

I. COVER SHEET

Electronic Monitoring's Impact on Reoffending

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II. Background for the Review

A. *From where did the problem, approach and/or intervention come?*

In the 1960s, a group of Harvard researchers focused on the development of medical telemetry and tracking systems. Psychologist Ralph Schwitzgebel, a member of the group, foresaw that the equipment (then composed of two units 6 x 3 x 1 inches each and weighing two pounds in all) would be miniaturized and that it would be, “. . . possible, with the addition of special security equipment, to use the system as an alternative to the long-term incarceration of certain types of chronic recidivists” (Schwitzgebel 1967).

Although experiments were done in the mid-1960s in Cambridge, Massachusetts, which involved real-time tracking of a few volunteer offenders in an area limited to a few city blocks, the experiments were eventually abandoned. Schwitzgebel did write extensively on how such equipment might be effectively used and envisioned the equipment as an adjunct to therapy as well as a means of enhancing accountability.

Ever-climbing prison costs and populations, as well as dissatisfaction with results of incarceration, led in the 1970s to exploration of a variety of alternatives to incarceration. Although house arrest has been used from biblical times, the implementation of formal home confinement programs in many American jurisdictions in the 1970s was seen as innovative. Commercial electronic monitoring (hereafter EM) equipment was not available until the early 1980s, so it is clear that the concept antedates the technology (Lilly and Ball 1987). These programs were generally presented as cheap, humane, and safe alternatives to prison that nevertheless delivered some deserved punishment.

When EM equipment emerged, the combination of prison crowding, media exposure, and manufacturers’ sales efforts resulted in an explosive growth of the use of equipment, from a daily census of 95 offenders in 1986, to 6490 in 1989, to roughly 80,000 to 100,000 currently (Renzema and Skelton 1991). Today the vast majority of offenders on EM (all but about 2,500) are on what may be best described as “curfew checking” systems, equipment that establishes whether or not an offender is at a fixed place at a specific time. The remaining offenders are on Global Positioning System tracking that can report offender locations to an agency as frequently as every minute, but even this falls far short of Schwitzgebel’s more than 30 year-old vision of a tracking/feedback system that would be used as a therapeutic adjunct.¹

¹ Two other families of equipment emerged in the 1970s: remote breath alcohol-testing equipment and alcohol-testing ignition interlocks. The former is clearly an add-on to conventional “curfew checking” equipment and will be included in studies reviewed if any relevant studies can be found. So far, none have been. Ignition interlocks could be classified as an “electronic monitoring” intervention or as part of the equipment for drunk driving or alcoholism interventions and, as such, could be the subject of another C2 review or a Cochrane review. In general, the ignition interlock studies appear to be both methodologically better and the outcomes more promising than the other EM studies. However, they will not be reviewed in the EM review absent instructions from the protocol review committee; several excellent studies of interlocks have found relatively small but significant impacts on DUI reduction during the period in which

The lead reviewer's examination of equipment vendor and monitoring service sales materials at a recent workshop for European users of EM suggested five primary purposes, not explicitly including rehabilitation, for the adoption of EM.²

- EM could control correctional costs by helping to avoid the construction/operation of new prisons
- Offenders would suffer less stigmatization by being placed on EM instead of being sent to prison³
- The public would be safer because non-compliant offenders would be caught more quickly before they could do much damage
- General social costs could be reduced because offenders could continue to support their dependents and to pay taxes
- Offenders could avoid being victimized by the prison experience

There were a few references to interrupting crime cycles, opportunity blocking, and reducing peer influences—ideas that will be considered in the theory section below—but these certainly were not primary reasons for agencies being urged to adopt or expand EM.

B. Debates on the utility of the intervention

Even before monitoring equipment became commercially available, scholars had serious reservations about the prospect of EM. Ingraham and Smith understood the invasions of privacy and restrictions of freedom it would bring but believed that the consent of the monitored and a flat ban on the use of obtained information in prosecutions would provide adequate protection for convicts diverted from prison (Ingraham and Smith 1972). Neither caveat has been totally respected in practice.⁴

interlocks have been installed. A third technology, polygraphy, is not addressed in this review although it has been used with apparent success in community management of, in particular, pedophiles.

² EM Workshop sponsored by the Conférence Permanente Européenne de la Probation (Egmond aan Zee, Netherlands, May 10-12, 2001).

³ Implicit here, of course, is an acceptance of labeling theory supposition, and perhaps that of differential association, that any deterrent effects of imprisonment are more than counterbalanced by its negative social and psychological effects.

⁴ Invasions of privacy and restrictions of freedom affect both the offender and those in the offender's residence. For systems using ordinary telephones, short conversations are usually mandated for all in the household and conversations may be interrupted by line seizures by EM equipment. Optional features such as answering equipment and call forwarding are banned. Visibility of both body-worn and residential equipment potentially affects the social life of both offender and housemates. There is the potential of avoidance of the offender and his or her family because of stigmatization as well as avoidance by criminal friends who understand that the offender is under surveillance and who sometimes overrate EM equipment capability and believe that the simplest equipment offers real-time tracking and audio surveillance. For these reasons consent is usually sought by the monitoring jurisdiction from both offender and the others in the household. As for use of information, prosecutions and revocations are frequently triggered by location and substance abuse data initially obtained through EM.

When compared to the restrictions of incarceration, EM's intrusiveness is relatively benign, but others soon questioned whether prison should be the reference point. Although the debate continues, most studies of the net-widening⁵ effects of alternative sanctions have found that some offenders are, indeed, placed in the community who would otherwise have been imprisoned but that others are subjected to more intrusive control (and thus implicitly a higher risk of removal from the community because of program failures) than would otherwise be the case (Jackson, De Keijser et al. 1995).

Corbett and Marx's (1991) list of ten "technofallacies in the electronic monitoring movement" critiqued EM on both theoretical and empirical grounds. Subsequent experience suggests they were correct in questioning whether EM programs "are developed for their declared purpose and/or that there is a clearly developed purpose." Certainly one effect of EM has been, as they suspected it would be, to make "liberal" probation palatable in a conservative era. EM programs are, like many other sanctions, supposed to punish, deter, reintegrate, and rehabilitate simultaneously. This is a tall agenda and one where daily practice often does not coincide with stated goals.

Perhaps most damning of Corbett and Marx's criticisms was that EM had "intuitive appeal and surface plausibility" that led users to ignore empirical data that it was not diminishing crime or even necessarily cutting costs. Even as EM was experiencing exponential growth, the studies they reviewed suggested crime control impact was not being achieved and that cost-cutting was in doubt because of the possibility of net widening.

Corbett and Marx christened another problem the fallacy of "quantification." Its essence is that both line staff and their managers may prefer the relatively simple, measurable tasks of EM to the more complex, taxing, and skilled task of casework. The implicit argument is that EM—of undemonstrated utility—could divert agencies from empirically-based effective treatment.⁶

Although Corbett and Marx make other reasonable criticisms, the last one considered here is what they called "the fallacy of the sure shot." They contend that program developers assume interventions would "reach their intended target with laser-like precision—the public policy equivalent of a surgical strike." Both the research literature and the agency folklore on EM are rich with accounts of judges giving programs "gifts they can't refuse"—clients clearly outside the program design parameters. Corbett and Marx argue that both program administrators and judges

⁵ Clear and Cole (2003) define net-widening as "increasing the scope of corrections by applying a diversion program to people charged with offenses less serious than those of the people the program was originally intended to serve." In other words, if EM is implemented in a jurisdiction as a means of reducing prison crowding but evidence shows that most monitorees were not prison-bound, then "net-widening" has occurred. In practice, "net-widening" refers to both more harsh dispositions (as in this example) and to the expansion of the total offender processing capacity of a jurisdiction.

⁶ An EM-using agency can, for example, easily display a printout of offender compliance with monitoring conditions. Producing evidence of long-term rehabilitation is much more difficult and the agency may drift toward claiming the easy victory.

particularly tend to oversupply less serious offenders for which EM is less defensible and exclude the higher risk offenders which programs often intend to divert from incarceration.

Mainprize's review (1996) of the history of EM argues that although Schwitzgebel had rehabilitation in mind, the forces that produced the boom in EM that started 13 years after the end of the Harvard experiments had nothing to do with rehabilitation. Instead, the enabling conditions stemmed from "political economies of fiscal crisis and restraint, technologies of remote communication and control," [ideologically driven punitiveness,] "and the accumulated systemic consequences of severe prison overcrowding." In terms of this protocol, this is a clear challenge to using measures of rehabilitation as primary indices of success. If the purposes of EM are saving money, keeping offenders under control, and limiting prison crowding, then it becomes very important to look for evidence of crime suppression during EM as well as after its end.

The critiques cited above suggest that although not as punitive as prison, EM is not innocuous. It is intrusive. Several exit interview studies suggest that offenders see EM as quite punishing. EM may cause more offenders to be punished and may cause more severe punishment of some offenders. By virtue of system expansion and incarceration of program failures, EM's ability to reduce costs may be considerably overrated. Is there at least evidence of reduction of reoffending to counterbalance these concerns? The evidence is unclear and mixed.

Corbett and Marx's 1991 analysis found no evidence of impact. The seminal "Preventing Crime: What Works, What Doesn't, What's Promising" study done by a University of Maryland group in 1997 reviewed two EM studies which had used random assignment and found no recidivism reduction. "Home detention with electronic monitoring" was assigned to the "what doesn't work" category (MacKenzie 1997). A 1999 report from Sweden contained a three-year follow-up for those who participated in the beginning of its Intensive Supervision with Electronic Monitoring (ISEM) program. The ISEM group experienced a 26% relapse rate compared to a 28% relapse-into-crime rate for a "corresponding" group who served their sentences in prison. The English abstract states, "A cautious interpretation might be that ISEM as an implementation procedure does not generally affect the convicted person's tendency to reoffend" (National Council for Crime Prevention (BRÅ) 1999). A two-year follow-up of 261 English offenders who had received EM "curfew orders" showed a 73% reconviction rate, not significantly different from the 74% reconviction rate for a matched group that received community service orders, the disposition that would have been given most had EM curfew orders not been available (Sugg, Moore et al. 2001). A recent meta-analysis of 140 studies of sanctions by Gendreau, Goggin, Cullen, and Andrews (2000) included six studies of EM and a total of 1414 offenders. The aggregated EM recidivism was 6%, the comparison groups 4%.

In short, the utility of EM has been and continues to be questioned, and not only on the issue of its impact on recidivism.

C. *Role of theory*

Although one can argue potential positive and negative impacts of EM on offender behavior based on a number of theories, the utilization of EM largely evolved—despite the early Harvard experiments—from correctional agencies seeking common-sense solutions to ever-so-urgent problems of costs, capacity, and control. Entrepreneurs understood these problems and adapted electronics developed for other purposes, and an industry was born. In the early years agencies frequently adopted EM while the technology was still barely functional. In many places, enthusiasm for the quick-fix preceded a thorough study of whether or how EM could work in their environments.

Despite its widespread adoption by administrators whose analysis probably did not reach beyond classical theory (if any theory at all), theories are relevant as one selects criterion variables. Unfortunately, making predictions of the impact of EM based on theories implies an understanding of how offenders react to EM—which is, of course, not the same for all offenders. For some it may be a temporary annoyance, for others a badge of status, for yet others a humiliating and disruptive experience, and for a few a welcomed intrusion that provides a vehicle for ending a chaotic and unsatisfying lifestyle.

The impact of EM should also depend on agency operational policies and accompanying programs. Some operators use EM to set time and place limits and provide infrequent contact (if any) with a caseworker. Others try to use it to control associations and to coerce treatment attendance. This said, there are some theoretical orientations that are particularly, but not universally, relevant.⁷ Rather than attempting a comprehensive discussion, only the most obvious will be noted here and only to make the points that different theories lead to different predictions of EM's impact on reoffending and that theories provide some clues as to the conditions in which EM might be able to reduce reoffending.

Labeling theory, social learning theories, classical theory, rational choice theory, routine activity theory, and control theories appear to be most relevant to the issue of reoffending.⁸

D. *Conflicting predictions*

One of the early academic complaints about EM was that the hardware (ankle bracelets or wristlets) would stigmatize those monitored thus allowing others to identify them as people to avoid and possibly contributing to the internalization of the deviant

⁷ One recent criminology text breaks criminological theory into six major groups and 30 distinct theories—and it is not exhaustive. Ellis, L. and A. Walsh (2000). *Criminology: A Global Perspective*. Boston, Allyn and Bacon.

⁸ Other theories (for example radical-critical, postmodernist, and feminist) could be used to explore the attractiveness of EM to the agents of social control, discriminatory selection of offenders to be monitored, and issues of cost-effectiveness after net-widening.

self-image—the latter being a key tenet of *labeling theory*.⁹ This is arguable if the compared group is those receiving probation without EM. However, if EM is compared to incarceration, EM should emerge as the less stigmatizing, less criminogenic sanction.

The varieties of *social learning theory* also lead to inconsistent predictions. To the extent that EM is used to disrupt contacts with people with criminal values and criminal skills (whether in prison or in the community), reoffending might decline. Simply keeping an offender away from crime for a time could, in theory, lead to extinction of the behavior. Success would be more likely if alternate values or means of gratification were taught in the interim or if pro-social peer groups were found while on EM. It appears that the social learning approach would generally not predict any impact for a brief period of EM unaccompanied by other program components.

Longer periods of EM paired with treatments focusing on associations, skills, and values might have a positive effect. Potentially negative impact could occur if EM is used to force people to stay in situations which reinforce criminal values or skills, for example the homes of some juvenile delinquents or a community correctional facility with a prison-like culture. To the extent that post-EM offenders re-enter the environment in which their criminal behaviors were originally learned, one would expect that any post-EM gains would gradually extinguish.

Classical theory and *rational choice theory* assume that offenders calculate the rewards and benefits of potential crimes based on probabilities of benefits and vulnerabilities. To the extent that calculations are accurate and offender ratings of the aversiveness of the consequences of violations are high and consistent, EM should be able to suppress crime during the monitored period. Unfortunately, perceptions are not always accurate, the gratifications of substance abuse are not equal to all abusers, and the conditional liberty of EM is far more valuable to some than others. Further, theories based on offender rationality do not predict the durability of EM's effect: presumably as EM ends the offenders will understand that their vulnerability declines and the probability of offending would rise. These theories suggest two ways to use EM to prevent reoffending. First, offenders placed on EM ought to be reasonably rational, not highly subject to impulsive or compulsive behavior, and to highly value even the conditional liberty of EM. Second, offenders on EM should receive intervention to alter their ratings of the attractiveness of offending. For example, for some chemical dependency treatment could make drug use less compelling while others might need vocational training that could lead to earned wages sufficient to tip the balance toward a conventional income with few hazards as opposed to a criminal income with high vulnerability.

While classical and rational choice theory focus on offender decisions, *routine activity theory* considers the offender but adds environmental precipitating factors of “a suitable target, and the absence of a capable guardian against crime” (Felson and Clarke 1998). Among the features of targets that make them “suitable” are “visibility” and

⁹ Or, expanding system capacity by moving “regular” probationers to EM could free space on regular probation for people who would otherwise not receive even the lesser stigmatization of probation.

“access.” If the potential offender is restricted by EM to work and residence, both the ability to view and reach targets is diminished. Although Felson and Clarke list police, security guards, housewives, doormen, neighbors, and co-workers as potential guardians, certainly EM would qualify as well. Routine activity theory seems to suggest a strong potential for crime deterrence while one is on EM but implies no continuing impact after it ends.

There are two major variants of control theory: one focuses on social bonding, the other individual self-control (Ellis and Walsh 2000). There is nothing intrinsic about EM which fosters the crime-inhibiting bond to family, school, church, and other social institutions; however, EM could be used to hold offenders accountable for participation in activities which build (using Hirschi’s terms) *attachment, commitment, belief* or *involvement*. From social bonding theory, one would not expect EM to have an independent effect on reoffending.

Several theories attempt to explain empirical observations of high impulsiveness and poor self-control among delinquents and criminals. Whether one regards these traits as a product of poor socialization (as in the *general theory* type of control theory) or the product of neurological pathology, it is reasonable to view EM as a “self-control assist device” much like the brace one wears on an injured limb. One would not expect any crime control impact of this “self-control assist” to last beyond its application.

The theories discussed above provide reasons to expect positive, zero, or negative effects both during EM and after its termination. Based on theory, the EM would most likely have a measurable impact when applied to appropriate offenders in conjunction with other treatment components. Further, there is some reason to expect a decline in impact after the termination of monitoring. These propositions dictate segregation of reviewed studies into four groups (as shown in Figure 1 below) based on two dichotomous categories: time of measured impact (during EM/after EM) and simultaneous treatments (absent/present).

Figure 1
Proposed categorization of EM evaluations¹

Criterion Period	Program elements in addition to EM	
	<i>Absent</i> ²	<i>Present</i>
<i>During monitoring</i>	Group I	Group II
<i>After monitoring</i>	Group III	Group IV

¹Each evaluation may be included in more than one group.

²Some human supervision is implicit in most forms of EM; if no more than 2 face to face contacts per month are reported and no additional services targeted on offender needs are reported, the evaluation will be placed in the “absent” category.

E. Past reviews

None of the published studies cited in section II-B above have found a significant and consistent impact on recidivism in controlled trials.

This review differs from most of its predecessors in three ways. First, its search strategies extend beyond North America and English language journals. While not necessarily of overall better quality, in recent European research samples are larger and the intensity of treatment efforts accompanying EM seems often to be much higher than in most of the available studies from the United States and Canada. Second, most past studies of EM have focused on post-program reoffending. Many agencies using EM neither build rehabilitation components into their programs nor expect an enduring impact. Examination of whether offending can be suppressed during EM, not just after, is an objective of this review. Third, with little theoretical rationale for an independent crime suppression effect after EM, this review will seek to identify and include composite programs where EM is but one element.

III. Four Objectives of the Review

Claims about EM are conflicting: it saves money, it widens the net so that no money is saved, it is more humane, it is a pointless intrusion, it preserves families versus it contributes to domestic violence, it is the rich man's sanction, and so on. This review will stay with the Campbell mission and focus on reoffending but annotate each study as to the presence/absence of evidence for other claims. The code sheets will be publicly available on the Internet for anyone interested in exploring outcomes other than reoffending. Four primary research questions are proposed:

1. Can EM suppress criminal offenses for the period of its application? Specifically, is there evidence of impact of EM on reoffending during the period of monitoring compared to a similar group of offenders not receiving monitoring?¹⁰
2. Does EM have an independent effect on the continued suppression of criminal behavior? Specifically, is there evidence of impact on reoffending after the end of monitoring in studies where EM is the primary intervention?
3. Does EM facilitate or augment the impact of other interventions so that criminal offenses are suppressed for the period of its application? This differs from the first objective in that it assumes that EM might potentiate the impact of other interventions rather than having an independent impact on reoffending.
4. Does EM facilitate or augment the impact of other interventions so that criminal offenses are suppressed after the end of monitoring? Specifically, do offenders reoffend less after the end of monitoring when EM is combined with other non-trivial interventions?

¹⁰ Suppose two equivalent groups of prisoners are assigned to two conditions. Group A is incarcerated for six months then spends six months on parole without EM. At the end of the period, 10% have committed new offenses. Group B is never incarcerated and spends 12 months on EM and experiences the same 10% new offense rate. Assuming equivalent offense severities, EM might be justified on cost-savings. Several jurisdictions now authorize lifetime probation, parole, or aftercare with some categories of sex offenders. At least theoretically, some offenders could receive EM for life, thus rendering looking for post-EM recidivism impossible.

IV. Methodology

A. Four criteria for study inclusion

1. Each study must include at least some subjects who received EM as it is defined below. Although there are many related technologies, this protocol defines EM as any technology which:

*records the location of an offender within the community at particular places and times without human observation and transmits these data electronically to a central monitoring station, or uses an electronic device to detect the presence of a prohibited substance in the body (or to monitor other physiological functions) of an offender living in the community AND transmit that data to a central location.*¹¹

This definition includes such technologies as automated random telephone calling/voice analysis machines, radio frequency monitoring transmitters linked to receivers attached to hardwired telephones, and Global Positioning System (satellite) tracking systems or wide-area real-time tracking systems based on other technologies. Also included are remote alcohol detection systems. These are included despite human operators currently being needed at remote monitoring centers in some variants of these systems. The definitions are broad enough to include such possible future developments as implantable telemetry for additional chemical and electrical measurements.

2. There must be some group used to compare with the EM group. This proposal would adopt the criteria of Brown, Mrazek, and Hosman and allow studies using:

- a control group
- a historical control group
- an equivalent comparison group
- a randomized controlled trial
- a dosage trial . . . [in EM terms this implies either different forms of EM or durations]
- an alternative intervention group
- a delayed wait control group
- an interrupted time series design (Brown, Mrazek and Hosman, 1999)

At this writing, there appear to have been only two series of randomized trials with EM: to base claims of impact or non-impact solely on the small numbers of offenders at those two sites which had relatively immature programs would be to discard possibly significant information.

¹¹ At the discretion of the protocol review committee, the following phrase could be added here: “or utilizes it to prevent operation of a motor vehicle” thus including ignition interlock studies in this protocol.

3. Each study must include a measure of re-offending or a re-offending-related dependent variable(s).

The preferred criteria are new arrests or new convictions. Relevant but less preferred because of potential interference from policy changes and biased decisions by program staff are such criteria as probation or parole revocations, administrative warnings and sanctions, and positive drug tests. Least preferred are self-reports of crime or substance abuse. In the event of multiple criterion measures, the most direct measure of reoffending for the longest follow-up period up to three years will be used as a criterion for EM effects.¹²

4. Each study must include adequate description of both EM and comparison group(s). Each must describe methods and criteria for subject selection, specifics on methods of assignment into the compared groups, ages, offense histories, legal status (e.g. pretrial, probation, parole), duration of intervention(s), time at risk, description of the EM intervention and any other intervention(s) received by the compared group(s).

If not stated in the study, an attempt will be made to contact the author to obtain information about the following characteristics of the compared groups: ethnicity, immigration status, gender, risk assessment instrument scores, psychiatric classifications, substance abuse or chemical dependency status, employment, income levels, education, and type of area from which subjects were drawn (metropolitan, urban, rural).

B. Exclusion of studies

As long as the conditions of adequate definitions of interventions, samples, relevant criterion measures, and equivalence of groups are met, studies will be included. The lead reviewer and volunteer associates can read English, French, German, and Dutch, the primary languages in which studies have been published to date. A crucial study is currently available only in Swedish and one study may be available only in Hebrew; efforts are being made to find collaborators who can code these studies. The lead reviewer will determine whether studies will be included. No formal provisions have yet been made for assessing the reliability of relevance decisions although the complete database of studies to be considered for review is available at www.renzema.net. As studies are included or excluded, reasons for inclusion/exclusion will be added as

¹² Can a follow-up period be too long? A non-experimental study by Gainey et al. examined the recidivism of 276 offenders at a mean of 7.9 years after EM. These offenders had a mean time on EM of 72.8 days preceded by a mean time in jail of 55.6 days. Gainey, R. R., B. K. Payne, et al. (2000). "The Relationships Between Time In Jail, Time on Electronic Monitoring, and Recidivism: An Event History Analysis of a Jail Based Program." *Criminal Justice Quarterly* 17(4): 733-752. Given the impact of intervening experience and the relatively short duration of EM, this appears to violate the principle that there should be reasonable temporal proximity between independent and dependent variables. Because there still needs to be a significant time at risk, this review will rate higher studies with at risk times of one to three years than studies with longer or shorter times at risk.

annotations to the bibliography with site visitors being invited to comment on inclusion decisions and to notify the lead reviewer of studies.

C. Examples of included and excluded studies

Certainly the randomized trials in Indianapolis by Baumer and Mendelsohn (1990) will be included. Although some of the people on EM had to be excluded from their analysis by virtue of placement by means other than random assignment, the study otherwise meets the criteria. On the other hand the Gainey and Payne (2000) study of recidivism will be excluded both because there is no comparable non-EM group and because the EM “treatment” was too heterogeneous. For example the mean EM days was 72.8 but the standard deviation was 60.6.

D. Search strategies

Electronic database searching is ongoing using the strategies shown in Table 1 on page 13. In addition to the ongoing electronic searching, the following strategies are being or have been used.

1. The lead reviewer’s EM reprint files began in 1987 and produced at least half of the studies to be considered for review.
2. As studies are found, their reference lists are examined for leads to other studies.
3. A DIALOG search of the four social science databases was completed on October 10, 2000; the same databases have since become available with more convenient interfaces through the Kutztown University library, so no additional DIALOG searches will be done.¹³
4. A Copernic 2000 Professional meta-search was done on October 31, 2000 for web sites containing all of the following terms: “electronic monitoring” and “evaluation” and “recidivism.” This search produced 731 items.¹⁴ Item by item examination produced one study not seen elsewhere.

¹³ The databases searched were PsycINFO 1887-2000/Oct, NCJRS 1972-1999/Sep, Sociological Abstracts 1963-2000/Aug, Criminal Justice Periodical Index 1975-1998/Dec. The keywords used were (electronic monitor? OR tether?) AND (probation OR parol? OR pretrial OR intermediate OR offender OR pedophile). This search produced 248 abstracts which were hand-examined for relevance.

¹⁴ The original version of this protocol called for download of the retrieved items into the AskSam database and the use of the indexing features of AskSam to filter the dross. Since then Copernic 2000 has been replaced by Copernic Agent Professional which includes the ability to search within retrieved results; the need for exporting into AskSam has been obviated.

Table 1

ONGOING DATABASE SEARCH STRATEGIES ON
ELECTRONIC MONITORING OF OFFENDERS

DATABASE	LAST SEARCHED	SEARCHED TERMS AND LIMITS	HITS ¹
Academic Search Premier	23 March 2003	("electronic monitoring" OR tethering OR tagging) AND (crime OR criminal OR juvenile OR offender)	68
C2-SPECTR	5 March 2003	All indexed and non-indexed fields searched for "electronic"	55 ²
Copernic Agent Professional (web metasearch & filtering program)	25 February 2003	All words: "electronic monitoring" evaluation recidivism [configured to include 15 major search engines but not Google]	1493 ²
Criminal Justice Abstracts	14 March 2003	"electronic monitoring" in "DE" (descriptors)	106
ERIC	14 March 2003	"electronic monitoring" in full text mode	21
CINCH	March 2002	[needs to be redone]	
Google	24 March 2004	"electronic monitoring" evaluation recidivism "control group"	243
Healthsource Nursing/Academic Edition	23 March 2003	"electronic monitoring" AND (crime OR criminal OR juvenile OR offender or pedophile)	8
Ingenta	23 March 2003	[Dates: 1997-2003] "electronic monitoring"	69
MEDLINE	14 March 2003	monitoring AND electronic AND evaluation NOT cardiac NOT fetal NOT heart NOT diabetes NOT asthma NOT perinatal NOT bladder NOT muscular NOT pH NOT surgical NOT respiratory NOT rat NOT patient	67 ^{3,4}
NCJRS	17 February 2003	Electronic monitoring of offenders OR home detention OR house arrest OR pretrial electronic monitoring	425
ProQuest Digital Dissertations	23 March 2003	Keywords: electronic AND monitoring	18 ³
PsycINFO	23 March 2003	("electronic monitoring" OR tethering OR tagging) AND (crime OR criminal OR juvenile OR offender or pedophile)	23
Social Science Citation Index	Planned: 26 March, 2003	[planned: searching on 8 authors of classic EM evaluation studies]	?
Social Work Abstracts	23 March 2003	"electronic monitoring"	1
Sociological Abstracts	23 March 2003	"electronic monitoring" OR tethering OR tagging	39

¹As of 24 March 2003 all search results have been manually screened and all promising documents obtained or ordered except those from Google; it was belatedly realized that the current version of Copernic does not include Google among the databases searched, although Copernic does include Open Directory which is tapped by Google.

²>95% dross

³100% dross

⁴At least a dozen search strategies were tried with MEDLINE; all produced large amounts of dross and no relevant citations except for a few concerning ignition interlocks.

5. A bibliography on electronic monitoring compiled by the Centre of Criminology at the University of Toronto was printed on February 7, 2001, from http://www.library.utoronto.ca/libraries_crim/elecmon.htm. This bibliography contained 76 items, including a significant number of evaluation reports.¹⁵
6. In April 2001, letters were mailed to the 24 companies believed to still be in the business of manufacturing electronic monitoring equipment. Only one relevant response was received, however that contained leads to five studies previously not known to the lead reviewer. As long as the manufacture of electronic monitoring equipment remains concentrated within a relatively small group of companies, this approach will continue every two years.
7. In March 2001, letters were mailed to the directors of research for the state departments of corrections within the United States. These letters requested copies of evaluation studies of EM and leads to those who had conducted such research. Although many responses were received, this strategy was unproductive and will not be repeated.
8. From 10-12 May 2001, the lead reviewer attended an electronic monitoring workshop sponsored by the Conférence Permanente Européenne de la Probation (CEP) at Egmond aan Zee, Netherlands. Administrators and researchers from several European countries were present and leads were obtained to previously undiscovered research that had not been published in English. The lead reviewer will attend the May 2003 CEP conference.
9. Versions of the February 2003 version of the lead reviewer's bibliography have been sent to three of the most prolific writers/researchers in the EM field with a request that they examine it for omissions in the recent literature. Dick Whitfield and Mike Nellis (both in the U.K.) and J. Robert Lilly (in the U.S.A.) all provided either citations or leads to citations not otherwise obtained. One or more of these three people plus the leader reviewer attend virtually all of the professional meetings which involve EM, and contacts with these three will continue.

E. Methods used in primary research

Most of the 163 sources found (as of March 2003) that purported to include evaluations were actually evaluations of process, not outcomes. The majority reported

¹⁵ A check on March 23, 2003 showed that the URL had changed to <http://www.criminology.utoronto.ca/library/elecmon.htm> and that the bibliography was most recently updated on March 20, 2003. While a number of new EM-related sources are included, no evaluations were found that had not previously been retrieved elsewhere.

outcomes for a group which received EM but did not include useful information about methods of selection, selection ratios, or even historical experience with any similar groups. Most studies are not usable for the purpose of this systematic review. Only a few studies were found using random assignment or any sort of defensible comparison group: these are the studies to be reviewed.

F. Criteria for determination of independent findings

For the most part, reviewed studies have relatively simple outcome criteria. The most relevant finding will be selected for cross-study comparison according to the principles outlined in section IV-A-(3) above.

G. Details of study coding categories

A draft of the code sheet is attached and is also available at www.renzema.net. Categories draw heavily on the work of Lipsey and Chapman (personal communication) and Brown, Mrazek, and Hosman (1999).

H. Statistical procedures and conventions

Coded data will be input into the Filemaker Pro 5 database program. Some analyses will be generated using the calculation features of Filemaker, others will require export to SPSS or Biostat's Comprehensive Meta-Analysis program. It is uncertain at this point whether a formal meta-analysis will be either possible (given the small number of codeable reports, the lack of detail of some of the reports, and issues of program integrity) or worthwhile (possibly no significant effects). If possible, standardized mean difference effect sizes will be computed and reoffense rates will be expressed as odds ratios according to the formulas provided by Lipsey and Wilson (2001).

I. Timeframe

The search for published and unpublished studies for the initial review is complete. Most are in-hand, however a few remain to be secured or translated.

- Pilot testing of inclusion criteria to be completed by 31 March 2003
- Relevance assessments to be completed by 7 April 2003
- Extraction of data from research reports to be completed by 15 July 2003
- Statistical analysis to be completed by 15 August 2003
- Draft review by 15 September

J. Plans for updating the review

All database searches will be re-run in October 2003, March 2004, and October 2004 and vigilance will be maintained for research that surfaces at professional meetings and other non-database sources. Manufacturers will be polled in June 2003 and December 2004. If during any wave of data retrievals information surfaces that would

cast doubt on the conclusions of the 2003 review, an addendum will be prepared. The lead reviewer will not be able to do a major update until a sabbatical that is expected for January through May, 2005. In effect, the first major revision should see publication approximately 18 months after the first review.

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L. Conflict of Interest

Lead reviewer Marc Renzema founded the *Journal of Offender Monitoring* in 1987, sold it in 1989, but returned as executive editor between 1997 and 2002. He is currently on its editorial board but receives no compensation from the *Journal* or any of its advertisers. The *Journal* is supported by both subscriptions and advertisements from the manufacturers of electronic monitoring equipment. Although he occasionally writes for the *Journal* and reviews articles for relevance and/or methodology, he does not decide on *Journal* content nor does he deal with advertisers except to request information about programs and products.

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