

Evaluative Research on Electronic Monitoring
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If one looks at the history of corrections, one sees that most—if not all—innovations in corrections have been greeted with enthusiasm and great expectations. The “crime problem” was going to yield to the penitentiary, the reformatory, indeterminate sentences, probation, intensive probation supervision, and boot camps—to cite only a few of the best known examples of major changes. So far, crime has proven quite resilient and the innovations, although they never lived up to the expectations of their creators, have become part of the criminal justice system despite their disappointing impacts on the “crime problem.”

Almost four decades ago Ralph Schwitzgebel (1968, p. 99) wrote:

“Recent developments in electronic technology greatly increase the possibility of deterring the commission of certain types of offenses in the community. When specific, offending behaviors can be prevented, it will no longer be necessary to imprison an offender in order to protect the community. The offender may be safely released on parole, thus increasing his or her freedom, while at the same time the community will be exposed to less risk than under present release procedures.”

Was Dr. Schwitzgebel correct? Certainly the potential existed, but after more than two decades of large scale use of electronic monitoring, do we yet know whether there has been significant impact on offender behavior? The short answer is that we know a little and that by and large the potential implicit in the technology remain unfulfilled. But, as always in matters of criminal justice policy, the realities are complex and sometimes elusive.

First off, to gauge whether Dr. Schwitzgebel’s¹ optimism was warranted, one needs to break down the overall issue of impact into several researchable questions.

Key questions for empirical research

1. *Does electronic monitoring affect recidivism after the electronic monitoring period has concluded?*

In the early days of electronic monitoring [hereafter “EM”], there was folklore among using agencies about what might be called the rustification of offenders.² To exaggerate only a little, the idea was that if one put enough structure in an

¹ Ralph Kirkland Schwitzgebel and his brother Robert are widely credited as being the first people to experiment with electronic monitoring devices on offenders. They both continue to write seminal articles under the changed family name of Gable.

² Rustification appears to be a “made-up” word derived from the word rustic and seems to mean moving the offender from a fast-paced, frenetic existence to a slower, simpler, more countryside-like life. Such anecdotes were common at

offender's life and restricted access to criminal associates and a criminogenic environment, after a time the offender would come to enjoy the satisfactions of a cottage with a white picket fence, working for a living, and playing with his or her children—thereby desisting from crime. In essence, EM could be per se rehabilitative. Also possible was that EM would be so unpleasant that offenders would be deterred from future misdeeds even after it ended. A third rationale is that EM could increase participation in and compliance with other kinds of programs that would carry most of the burden of rehabilitation, for example vocational training or substance abuse treatment.

In terms of published research, this means that one needs to look at who receives EM, for how long, what the alternatives are³, and what other program elements are delivered to both the EM recipients and to those with whom their recidivism is compared. Sadly, even when groups are reasonably equated, many of the needed descriptive elements have not been reported. Especially defective are reports of what adjunctive treatments or services are received, particularly for comparison groups. Attempting to sort out why one study reports favorable results while another is slightly negative is often fruitless.

2. *Does EM affect offender criminal behavior during the monitored period?* Whether one wants to call on classical criminological theory, routine activity theory, or other theories that consider the social and/or psychological dynamics of criminal behavior, there is good reason to think that, at least for its duration, at least some offenders would be more likely to desist from crime than if they were not under monitoring. On the other side, although empirical evidence is largely missing, are the ideas that resentment, stigmatization, family conflict, and labeling could actually worsen the probabilities that those under EM will commit crime. Also arguable is that EM might not affect criminal behavior at all, but that those under EM are more easily caught for new crimes and would thus manifest higher official recidivism than those not monitored. It is easy to conceive why EM might reduce recidivism while in operation but not afterward, and one can also conceive a positive post-EM effect but a negative impact during monitoring. Thus, the questions of impact during and afterward both need to be asked separately.

3. *Does EM have positive or negative impacts other than those on offender criminal behavior?* Do, for example, offenders become depressed or commit more domestic assaults while on EM? Are family members positive or negative about their offender's EM? The evidence here is often anecdotal or from poorly-crafted exit surveys, but some information is known and will be discussed briefly later in this chapter.

practitioner professional meetings in the late 1980s.

³ In terms of deterrence, whether EM is seen by the offender as a gift (the alternative being jail) or as an enhanced sanction (the alternative being community status without EM) could be relevant.

This chapter is a secondary product of an ongoing and unfinished meta-analysis commissioned by the Campbell Collaboration on the impact of EM on offender behavior. Because of this primary mission, I am less prepared to address two other critical research questions, but an agency using or considering EM absolutely needs to marshal the evidence on them. If one is able to conclude that EM reduces recidivism, or *at least does not worsen it*, and EM does not worsen the psychological situation of the offender or the offender's family, one also needs to ask two additional questions:

4. *Aside from recidivism impacts, what is the financial impact of operating EM?* On one hand EM could potentially avert prison construction or inhuman conditions. On the other, it could divert funds from programs that might have a higher payout in terms of public safety.⁴

5. *Does EM allow more people to be dealt with more severely than they would have been had it not been used?* These are the issues usually called net widening and net strengthening. Most criminologists decry “net widening” while others (often politicians and talk-show hosts) conclude that more people need to be more highly controlled. Wherever one stands on the issue, it is clear that EM and other intermediate sanctions have the potential to expand and increase the control of the criminal justice system and that the degree to which this occurs needs to be understood so that unintended consequences do not occur.

Unlike the general issues of recidivism and unintended side-effects, these last two questions are likely very much jurisdiction specific and not as susceptible to a systematic review. They should, however, be very important to the planners and operators of offender monitoring systems.

Having set out some general questions, it is necessary to deal with some obstacles immediately apparent when one attempts to answer them.

⁴ For example, in a seminar at the U.S. National Justice in Washington, D.C. on April 21, 2010, titled “Less Prison, More Police, Less Crime: How Criminology Can Save the States from Bankruptcy”, Professor Lawrence Sherman argued that, in general, the crime-reduction impact of certain police innovations have been well-proven while most correctional interventions have not been; society would be safer and crime control would cost less if money currently being spent on prisons and other correctional programs were instead spent on police.
<http://www.ojp.usdoj.gov/nij/events/research-real-world.htm>

The slippery nature of EM

Does surgery work? Anyone with half a brain instantly grasps that this is a stupid and impossible-to-answer question. Before starting to answer one would need to know the diagnosis, how far the disease had progressed, the general condition of the patient, co-existing conditions, concurrent treatments, the specific procedure being used, and probably something about the surgeon's training, prior experience, and instrumentation. Yet I am frequently asked whether EM "works." In most cases, what the questioner wants to know is whether it affects recidivism, but not always.

As suggested by the research questions above, there are different goals for EM use but there are also different means by which it might achieve those and other goals. For example,

- EM might reduce recidivism by aiding the shaping of behavior through positive reinforcements of the sort envisioned by the Schwitzgebel brothers.
- EM might reduce recidivism by increasing offender accountability during the period of monitoring as suggested in research question #2 above.
- EM might not have independent impact on behavior, but the accountability it brings to treatment attendance might increase the impact of treatment, thereby reducing recidivism.
- EM might have no direct impact on recidivism but could contribute to slowing of rises of correctional expenditures and reduced taxpayer burdens by helping to avoid the construction and operational costs of jails and prisons.
- EM might increase the frequency of official recidivism while simultaneously reducing the amount of overall harm done by recidivists through more efficient detection of criminal behavior and removal of the offender from the community before much harm is done.⁵
- EM could increase general deterrence by making community sanctions more onerous or it could reduce it if potential offenders perceive that the consequence of a given act is not jail, but "only EM."

Not only are the real and potential program goals diverse and possible indicators of success and failure sometimes conflicting (i.e. recidivism could be a success in one program but a failure in another), but the populations subjected to EM are diverse. My colleague in the Campbell project, Evan Mayo-Wilson, argues that the psychological impact of being placed on EM might be quite different depending on whether the offender perceives it as a "gift" (e.g. early release) or "intensified punishment" (e.g. as an alternative to minimally supervised probation).

Diverse populations

⁵ Although few EM program administrators are willing to formally declare precipitating incarceration as a program goal, it is clear from my informal conversations with both line staff and program administrators that EM is sometimes used to expedite collection of evidence of rule violations on the theory that once an offender gets on the "slippery slope", then rules violations and criminal behavior will become more frequent and severe.

It seems unreasonable to expect EM to have similar impacts on juvenile delinquents awaiting disposition (who would otherwise be detained) and adjudicated delinquents for whom it is an enhancement to regular probation. EM has been used for pretrial release for those accused of everything from shoplifting to non-capital murder. Ages of those monitored have ranged from 10 to at least into the 80s and, of course, contingencies change during the lifespan.⁶ Some using agencies have excluded alcoholics and other addicts, others have accepted them. At least one agency has used Global Positioning System [hereafter “GPS”] monitoring with developmentally disabled pedophiles. Although the conventional wisdom is that to succeed on monitoring an offender should not be psychotic (or in the throes of addiction), EM is routinely used on stalkers and domestic violence offenders. Criminal histories range from fairly minor first offenders to people who have had multiple felony convictions. I have encountered offenders who were very embarrassed or felt humiliated by wearing monitoring bracelets but have heard of others, particularly adolescents, who are said to enjoy the status of being “bad” signified by their monitoring bracelet. For them EM may be akin to getting a jailhouse tattoo, a sign of manliness and potency.

Application at diverse stages in the criminal justice process

EM has been used in the criminal justice process at both the “front-end” and the “back-end.” The “front-end” uses of EM include pretrial (or pre-adjudication) as a condition of bail or in lieu of bail, as an alternative to the criminal process (pretrial diversion), probation, and intermediate sanctions such as work release centers and day-reporting programs where the legal status of the monitoree is closer to that of an inmate than to a probationer. It has also been used as an alternative to the incarceration of rule-violating probationers. On the “back-end”, that is after incarceration, EM has been used in an attempt to gradually increase the responsibilities of reintegrating parolees (a “step down” in structure and control). Other uses have included increasing surveillance of inmates in work release centers and sanctioning rule violations that fall short of those mandating reincarceration. In some cases EM appears to be used solely to punish or for the appearance of toughness. An example is rich American entrepreneur and celebrity Martha Stewart who served five months on EM following a short prison sentence for obstructing a federal investigation of insider stock trading (Masters, 2004). I recall one particular case, a California parolee who had mutilated a 15-year old

⁶ A 10-year-old was reported in a personal communication from Dennis Doffing; a table in a California evaluation report showed one sex-offender on GPS parole was 81.

girl, where two monitors of different types were placed on him because of both genuine risk and need to pacify a public that was horrified by his release.⁷

Diverse and changing technology

Evaluation of impact is difficult given that the diversity of programs, offenders, and the several families of technologies are all subsumed under the term “electronic monitoring”. With the exception of the recent works by Padgett, Bales, and Blomberg (2006) and Bales, Mann et al. (2010) that included GPS monitoring and a couple of early pieces that used “token verifiers” or a mix of “token verifiers” and “continuous signaling” equipment, all of the published research to date has focused on “continuously signaling equipment,” which is a small blessing that is unlikely to endure for long as technology continues to evolve. In the early days of EM there were only two basic approaches available. One involved a machine placing random calls to the offender’s residence. The offender would answer the phone and verify his or her identity by inserting a wrist or ankle-worn keystone shaped magnet into a wand attached to a telephone, i.e. a “token verifier”. Other approaches to identity verification involved electronic analysis of speech (so-called “voiceprints”), an officer later listening to the telephone robot’s tape recording, the offender punching in a code on the telephone keypad with the code being generated by a watch-like device securely attached to the offender, or even slow-scan television images transmitted over the telephone line and compared to reference images by a human operator.

The second core approach, usually called “continuous signaling,” involved a radio transmitter secured to the offender’s ankle or wrist and a receiver attached to the offender’s home telephone. The receiver was programmed to “listen” for the transmitter’s signal and to store and report when the offender was and was not in the vicinity of the receiver. It is difficult to compare more recent research done using continuous signaling equipment with some of the early research; early equipment did not work very well, generated abundant false alarms, and its limitations were often not well understood by either using justice system agencies or contractors doing monitoring for those agencies.

Both the random calling (RC) and continuous signaling (CS) approaches are still in use, but additional features have been added. Early-on (late 1980s), RC was offered with breath alcohol testing. In the United States the proportion of people who admit driving while under license suspension ranges from 52% (older men) to 94% (first offenders) (Scopatz, 2003, citing other sources). Using California survey data, a speech by National Transportation

⁷ I am referring to Lawrence Singleton who cut off the forearms of his victim and left her to die although she did survive. He succeeded on parole but a decade later killed a woman in another state.

Safety Board official Danielle Roeber (2005) offers a 65% continued driving rate for suspended drivers and a 71% rate for revoked drivers. Strangely, while there is solid research showing significant impact of alcohol sensing ignition interlocks on recidivism, I have found only one study which included remote alcohol testing program as a treatment component [Lapham, C'de Baca, et al. (2007)].⁸

CS technology has also evolved. An early addition was the equipping of probation and parole officers with portable receivers that could detect signals from the body worn transmitters, so-called “drive by” receivers. These could be used to unobtrusively and efficiently determine whether offenders away from their home phones were where they were scheduled to be (e.g. at work or Alcoholics Anonymous meetings) or where that were not supposed to be (e.g. pubs). Since 2003 an ankle-worn transmitter that transdermally tests for alcohol has been available. In typical application it monitors both the presence/absence of the offender and uploads alcohol testing information to the supervising officer through the same phone-line attached receiver used for the basic CS monitoring. To date, no evaluation research on this application has been found.

Another variant of CS equipment has been used in domestic violence cases where the offender has been restricted from having contact with the victim. In this application the victim is given a receiver that generates an audible alarm and telephones the police if the offender's transmitter approaches the victim's residence. No creditable evaluations of this application have been found, although there are both lawsuits from its failures and glowing anecdotal reports of its success.

Real-time tracking of offenders using GPS began in 1997 and grew slowly for the first few years. As with CS equipment more than a decade earlier, the initial applications were plagued by equipment problems and incomplete understanding by using agencies of equipment limitations. Recently the equipment has become cheaper, more reliable, and has begun to partially displace CS equipment in the marketplace. There are three primary variants here: near-real-time tracking with exclusion zones, near-real time tracking without exclusion zones, and track logging with infrequent (e.g. daily to weekly) data uploads. In the tracking with exclusion zones application, the offender-worn (or offender-carried) device radios its location on a schedule that can range from every few seconds to perhaps hourly intervals; the tradeoff is battery life—more reporting yields more frequent battery recharges. The offender can be restricted to a certain area (e.g. home, work, and the shortest route between homes and work); leaving the permitted area results in a

⁸ The Campbell protocol excluded ignition interlocks from the protocol on electronic monitoring. Certainly this is electronic monitoring, but it does not involve daily or more frequent reporting to a supervising agency. I also discovered early-on that there was a reasonable amount of quality research being done on interlocks and that good systematic reviews had been done; it seemed unnecessary to include interlocks in the Campbell project.

violation alert being sent. The devices can also permit a large area of travel (e.g. a county) but exclude certain areas such as schoolyards, “drug corners,” or the homes of victims or witnesses. Another approach is to simply track the offender; the assumption here is that knowing he or she will be held accountable will affect the offender’s behavior. In the last couple of years agencies and vendors have realized that tracking does not always have to be real-time and that a device which simply records where an offender has been and uploads the information by modem at intervals may be sufficient for their goals.⁹ Another variant of GPS integrates offender tracks, whether real-time or delayed, with police crime report databases. This has been shown to be technically feasible and pilot studies have yielded a few cases of solved crimes as well as electronically alibied suspects, but no research has yet been done on the impact of this technology on either specific deterrence or police investigative costs. Just as RC and CS technologies improved and became more flexible, even now GPS continues to evolve. About ten years ago a psychologist acquaintance of mine approached GPS manufacturers about integrating a penile plethysmograph into their tracking equipment and found no current interest, but that was before the Jessica Lunsford tragedy that provoked a wave of harsh new laws in the United States, some of which authorize lifetime monitoring of some sex offenders.¹⁰ Because GPS monitoring cannot be used in some locations, vendors are experimenting with various radio systems to supplement GPS information so that almost no place will be excluded from coverage. When this succeeds, the use of geotracking will become more attractive and program protocols are likely to be greatly altered. Even more technology options than described above are now newly in the market or in various stages of pre-production testing. A system now on the market records body movements during sleep through a wrist-worn device. These movements are uploaded every morning to a remote computer that analyzes patterns for indications of alcohol (and other substance) abuse. I have seen demonstrations of devices that measure pupillary responsiveness, eye muscle movements, speech patterns, and tremors during writing that correlate with substance abuse. Sweat patch testing for substance abuse is now fairly routine, but experiments are being done with microelectronic capsules implanted in patches that telemeter the levels of abused substances.

Diverse program components and protocols

⁹ According to Peggy Conway, editor of the *Journal of Offender Monitoring*, the distinctions among active (real-time), passive (delayed upload), and hybrid GPS devices are becoming blurred. The current trend is for devices to contain substantial on-board processing power and to be able to upload data at almost any interval desired as well as by exceptions to programmed inclusion and exclusion zones (personal communication, May 30, 2010). Future evaluation research will need to consider not only which device was used but also to consider the details of the reporting protocols.

¹⁰ Jessica Lunsford was a 9-year old Florida girl who was murdered in February 2005 by a convicted sex offender who was on probation for a non-sexual offense.

As if being confronted by diverse populations, differing points of use in the criminal justice system, and a proliferating variety of technologies were not enough to make evaluation of EM's impact extremely difficult, the would-be evaluator must confront that programs dealing with similar offenders (e.g. addicted young burglars) at the same point in the system (e.g. probation) with similar technologies (e.g. CS monitoring) may operate very differently and produce a very different experience for the offender. Some programs see the offender daily; others bring him in for a monthly equipment check. Some divorce the human supervision and equipment installation and maintenance aspects of EM. In some agencies one employee supervises the offender and does all of the installation and maintenance tasks; in others, parts of the technical aspects of EM are subcontracted. One of the complaints in the early days of EM was that it was turning social workers into technicians, that the demands of EM were interfering with the relationship that the officer was supposed to be using to induce offender change. I have not heard this complaint lately, but I am not aware of anyone having done a time study analysis of how officers involved in EM actually use their contact time with offenders versus those not using EM. It is becoming increasingly difficult to identify the EM component of correctional treatment. In the early days one found evaluations of "EM programs" where EM was seen as the primary component. Currently, it appears, at least in the United States, to be used more prescriptively (or perhaps capriciously). Rather than everyone in a certain classification receiving a standard duration of EM, John Probationer will receive EM "because he needs it." Unfortunately, the factors that precipitated the need are not consistently described and one is often left wondering why John was sent home with EM while Harry stayed at the work-release facility when John and Harry look identical in terms of demographics and criminal history. After eight years of reviewing EM evaluations, I have become extremely distrustful of studies with matched comparison groups where some human decision-maker decided which offenders would receive EM as opposed to the other dispositions available at the same time. Although the literature on clinical versus statistical prediction routinely favors statistical prediction, I think it is dangerous to assume that all judges and classification officers are deaf and blind. I found only seven studies that attempted random assignment and only four succeeded. The best of the rest involved historical comparison groups. Most studies involve mining files (or databases) for similar-appearing offenders.

Even when EM is standardized, offenders in evaluated programs often receive a witch's brew of adjunctive treatments of uncertain appropriateness, quality, and duration. Evaluation reports typically report statistics such as "37% of the EM group were receiving drug counseling and 15% were attending Alcoholics Anonymous" without bothering to delineate the frequency or duration of attendance at either program, what precipitated attendance (i.e.

judicial assignment, classification instrument score, or volunteering), or whether the drug counselor had any qualifications whatsoever. A competent study of violent male parolees in Georgia (Finn & Muirhead-Steves, 2002) seemed to indicate no suppression effects on recidivism in the whole sample, but noted in text differentially more positive effects on sex offenders. My contact with the Georgia Department of Corrections revealed that during the EM test period, as opposed to the comparison group released earlier, Georgia was implementing the containment model but that not everyone eligible during the EM period had received either polygraph exams or sex-offender therapy and there had also been quality control issues with some of the contracted polygraphers and therapists. Thus, something may have “worked”, but the state department of corrections, the evaluators, and the meta-analysts cannot decipher what it was. Although much better than most of what came before, even the most recent and most positive studies I have seen (Padgett, Bales, & Blomberg (2006); Lapham, C’de Baca et al. (2007); Marklund & Holmberg (2009); and Di Tella & Schargrodsky (2009) do not shed enough light in this respect. Something in the “black box” worked but more research will be needed to clarify the results sufficiently so that replication can be attempted elsewhere.

The situation with respect to comparison groups is even worse than for those receiving EM. Life goes on, things happen, even if one is not on EM. Details on the treatment, supervision, and surveillance received by members of comparison groups are usually either absent or sketchily reported.

Although everyone who does research on EM’s impact faces abundant challenges and most make missteps, at least finding the research should be easy—or so I thought when I signed on to the Campbell project. I was wrong.

Finding electronic monitoring research

Every meta-analysis attempts a comprehensive collection of evaluation studies. The Campbell project is particularly rigorous in its insistence that attempts be made to capture the “fugitive” (unpublished, unindexed) literature. Past meta-analytic studies have delineated publication bias, i.e. studies which have positive findings are more likely to be published than “no significant difference” studies, and studies done by scholars at prestigious universities are more likely to be published than those done by backwater governmental agencies even if both are competently done.

To uncover this fugitive literature I wrote to all of the manufacturers of electronic monitoring equipment (24 at the time) and asked for help locating research done by users of their equipment. Two responded with studies, but neither passed my methodology filter. I wrote to all of the research directors or administrators of state departments of

correction in the United States and received a few responses but no usable studies. All major abstracts were mined, including Academic Search Premier, C2-SPECTR, Criminal Justice Abstracts, Criminal Justice Periodical Index, ERIC, CINCH, Healthsource Nursing/Academic Edition, Ingenta, MEDLINE, NCJRS, ProQuest Digital Dissertations, PsycINFO, Social Science Citation Index, Social Work Abstracts, and Sociological Abstracts. In addition, Copernic Agent Professional, a web metasearch and filtering program, was used to search the Internet; more recently I have used Google as well. For several years, the University of Toronto maintained a web-accessible bibliography on EM that was occasionally updated and which provided access to a few studies not otherwise found. My position as ex-editor of the Journal of Offender Monitoring produced a number of queries from people who were conducting research that I was able to obtain when it was completed as well as opportunities to review manuscripts.

After all was said and done, although many studies were found in multiple sources, two resources stood out: NCJRS (The National Criminal Justice Reference Service) and Criminal Justice Abstracts had indexed at least 95% of all studies found. The biennial electronic monitoring conference at Egmond aan Zee, Netherlands, sponsored by the Conférence Permanente Européenne de la Probation, provided access to many studies conducted by European, Australian, and New Zealand governments and to European administrators and scholars who have been very cooperative in supplying European research as it has been completed. Currently I have almost 900 electronic monitoring articles in my bibliography of which 152 are serious attempts at evaluation. Fewer than 20 have sufficient methodological rigor to be mentioned in the Campbell review now being prepared; probably only half a dozen will be included in the formal meta-analysis. I update my own website (<http://renzema.net>) bibliographies twice a year and will do so for at least through 2011.

What can be said about electronic monitoring research after reviewing more than 20 years of it?

Overview of trends in EM research

The early research in the United States was quite diverse in terms of objectives and methods. Between 1987 and 1995 five experiments were attempted using random assignment, but only two resulted in interpretable studies, and those showed no significant differences. Curtis (1987) was funded to do a randomized evaluation of a San Diego work furlough program, but operational difficulties halted the research. Petersilia & Turner (1991) used random assignment in a study of California probationers, but only a minority of those supposed to be on EM actually received it. Baumer et al. (1990) did a small but clean study of Indianapolis probationers, but results are less than clear because of program integrity issues. Austin & Hardyman (1991) attempted random assignment in a study of Oklahoma parolees, however the treatment and control groups were not prequalified on the availability of telephones (so some of the experimental group was denied EM) and follow-up periods for the two groups were different. Of the five early attempts at random assignment, only Baumer et al. and a small study done in Georgia by Erwin (1987) as part of the larger Rand Corporation study of Intensive Supervision Programs are likely to be reported in the Campbell meta-analysis. Not until a Swiss study done in 2005 (Villetaz & Killias) did another randomized study appear; it was followed in 2007 by Lapham, C'de Baca et al.'s study of recidivism of drunk drivers who received a variety of dispositions, including electronic monitoring. Although not randomly assigned by the researcher, the procedures by which Di Tella & Schargrodsky's (2009) Argentinean offenders were assigned appear to have achieved randomization as well.

The bulk of evaluation studies did not involve comparison groups, and those that did match were often clearly inadequate in the quality of the matches. Evaluation objectives of studies have varied widely. Early studies in the United States often did exit interviews of monitorees to try to gain a qualitative understanding of the experience of being on EM. The same thing happened in Europe, Australia and New Zealand about a decade later as EM began to gain support as a sentencing alternative. Some studies focused on survival without revocation to the end of the monitored period while others looked at recidivism after release from monitoring, but usually only for a short period. Very few looked at both, but they should have if one is to understand the overall impact of EM. Notable exceptions to the typical six-month to two-year post-EM follow-ups are the four-year follow-up reported by Finn & Muirhead-Steves (2002) and three years of Jones & Ross (1997), however the latter study had both program definition and matching problems. Gainey et al. (2000) did a study of a mixed group of traffic, misdemeanor, and felony offenders with mixed amounts of jail and electronic monitoring that were followed for five to twelve years, but there was no comparison group. In many studies there is an issue of dosage; just as one would not look at the five-year survival rates of lung

cancer patients who had been given a single aspirin, it seems unreasonable to examine long term success rates of monitorees who have experienced it for a few days or for whom durations were not reported. Many studies report average durations but when one looks closely one finds that some offenders experienced only a few days (and not because of violations) while others experienced multiples of the average. Juvenile populations are particularly treacherous in terms of variability of duration.

While the volume of EM evaluation in the United States slowly declined until a recent upturn, studies seem to be improving in quality. Table 1 shows the volume of studies by five-year periods since the first article tagged in my bibliography as a program evaluation appeared in 1986. Purely descriptive articles and review articles were not included.

TABLE 1
NUMBER OF EM EVALUATION STUDIES COLLECTED PER FIVE-YEAR PERIOD

Period	Number of Articles
1986-1990	37
1991-1995	36
1996-2000	34
2001-2005	23
2006-2010 (May)	30

Over the last ten years, in the United Kingdom the Home Office Research Unit has done a number of competent studies that have shown no significant impact on recidivism. A general issue with the Home Office studies is the relatively brief duration of monitoring and, in most cases, lack of adjunctive services.

The more recent studies often attempt to deal with the problem of equating comparison groups through multivariate techniques. This is not always an advantage: although statistical risk of recidivism may indeed be the same, there may be qualitative differences in groups that make the EM group more or less responsive to EM than the compared group would have been. Given all that has been said above concerning difficulties of EM research, it is time to take a look at the first three of the empirical questions listed at the beginning of this chapter.

Where we are now on the “empirical questions”?

1. *Does EM affect recidivism after EM has concluded?* If one looks at only reasonably clean studies that had comparison groups, i.e. the core of the Campbell Collaboration protocol standard, the answer has to be, “if at all, probably not much.” Evan Mayo-Wilson and I excluded low-risk offenders and juveniles and analyzed part of the Campbell EM studies on the premise that if EM “worked” it was likely to work best with higher risk offenders (Renzema & Mayo-Wilson, 2005). We considered 12 studies but included only the three cleanest [Bonta, Wallace-

Capretta, & Rooney (2000), Finn & Muirhead-Steves (2002), and Sugg, Moore, & Howard (2001)] in calculation of an odds ratio that turned out to be 0.96 ($p=.82$), just slightly favoring the EM groups but nowhere near significance or practical importance. Not included in the article were other analyses that included all of the studies, clean and dirty, all risk levels, and juveniles; those results were about the same. Our reported findings were clearly not simply the result of obsessive rigor in study selection.

Over the decade from 1991 to 2001 using other criteria for study selection none of the systematic reviewers or meta-analysts found different results [Corbett & Marx (1991), Mainprize (1996), MacKenzie (1997), Schmidt (1998), Gendreau et al. (2000), and Whitfield (2001)]. Despite the overall lack of impact, in some studies there were hints that EM combined with other elements might make a difference. Bonta, Wallace-Capretta, & Rooney (2000, p. 324) found that compared to imprisoned offenders of the same risk levels, high risk offenders receiving a combination of EM and cognitive behavioral treatment recidivated less; in contrast, lower risk prisoners did better than those receiving the same combination of treatments. As noted above, Finn & Muirhead-Steves (2002) found better results for sex-offender parolees. Their whole group found that 23.4% of both violent male parolees and the historical comparison group returned to custody within three years. For sex-offenders released in the control period, 29.6% of the 44 studied returned; during the EM period only 5.7% of 35 returned. In neither case can it be claimed on the basis on published results that EM made a critical difference, however the results are suggestive in themselves and also suggest that future evaluations of EM should be much more focused. If positive results are to be found, they will be found by studying carefully defined homogeneous populations receiving carefully defined treatments directed at reducing specific risk factors. In other words, we should be using rifles, not shotguns, as we try to target EM's effects.

Just in the past year two studies have appeared that suggest long-term recidivism reduction. Di Tella and Schargrodsky's 2009 manuscript described the impact of electronic monitoring in Argentina's Province of Buenos Aires. They compared the eventual recidivism of 386 people who had experienced EM with 1152 matched offenders released at the same time (± 6 months) over a ten-year period. Most of the EM people were pre-trial, but so were the bulk of those imprisoned. Unlike most EM programs, there were no restrictions on the crimes of which the EM candidates were accused. In both the EM and matched prison samples, for example, seven percent were accused of homicide. There were many unusual circumstances—at least to a North American reader—about Argentina's criminal justice system—from the assignment of cases to judges, to lengthy pretrial detention, to the nature of the prison experience. In the end, 22% of the former prisoners recidivated while only 13% of those who had experienced EM did.

The period at risk was very variable, but at least the EM participants were exposed for the same length of time as the prison releasees. For reference, first year recidivism was 7.1% for the EM group, 10.5% for the prison group.

Another recent study is exempt from the “shotgun approach” criticism. Marklund & Holmberg (2009) followed for three years after release the reconvictions of matched groups of Swedish EM early-prison-releasees and convicts released at the end of their regular terms. Although it was essentially a “salvage evaluation” in that there were some non-EM offenders released during the EM operation period, they took great care in their analysis to show that selection was not impacting validity. Unlike most studies, they tried to ascertain not only that EM had “worked” but upon whom it had impact. Table 2 summarizes their results. It is noteworthy that EM appeared to have its greatest impact on mid-range offenders, whether indicated by the agency’s risk score or by number of prior convictions. Older offenders responded better than younger offenders.

TABLE 2
THREE-YEAR RECONVICTION OUTCOMES BY THREE MEASURES
OF RISK IN MARKLUND AND HOLMBERG’S STUDY

TRICHOTIMIZED RISK	Early Releases on EM [†] N=260	Control (Normal Term) N=260
Low	10%	24%*
Medium	27%	42%*
High	44%	49%
PRIOR CONVICTIONS		
0	12%	21%
1-2	24%	43%**
≥2	60%	66%
AGE		
≤37	36%	44%
>37	17%	32%**

[†]Rounded to the nearest percent * p<.05 **p<.01

SOURCE: Marc Renzema, *Rationalizing the Use of Electronic Monitoring*, *Journal of Offender Monitoring*, 2010, Vol. 22, No. 1, pp. 5-11.

Although the results are impressive, I suspect that the generalizability is somewhat limited given the umbrella of Sweden’s employment, housing, social, and medical services available to both the EM and control groups.

The flaws in the reviewed research suggest that much greater attention to both program delineation and program integrity must be done than has been done up to now. Users of EM have known for at least 20 years that it is not a panacea, yet when research is done it still typically uses a shotgun approach (a great diversity of offenders and a mélange of ill-defined treatments) as opposed to the more appropriate sniper rifle (single population, defined treatment, careful program delineation).

2. *Does EM affect offender criminal behavior during the monitored period?* For some years the Florida Department of Corrections has been publishing statistics in its annual reports and occasional special reports showing that offenders on electronic monitoring are returned to prison less often than other offenders under Community Control. Given incomplete information on group comparability, it was impossible to be sure whether this was due to the impact of EM, EM plus other programs, or simply the assignment of lower risk offenders to EM. A study by Padgett, Bales, and Blomberg published in February 2006 clearly disposed of the idea that lower seriousness offenders were receiving EM; in fact, offenders receiving EM were significantly more serious. The study was much larger than most with a total of 74,276 subjects. In a statistically sophisticated analysis based on the records of offenders under home confinement without EM, those with CS monitoring, and those with GPS monitoring, Padgett et al. concluded, “. . . offenders on [CS] monitoring are 95.7% less likely and offenders on GPS monitoring are 90.2% less likely than offenders on home confinement without EM to be revoked for technical violations” (p. 79). For new offenses, the reduction was 94.7% for both types of monitoring. Although fairly long and complicated, the article is destined to become a classic and deserves study by anyone involved with monitoring. Among other points made are that CS is not necessarily superior to GPS as the two technologies have been applied to somewhat different kinds of offenders. The article also makes the point that net widening appears to have occurred for drug offenders but not property or violent offenders. The article is not perfect; it is essentially a “black box” evaluation that does little to delineate process. It is not clear whether some of the failures in the non-EM group are people who were removed from EM, i.e. group cross-over may or may not have occurred.

In their 2010 report Bales, Mann et al. took a second dip into the Florida data with sophisticated analytic techniques as part of a National Institute of Justice funded study (*A Quantitative and Qualitative Assessment of Electronic Monitoring*) and formulated five primary conclusions for the quantitative section of their report.

1. EM reduces the likelihood of failure under community supervision. The reduction in the risk of failure is about 31%, relative to offenders placed on other forms of community supervision.
2. GPS typically has more of an effect on reducing failure than RF [*same as CS*] technology. There is a 6% improvement rate in the reduction of supervision failures for offenders placed on GPS supervision relative to offenders placed on RF supervision.
3. EM supervision has less of an impact on violent offenders than on sex, drug, property, and other types of offenders, although there are significant reductions in the hazard rate for all of these offense types.
4. There are no major differences in the effects of EM supervision across different age groups.
5. There were no major differences in the effects of EM for different types of supervision. (Bales, Mann et al. (2009), p. x)

That these conclusions are a little different from the earlier report probably reflects the evolution of the Florida's monitoring program, improvement in GPS technology, and a differences in the samples used. In the second report a majority of the offenders were on "Community Control" which is generally seen as a prison diversion program for offenders not manageable on probation. Other significant groups were felony probationers, conditional releasees from prison, and sex-offender probation: in short, a very risky and high crime-severity group when compared with how EM is used in most U.S. jurisdictions.

A much more homogeneous group was studied by Lapham, C'de Baca et al. (2007): recidivist drunk drivers in the northwest of the United States (specifically, Oregon). They randomly assigned 477 treated recidivist drunk drivers to four different treatment conditions. All groups received intensive supervision that included alcoholism treatment and polygraph testing (hereafter, *ISP*). The base group received nothing else. The EM group received a relatively short period of EM that included both CS curfew monitoring and in-home remote alcohol testing. A third group received forced sale of their car(s). A fourth group received both EM and forced vehicle sales. They tabulated hazard ratios for risk of arrest at three months, one year, and three years after intake. The results are fairly clear at the three-month point but quickly dissipated: at the end of three years the group that had received only *ISP* was doing better (fewer arrests) than the others. But what is interesting here is the three-month result. For the fourth group (all possible treatments) the risk was lowest. For the EM group the risk was twice as high as the "everything" group. For the "forced sale group" the risk was four times higher. For the *ISP*-only group the risk was three times higher. In other words, at the three-month point EM was the most potent single addition to the basic *ISP* protocol.

For the moment, this is the best evidence of a surveillance effect depressing both technical violations (rule breaking and absconding) and new offenses for the duration of monitoring. Prior work on suppression effects has been largely ambiguous because of group equivalency issues. As survival analysis becomes more commonly used it should become clearer whether the Florida findings replicate or are anomalous.

3. *Does EM have positive or negative impacts other than those on offender criminal behavior?* In other words, does it help or hurt the employment, psychological health, or social relationships of the offender or those around the offender? Some systematic work has been done on these issues and I will highlight a few of the findings of the better studies. The earliest I found that dealt with this issue was a monograph from North Texas State University (1987). Its sample of 18 received the Beck Depression Inventory [BDI] and the Family Environment Scale [FES] before being placed on EM. Although the BDI scores for those who became absconders indicated slight depression as

opposed to normal values for those who did not, the differences were not significant. Most of the ten subscale scores on the FES were close to normal both before and after EM. One scale statistically distinguished program completers from absconders: cohesion. The authors suggest screening before placement on family cohesion as, “potential . . . clients whose family environment is perceived by them as providing a low degree of help and support . . . are much more likely to abscond from the program prior to completing it than are those potential clients with normal or above scores.” Family cohesion during EM declined somewhat from above normal levels to normal levels.

The North Texas study authors expanded their work with data collected in 1988 and 1989 at three locations in Texas from both probationers and parolees (total n=261). Each status had an EM and a non-EM group; all information was obtained from volunteers. All groups were given pretests and posttests on both the BDI and the FES. In brief, the parolees were less dysphoric than the probationers and the EM-parolees were the least dysphoric of all (Enos, Holman, & Carroll, 1999, pp. 188-189). In all groups family conflict and dysphoria were correlated; probationers registered higher levels of dysphoria and conflict than parolees. Comparing pretest to posttest measures, family control declined in all groups, but significantly more in the EM groups than the non-EM groups. The authors explain, “These results imply that EM may serve to relieve the family of some of its control responsibilities. This may explain the decline in dysphoria since the replacement of controls associated with the family by correctional authorities (i.e. EM) provides the offender with a highly structured lifestyle but keeps the responsibility for its imposition outside the family unit. Thus, the effects of EM may well be beneficial for the offender as well as for the family with which he/she lives.”

Sandhu, Dodder, & Davis (1990) administered an open-ended questionnaire to 156 southwest United States parolees on EM house arrest and compared the results with the responses of 63 residents of a Community Treatment Center (CTC). They found those on EM reported fewer adjustment problems than those in the CTC and that they resolved problems more rapidly than those living at the CTC. Perceived sources of support were somewhat different. Noteworthy is that when asked about leisure time activities, “one-fourth of house arrestees said they were simply doing time” (p. 153) which implies boredom and resentment. One is left asking whether it was that particular program or the nature of EM in general that led to this perception. Reports of family problems were rare in both groups. Twice the percentage of those on EM reported “good things” happening involving family as those at the CTC.

Mainprize (1995) conducted open-ended interviews with 60 people on EM in British Columbia during an EM pilot project, apparently in 1988. He interviewed volunteers who understood that if it had not been for EM they would have been jailed. Time spent on EM was short with an average of 22.7 days and most were interviewed while still on

EM. Mainprize calls attention to a number of situational factors that could have distorted responses; most can be characterized as incentives to make the experience appear more positive to the offender than it might have been. It is impossible to concisely summarize a long and detailed article that comprehensively dealt with the impact of EM on the offender and the offender's relationships; however I will note a few of the more positive and negative findings. To the question of whether EM "had in any way affected, changed, improved or worsened relationships with the person with whom you live", of those residing with others 52% saw no effect while 20.8% saw improvement and 6.2% saw worsening. EM was seen as interfering with family activities to some extent. Although 35% saw no effects on social relationships, 50% reported a general reduction. Feelings of social isolation were reported by 16.6%. Physical activities were most affected (75%) but "social activities with friends and coworkers" were a close second at 73.3%. Multiple coping styles were observed; some became sedentary, others used the new-found time productively. A sixth of the offenders used social isolation as a way of concealing their EM status from others, a strategy that may have been viable given the short durations of EM. "Minor effects" at work were experienced by 49% of the employed offenders while 9.8% reported significant effects. The inflexible schedules mandated by EM seemed to be most disruptive, but limiting of socialization and feeling that the EM status needed to be concealed were also reported. Most offenders, 80%, attempted to conceal EM status to at least some people, with coworkers being the people from whom the offenders most wanted to hide their status. Probably the clearest endorsement of EM was the preference of most for accepting EM again if it were offered after another offence. No one said "no" and only a few were unsure; most saw it as a bargain. In terms of how they felt about themselves, 60% were coded as "better", 35% as "no change" and only 5% "worse".

Mainprize summarizes the effects on others in the workplace as, "The indirect evidence suggests that EMS [*electronic monitoring*] program status has largely minor (and mostly manageable) effects on the work settings of offenders" (p. 171). In terms of spousal and family roles, 10% reported being negatively effected "mainly from reports of not being able to participate with the spouse in social activities beyond the home" or being able to supervise children to the extent needed. In total, despite being on a very early group of monitorees who were monitored for a very short period and who agreed to interviews, Mainprize's work is significant because it found significantly different individual reactions to the EM experience but nothing that suggested general harm from the experience to either offender or the offender's relationships. Many of the negative impacts could have been reduced by better program management.

As part of an evaluation of the New South Wales Home Detention Scheme, Heggie (1999) mailed an exit survey to 140 people leaving EM; only 65 were returned. The most disruptive aspect of EM was reported to be the monitoring calls which ranged from 5 to 18 calls a day, obviously not a feature of all monitoring protocols. Only 8.1% of the respondents reported “no disruption” to their normal routine/lifestyles while 22.6% found the calls “very disruptive” (p. 89). On a question about positive aspects of the experience, 90% of those responding checked “interaction with family” (p. 91).

Gainey & Paine (2000) administered a 24-item survey to 49 offenders on EM in Virginia. Some were given in face to face interviews, others by phone, on-site written administration, or mail. Response choices were: “1=no problem”; “2=a little problem”; “3=a moderate problem”; and “4=a very big problem” (p. 87). Questions were drawn from the literature, qualitative interviews with other offenders, and “insights from administrative staff” (p. 87). Responses were grouped into the dimensions of privacy issues, shaming issues, disruptiveness, social restrictions, and (restrictions on) drug use (p. 89). The most onerous aspect ($M=2.51/4$) was “social restrictions”, i.e. not being able to exercise, run errands, meet friends, and eat out. Also high were “shaming issues” at $M=2.12/4$, i.e. “having to tell friends you can’t go out”, having to explain to friends or family, “having to wear a visible monitor.” Close behind were work problems ($M=2.02/4$) centering on not being able to do overtime and having to receive law enforcement phone calls at work. Although the authors were looking for the negative and/or punitive aspects of EM, they also asked open ended questions and found that the perception of the majority was that EM “was positive, at least in comparison to jail”(p. 88). Associations were tested between demographic characteristics and dimension scores; the only significant association was that women and married men tended to view shame as more of a problem than others.

Maidment (2002) interviewed all of the 16 available women who completed a Newfoundland EM program and compared their responses to those from a random sample of 16 men who had been on EM. This qualitative study made clear that the women, mostly single mothers with young children, were having a much more difficult time coping with the demands of EM than the males were. Everything from having other people available to run errands and do shopping seemed less complex for the men, most of whom lived with other people, than for the more isolated women. Even when there was a male in the house, women on EM found themselves disproportionately burdened with housework and childcare by virtue of the EM status. Maidment remarks, “A rather surprising response from a number of women on EM was that, in hindsight of program completion, they felt that, compared to prison, ‘serving their time at home’ was more difficult as they experienced increased stress while being responsible for more tasks with little support.

Clearly, these women felt that had it not been for the presence of their children in the home, they might have preferred to serve their sentences in prison as opposed to home confinement. This was due, in large part, to the dependencies EM created for women on their families, spouse, social service agencies, friends, and correctional personnel" (p. 60).

A small New Zealand study by King & Gibbs (2003) echoes Maidment's conclusion. Although the study interviewed 14 male and 7 female offenders on EM, it also interviewed 21 sponsors of people on EM (often female partners of men on EM), probation officers, security managers, and prison board members. Whether as detainees themselves or as sponsors of males on EM, women appeared to be more burdened by EM than men. The female monitorees were more subject to the shame of the anklet. They tended to ask for more support from the correctional agency. Those that undertook the sponsor role often did it for the sake of their children. Many experienced tension in their relationships they attributed to being on EM or having an EM offender in the house; they reported more arguments than males on EM.

Two recent studies from the United Kingdom [Hucklesby (2008), and Hucklesby (2009)] are largely congruent with those cited above.

The 2010 Bales, Mann et al. study breaks some new ground, particularly on the issues of stigmatization and employment problems with GPS tracking. Given the widespread publicity in the United States about pedophile abduction/murders and harsh new laws that authorize lifetime GPS tracking in some states, the meaning of "being on GPS monitoring" seems to be changing in the public perception. If formerly it meant that someone had gotten into a bit of trouble, it now seems common—as one interprets the Florida interviewees comments—for people to assume that the offender is dangerous and quite possibly a sex offender. The Bales, Mann, et al. study interviewed 105 offenders and found substantial problems related to relationships and finding and keeping employment. Roughly half of the offenders experienced at least some negative impact in each of three areas of relationships: spouses/significant other, their children, and friends (p. 92). Sixty-one percent of the interviewees "stated that EM did affect their ability to obtain employment" (p. 94). Twenty-two percent reported being fired or being asked to leave a job because of EM (p. 95). Part of the problem seems to have been that the devices in use were two-piece units that could not be easily concealed, but operational requirements (e.g. having to go outside to expose the GPS unit to the sky when tracking was lost) also interfered with both employment and social relationships. I expect that technical improvement, increasing miniaturization of GPS equipment, and integrating GPS with ground-based location technologies will eventually reduce

the social and employment problems, but for the moment they are quite significant. Offenders wearing future generations of GPS equipment may react differently to the experience—necessitating continuing research.

What can be concluded about the impact of EM on offenders and those around them? For most offenders, but particularly for those for whom it is a clear alternative to prison, it is seen as either beneficial or innocuous. There are problems for both offenders and those in their households; for the most part they are minor. Many of the small problems could be reduced by using more appropriate technologies and by more flexible program management. My view is that society does not owe offenders stress-free lives, but that any stresses society imposes need to be manageable. For some, particularly single mothers and those who are depressed at the outset, there is reason to be wary of using EM without assessing the whole situation of the offender and his or her family.

Conclusions

I have not dealt with financial impact of EM on correctional systems or with net-widening which are, of course, interrelated. There is some research on these subjects, but much more needs to be done. I have also not dealt with the consequences of extremely long duration EM for sex-offenders now authorized in several jurisdictions: no one knows how offenders will react to monitoring that extends into decades. Despite the good intentions of many of those who founded and who were early adopters, EM is now mainly about punishment on the cheap, not rehabilitation. Yet, in the attempt to deter and punish humanely and inexpensively, most users of EM are not even trying to use it a tool for rehabilitation. Better planning and record keeping would add little to the expense of using EM but might have great benefits in terms of producing better payoffs. In particular, users need to target:

- Offender characteristics beyond simply including and excluding certain classes of crimes; both psychological characteristics and characteristics of the offender's environment are relevant.
- Transparency of the selection process for EM in order that usable comparison groups may be found or created.
- Support and treatment services that would be needed for those on EM so that the demands of EM can be managed.
- Program monitoring; for example, rather than "drug counseling" evaluators need to know how much and by whom.
- Careful recording of violations and new offenses both during and after EM, preferably for at least three years.

- Equivalent record keeping for offenders receiving whatever disposition is the alternate (or predecessor) to EM.¹¹

We should know more about the impacts of EM than we know now and, if we are responsible and humane, we will focus on doing quality research on the issues outlined above.

¹¹ Readers may examine the Campbell EM code sheets available at <http://renzema.net> for more guidance and operationalization of some of the of the key pieces of information that are needed to assure comparability among research studies.

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