights and assets of NIMCOS were eventually purchased by BI for another $250,000.

NIMCOS/BI had only one generally recognized competitor during its first year of operation. In December, 1983, Monroe County (FL) judge Allison DeFoor sentenced a 28-year-old carpenter in Key Largo to a weekend of home detention for driving without a license (Shillington, 1983). The 48-hour sentence began when inventor Thomas Moody attached a transmitter anklet to the probationer and installed a receiver in the probationer’s trailer. The radio transmitter and the home-based receiver were manufactured by Mr. Moody’s company, Controlled Activities Corporation (CONTRAC), located in Key Largo, Florida. The anklet consisted of a 5 x 3 inch plastic transmitter in the shape of a half-cylinder that sent signals every 35 seconds to the receiver that was, in turn, linked via telephone line to a computer at Moody’s 24-hour monitoring service, Omni Communications, Inc.

An experimental project testing a full implementation began November, 1984, in Palm Beach as a joint operation between Controlled Activities, the Palm Beach County Sheriff’s Department, and Pride, Incorporated, a private nonprofit probation agency that continues to operate a monitoring program to this day. The first probationer, a 20-year-old student convicted of DUI, was permitted to spend nights and weekends at her home and to pay a $250 fee to offset the cost of the experimental program. A follow-up of 415 cases from late 1984 through October, 1989 reported that “ninety-seven percent of the offenders completed their electronic monitoring period successfully, and nearly 80 percent completed their entire term of probation” (Lilly et al., 1992, p. 42).

Between 1986 and 1996, the pool of manufacturers and service providers grew, shrank, consolidated, grew again, and has generally been in flux ever since. In less than three years from the first judicially sanctioned experiments, at least 53 EM programs in 21 states had been initiated (Schmidt, 1987). A newsletter, Offender Monitoring (changed in Spring 1989 to Journal of Offender Monitoring), was initiated by Professor Marc Renzema in October, 1987. The newsletter listed 10 suppliers, and Renzema (1987) estimated that between 4,000 and 5,000 offenders had worn EM devices. Although there are no comprehensive national data, the current editor of the Journal of Offender Monitoring has estimated that approximately 100,000 offenders were on EM in 2006 (Conway, 2006).

This rapid acceptance of EM was followed by the establishment of an information clearinghouse, creation of professional guidelines, and publication of evaluation studies. Some notable events in the development of EM are listed in Table 1. In explaining the popularity of EM, we
cannot discount the popular fascination with technological innovation. We in the United States have great faith (largely well placed) in the capacity of technology, primarily computer-based, to solve problems and improve our lives. In a field that is so human capital intensive as corrections, the idea that a "technological fix" could reduce the workload in dealing with the problem of crime is almost irresistible (Corbett & Marx, 1991).

Table 1: Notable Events in Electronic Monitoring, United States, 1964-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>References</th>
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<tbody>
<tr>
<td>1964</td>
<td>Transceivers used for location monitoring and &quot;behavioral feedback&quot;</td>
<td>Schwitzgebel et al. (1964)</td>
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<tr>
<td>1965</td>
<td>Radio transmitters used for psychotherapy with hyperactive children</td>
<td>Patterson et al. (1965)</td>
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<td>1971</td>
<td>Publication proposes large network of offender-carried transponders</td>
<td>Meyer (1971)</td>
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<td>1983</td>
<td>Two companies begin manufacturing and using monitoring systems</td>
<td>Goss (1983); Shillington (1983)</td>
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<tr>
<td>1985</td>
<td>NLU report describes home confinement, lists six companies offering service</td>
<td>Ford &amp; Schmidt (1985)</td>
</tr>
<tr>
<td>1992</td>
<td>Evaluation published of results with first 415 offenders in Florida</td>
<td>Lilly et al. (1992)</td>
</tr>
<tr>
<td>2006</td>
<td>Large study of offenders placed on home confinement in Florida</td>
<td>Padgett, Bales, &amp; Blomberg (2006)</td>
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DOES IT WORK?

Evaluation studies of EM programs began almost simultaneously with the spread of the technology, and many of the studies drew a favorable conclusion about the potential of EM. Most of the studies, however, suffered from problems of erratic implementation, equipment malfunction, and weak research design. In a 1997 report to the U.S. Congress, a federally funded research team (Sherman et al., 1997) listed home detention with EM as a crime prevention strategy that "doesn't work." The report's conclusion was based on two carefully designed studies with randomly assigned control groups.

Subsequent studies have reported mixed results. Bonta, Wallace-Capretta, and Rooney (2000) found that EM combined with treatment significantly reduced recidivism among moderately high-risk offenders, but had no effect on lower-risk offenders. Indeed, several studies (Gendreau et al., 2000; Erwin, 1990) suggest that intensive supervision with EM may actually increase recidivism, perhaps as a result of resentment or increased criminal association. A very dramatic reduction in re-conviction rates was reported by the National Audit Office of the U.K. (2006). Their analysis showed that 51 percent of offenders who completed a community-based sentence were re-convicted of another offense within 24 months. Only 12 percent of offenders on EM were re-convicted within 24 months. The audit report notes, however, that some of the difference may have been the result of a selection bias in which those offenders less likely to re-offend were released into the EM programs. This lack of a statistically matched control group is typical of many studies.

The most comprehensive and rigorous meta-analysis of evaluation studies to date "failed to find any convincing evidence that EM is superior to other prison diversion programs" (Renzema & Mayo-Wilson, 2005, p. 17). This does not imply that EM is useless. There is probably some suppression of criminal behavior during the actual monitoring (Padgett, Bales, & Blomberg, 2006), and this provides at least a temporary increase in public safety. Probation, with EM as a condition, also provides an intermediate sanction between prison and traditional community supervision. The degree of inconvenience, discomfort, and restriction that EM can enforce is one way to emphasize to the offender the seriousness of the crime. The most visible example in the United States has been the post-prison supervised release of entrepreneur and TV personality, Martha Stewart. She was sentenced to five months of monitored confinement on her 153-acre estate following five months in
prison for lying to federal investigators about insider stock trading. This condition of release was certainly not imposed as a matter of public safety. Nor was surveillance a means of assuring her attendance at a job-training or a social skills class. Rather, Ms. Stewart had become the public whipping girl of corporate malfeasance. Her home confinement with EM was a manifestation of the punitive intent behind her sentencing. In rejecting an appeal for regular parole by Ms. Stewart, U.S. District Judge Miriam Cedarbaum (2005, p. 2) wrote: “In my opinion, the sentence I imposed was particularly needed to reflect the seriousness of the offense, to promote respect for the law and to provide just punishment.”

As previously noted, the growth of EM is being encouraged by sex offender legislation. However, sentences such as life-time supervision with GPS have the potential for creating catastrophic consequences in community corrections (DeMichelle, Payne, & Button, 2007). First, there will be unrelenting growth in sex offender caseloads because these cases will never (at least for the foreseeable future) be terminated from supervision. Second, given the high priority that these offenders are suppose to receive, probation and parole agencies are likely to assign them to small caseloads with increased levels of supervision. This will compound the caseload growth by giving each sex offender’s case added weight in calculating staffing needs. Lastly, the GPS technology works around the clock, seven days a week, monitoring and reporting violations whenever they occur. At present, it is impossible to know the volume of alerts that will be generated, or their distribution over time, but it is not unreasonable to expect significant numbers of alerts both day and night. Some alerts will be real (intentional violations of restricted areas such as playgrounds), others could be more circumstantial (unintended violations while traveling to a legitimate location), and still others could be false alarms or technological glitches.

Another increasingly popular use of GPS monitoring that should be mentioned is the protection of victims of domestic abuse. In domestic abuse cases, an offender may be prohibited from coming within approximately 300 feet (100 meters) of a victim’s home or workplace. Regardless of the nature of a GPS violation, the expectation of policy makers and elected officials is certainly that someone (be it a probation/parole officer or law enforcement officer) will respond as soon as possible to a GPS alert. The integrity of the entire program requires that violations receive a timely and appropriate response. If offenders can violate the terms of their supervision and no one takes note, those terms and the supervision lose credibility. Failure to respond in a timely manner also exposes the agency and staff to the possibility of a liability claim.
for negligent supervision. Changes in policies concerning hours of work, schedules, after-hours work, and overtime pay have now become issues that need to be addressed.

An unfortunate result of increased staff burden is the tendency to resort primarily to surveillance and punishment. However, research and experience of the last two decades strongly suggest that the most effective means to reduce re-offending by criminals and delinquents is not to just incapacitate and punish them, but to address the motivation for their law-violating behavior, their criminogenic risk factors (Andrews & Bonta, 2006). Incapacitation and punishment are legitimate goals for sentencing, but they have limited utility in achieving the “super-ordinate function” of the criminal justice system—protecting citizens from victimization by reducing long-term crime (Flanagan, 1996, p. 5).

Inasmuch as EM in most of its present forms does not address the criminogenic risk factor of offender motivation, monitoring alone is not likely to affect public safety after the offender is no longer under the jurisdiction of a correctional agency. Although EM can document an offender’s location, it does not tell us what the offender is doing. A sex offender, for example, might be victimizing a child in the offender’s home or the victim’s home. Data suggest that this is the scenario for the vast majority of child victim sex offenses. A U.S. Department of Justice survey reported that 46 percent of all sexual crimes against children were committed by persons related to their victims; only seven percent of child sexual assaults were committed by complete strangers (Langan, Schmitt, & Durose, 2003). GPS programs appear to be promising more than they can deliver (DeMichelle, Payne, & Button, 2007). Add to such unrealistic promises the stress placed on community corrections agencies, and the picture looks very grim indeed.

AN ALTERNATIVE FUTURE

Rehabilitation has returned to the marketplace of ideas in public policy. This renewed discourse is being driven by a compelling body of empirical evidence that some types of correctional treatment of offenders are effective (Andrews & Bonta, 2006). This research, now called “evidence-based practice,” is being considered by policy-makers who are frustrated by the lack of effectiveness of “get tough” approaches, hamstrung by ever-increasing costs, and intrigued by the success of the overtly treatment-oriented drug courts (Cooper, 2001). Even in such a
notoriously punitive state as Texas, legislators are endorsing rehabilitation programs over prison construction (Ramshaw, 2007).

Central to this new evidence-based approach to corrections is the same analysis of social contingencies that informed the inventors of EM some 40 years ago. Psychologist B. F. Skinner (1969) emphasized that social behavior is shaped and maintained by the specific nature and timing of consequences. Akers (1994), Bandura (1977) and others subsequently incorporated Skinnerian behaviorism, along with other theories such Sutherland’s differential association theory, into a well-known social learning theory of crime. No theory adequately describes all the principles necessary for successful intervention, but substantial research over several decades indicates moderately strong support for the differential reinforcement aspects of the social learning theory of crime (e.g., Brezina & Piquero, 2003; Jessor & Jessor, 1977; Winfree, Vigil-Backstrom & Mays, 1994). In the review of principles of effective correctional treatment enunciated by Andrews and Bonta (2006), social learning theory serves as the predominate theoretical model. Also, behavioral techniques drawn from social learning theory and operant conditioning are reportedly used in the majority of probation service programs in the U.K. (Vennard, Sugg, & Hedderman, 1977). It appears that EM need no longer be an ideological orphan; evidence-based practice utilizing social reinforcers can provide a good home.

Probably the best examples of the use of positive reinforcement in criminal justice are the drug courts. They have recognized, embraced, and greatly expanded the use of small, seemingly insignificant rewards for offenders who exhibit and maintain sober, law-abiding behaviors. The Henrico (VA) County Drug Court (2006, p. 1), for example, includes in its brochure given to offenders the following statement:

A variety of rewards will be awarded weekly during Drug Court in an attempt to quickly recognize the positive actions of participants. Incentives will be used to recognize completion of assignments, phase progression, periods of sobriety, etc. Incentives will include gift certificates or gift cards, prizes from local merchants, movie passes, bus passes, certificates and medallions, etc.

Cooper (2001) has provided a detailed listing of different types of incentives used in more than 30 drug court programs. The Bureau of Justice Assistance (2004, p. 11) Drug Court Discretionary Grant Program guidelines has required applicants to “indicate what graduated incentives and sanctions are used in the [proposed] program.”
The hundreds of drug courts currently operational in the U.S. have developed their own, somewhat unique approach based on an accepted and established set of principles for drug courts (NADCP, 1997). It is useful to begin this limited exploration of an alternative future for EM by articulating several elements or principles that should form the foundation for an incentive-based model of EM. These principles would help guide those pioneers who seek to implement new programs and explore the potential of this new paradigm.

An incentive-based EM program would include the following elements:

1. *Clearly articulated principles of social learning theory.* Well-documented developmental studies report that parents, teachers, and peers are routinely provoked by antisocial children and adolescents into administering excessive punishment that, in turn, prompts still more antisocial behavior (Church, 2006). A classroom observation showed that only 11% of a teacher’s interaction with troublesome students involved approval for desired behavior while 89% involved negative responses for inappropriate behavior. Conversely, normal students received about 80% supportive interactions and only 20% negative interactions (Walker & Buckley, 1973).

   Thus, based on such observation, positive reinforcers should outnumber sanctions in the normal course of supervision, and be given contingent on gradual improvements of an offender’s behavior (a procedure known as “shaping” in operant conditioning). Although immediate and front-loaded reinforcement is usually more effective in the early stages of a learning process, this may not be practical in a supervisory context. In fact, an increased interval between response and reinforcement is preferable toward the end of training (Van Camp, Borrero, & Vollner, 2003). A technically accurate and realistic description of strategies for administering rewards and sanctions to felony drug clients has been provided by Marlowe (2007).

2. *Gradual changes in agency procedures.* Ideally, positively oriented EM would be guided by feedback of relevant offender behavior over a period of one to three years. Establishing an incentive program is, unfortunately, a front-loaded task where start-up costs are immediate and possible benefits are delayed.
An innovative probation incentive program in Pinal County (AZ) found that getting staff buy-in, not acquiring appropriate incentives for the clients, was the most difficult aspect of establishing the service (McBride, 2007). Many officers see their primary responsibility as holding offenders accountable for compliance with probation or parole conditions. Attempting to develop prosocial behavior among offender clientele, particularly after supervision has ended, is not only difficult but may go unrewarded by supervisors. White (2006) has outlined practical steps for developing an office culture supportive of evidence-based, behavior-change practices.

3. Incremental fade-out of monitoring restrictions. In order to increase the probability of long-term behavior change, an offender’s EM restrictions should be slowly replaced by variable rewards for prosocial behavior produced by the natural social environment. This program element is not easily achieved. Too often, as a result of very limited options, offenders are released into the same or similar social environment that encouraged the original problem behavior. Thus, while the usual goals of finding employment, starting a hobby, and developing law-abiding friendships are desirable, the goals must be broken into small intermediate steps (e.g., learning to arrive promptly at job interviews appropriately dressed). The Community Reinforcement Approach is one reportedly effective behaviorally oriented program that attempts to develop familial, social, recreational, and vocational incentives in an offender’s natural environment (Finney & Monahan, 1996). This approach is illustrated in a study of violent criminal offenders with alcohol problems in which employment levels were significantly improved (Funderburk et al., 1993).

The practice of giving rewards of varying degrees of value at unpredictable intervals of time (technically termed a “variable ratio–variable interval” schedule of reinforcement) is a common strategy for sustaining behavior. Lotteries and raffles rely on such ambiguity. People who purchase a ticket are not sure when or how much, if anything, they might win. Checking e-mail is another behavior that is maintained by the varied nature of the consequences. In probation or parole, for example,
a variable reward schedule could be easily implemented with low-risk offenders who use a computer kiosk check-in system.

Similarly, positive reinforcers could be delivered in conjunction with alcohol monitoring systems. One well-known system uses a tamper-resistant ankle bracelet (SCRAM®, Secure Continuous Remote Alcohol Monitor) that tests perspiration excreted through the skin. Because the monitoring agency can set the intervals at which the bracelet does the testing, a detailed pattern of alcohol use or abstinence can be obtained. Other remote alcohol testing devices that use a standard telephone line (e.g., iSecureTrac 2000VB®, Sobrietor®) are particularly amenable to re-design to the extent that they could permit immediate positive feedback at remote locations for clean tests or other desired behavior.

The future of EM will continue to change with advances in electronics, particularly cellular and battery technology. Bluetooth-enabled cell phones can be used to verify the location of willingly tagged individuals. A network of transceivers might be installed and periodically moved in order to create an “electronically enriched” urban area where offenders could become eligible for a reward if they spontaneously exhibited cooperative rather than aggressive social behavior. Social psychologists have developed numerous strategies for unobtrusively measuring helping and cooperative behavior in a wide range of social settings (e.g., Levine, 2003).

CONCLUSION

In the past 40 years, much has changed in the EM environment. Most of the original service providers have disappeared or been replaced. Equipment has become smaller, more dependable and sophisticated. Some legislators have adopted EM as an “effective intermediate sanction tool” for high-risk offenders (Prouty, 2005, p. 2). Nonetheless, as a technology for promoting humane rehabilitation, it has yet to demonstrate its efficacy. Electronic monitoring remains as Professor Renzema (1987, p. 1) described it in the first issue of his newsletter—“an oddity with great potential.”

The challenge is how to realize the rehabilitation potential of EM. The answer lies in going beyond the technology, to the underlying science of human behavior (Burrell, 2006). As applied to date, EM has generally lacked the science and a credible theoretical construct to guide its use. In her discussion of officer-offender contacts in supervision, Taxman (2002) noted that contacts are just tools for the officer to apply.
They have no inherent value; they are atheoretical. Firmly anchored in a well-grounded theory, these tools can be applied effectively to achieve the goals of supervision. Absent those anchors, tools such as supervisory contacts and EM are destined to uselessly absorb valuable time, resources, and energy. The appeal of technology such as EM should be tempered by a pragmatic concern for sound science to guide its use. Social learning theory and evidence-based practices provide such a guide.

REFERENCES


AUTHORS’ NOTES

William D. Burrell, MA, is Director, Executive Master of Arts program. Department of Criminal Justice, Temple University, 530 Gladfelter Hall, 1115 W. Berks Street, Philadelphia, PA 19122-6089 (E-mail: wburrell@temple.edu).

Robert S. Gable, Ed. D, PhD, JD, is Professor of Psychology Emeritus at Claremont Graduate University.

Address correspondence regarding this article him at to 2738 Fulton Street, Berkeley, CA 94705 (E-mail: robert.gable@cgu.edu).

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