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Scottish and International Review of the Uses of Electronic Monitoring

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Acronyms and Abbreviations

AAMR	Alcohol Abstinence Monitoring Requirement
AMS	Alcohol Monitoring Systems
BAC	Blood Alcohol Content
BEM	Bilateral Electronic Monitoring
CEP	Confederation of European Probation
CJSW	Criminal Justice Social Work
CPO	Community Payback Order
DTTO	Drug Treatment and Testing Order
DUI	Driving under the influence
DWI	Driving while intoxicated
EM	Electronic Monitoring *or* Electronically Monitored
GPS	Global Positioning System (satellite tracking)
HDC	Home Detention Curfew
HMU	Home Monitoring Unit (box unit)
IOM	Integrated Offender Management, England and Wales
ISEM	Intensive Supervision with Electronic Monitoring, Sweden
ISMS	Intensive Support and Monitoring Service, Scotland
ISSP	Intensive Supervision and Surveillance Programme, England & Wales
MAPPA	Multi-Agency Public Protection Arrangements
MRC	Movement Restriction Condition
PID	Personal Identification Device (tag)
PPO	Priority and Prolific Offender
RAM	Remote Alcohol Monitoring
RF	Radio Frequency
RFID	Radio Frequency Identification
RLO	Restriction of Liberty Order
SCCJR	Scottish Centre for Crime and Justice Research
SCRAM	Secure Continuous Remote Alcohol Monitoring
SPS	Scottish Prison Service
TAD	Transdermal Alcohol Detection
TAM	Transdermal Alcohol Monitoring
TPIM	Terrorism Prevention and Investigation Measures

Executive Summary

This Review provides a bounded overview of Scottish and international evidence and experience of the uses, purposes and impact of electronic monitoring (EM).

Electronic Monitoring in Scotland: Uses, Costs and Impact

Electronic monitoring, using radio frequency (RF) technology, currently operates at a number of points in the adult criminal justice system in Scotland, which are reviewed in Section 2. EM is most often used with adults as a stand-alone measure without additional criminal justice social work supervision and support from others. Restriction of Liberty Orders (RLOs) and Home Detention Curfews (HDCs) are the two most commonly used electronic monitoring modalities, making up 53% and 45% respectively of all electronically monitored orders in Scotland (G4S, 2015). In terms of children and young people (aged under 16 years), electronically monitored movement restriction conditions are used in a relatively small proportion of cases of those supervised through Intensive Support and Monitoring Service (ISMS) orders in Scotland.

Electronic monitoring is significantly cheaper than the cost of incarceration. The *average unit cost* for electronic monitoring in Scotland in 2013-2014 was £743 (€1,043.73) (a significant reduction from £1,940 (€2,725.21) in 2011-2012) (Scottish Government, 2015; Scottish Government, 2013b). This figure is based on total expenditure across all forms of electronic monitoring, including as part of a Drug Treatment and Testing Order (DTTO) as well as part of Movement Restriction Conditions (MRCs) imposed with children and young people by the Children's Hearings System. In 2013, the *average cost per EM order per day* in Scotland was estimated at £10.17 (€14.29) (Scottish Government, 2013a: 7).

In terms of order completion, approximately 4 out of 5 of those made subject to EM in Scotland complete their period of monitoring (G4S, 2015). There is some evidence that breach rates are higher for those under longer periods of monitoring, among younger people and among those with more extensive criminal histories.

An International Overview of Electronic Monitoring: Uses, Purposes, Impact and Effectiveness

Section 3 of this Review provides a circumscribed overview of a range of purposes and uses of electronic monitoring in different international jurisdictions, including: violent crimes; domestic abuse; sexual crimes; alcohol and drug-related crimes; vehicle theft; with people with prolific offence histories and with people suspected or convicted of terrorism. Two types of offenders are highlighted here, in discussions of the international evidence and experience regarding the uses and impact of global positioning system (GPS) tagging and tracking. In relation to sex offenders, this Review establishes the following:

- Despite some emergent positive research findings of the impact of this technology during the period of monitoring, there remains a significant lack of empirical evidence to support the positive impact of GPS-based monitoring of sex offenders in terms of increasing compliance, reducing re-offending and enabling desistance and reintegration;
- Where research has shown that GPS-based monitoring of sex offenders has been associated with benefits and positive impact, EM is usually integrated with other surveillance, supervision and risk management, and supports;
- Where it is used on a mid- to long-term basis, GPS-based monitoring of sex offenders may be less cost-effective and less easily ethically defensible, in that it can cost more than other electronic monitoring technologies such as RF and 'standard' probation supervision, although it remains cheaper than prison, yet it may not realise significant reductions in re-offending and may have unintended consequences in the lives of monitored people. However, findings on the grounds of fiscal efficiency are mixed; some US studies state that GPS monitoring of sex offenders is cost effective.

Additionally, Sections 3 and 4 of this Review of the uses, effectiveness and impact of GPS tagging and tracking with domestic abuse defendants and offenders show that:

- There has been growth in the use of GPS tagging and tracking in places like the United States, Spain and Portugal, with both criminal justice and civil – in the form of EM restraining orders – pilots and initiatives specifically designed for

perpetrators of domestic abuse. A considerable number of these initiatives use GPS EM at the pre-trial stage, to reduce the use of remand (imprisonment) while ensuring surveillance forms a part of tailored risk management within the granting of bail;

- Limited available research from the US suggests that pre-trial GPS monitoring of domestic abuse defendants is more effective, in comparison to RF EM, in reducing violations and promoting compliance;
- Professional ideology and institutional orientations affect the use and impact of GPS monitoring technology, with motivational and collaborative approaches yielding different results to punitive approaches;
- Bilateral EM is becoming a feature of discussions about victim participation in the EM of domestic abuse offenders, and while victims hold a diversity of positions on this, it seems to attract mostly positive responses. The empirical evidence and criminological literature on GPS-based bilateral EM is limited and relatively new, and it is too early to make strong claims about its impact, and comparisons to RF EM, on compliance, reducing re-offending and enabling desistance after their EM order has concluded.

Section 4 of this Review highlights a number of other significant findings regarding impact and effectiveness based on international evidence and experience:

- Overall, the electronic monitoring programmes and approaches which are shown to reduce reoffending during and/or after the monitored period are mostly those which include other supervision and supportive factors (e.g., employment and education, social capital) associated with desistance. The effective approaches discussed here have developed on the basis of high levels of integration with supervision and support from Probation Officers and other staff and services. In other words, the more effective programmes and approaches, in Europe in particular, are those where EM is not a stand-alone measure.
- The effective approaches discussed here use tailored, and in some cases quite restrictive, eligibility criteria to determine who can participate in EM programmes. This affects how the impact of EM on recidivism, desistance and reintegration should be interpreted.

- A significant number of the major empirical studies conducted – mostly in North America and the United Kingdom – in the last fifteen years conclude that the efficacy of EM in reducing re-offending after it has concluded is modest or minimal. Whereas research from other countries – especially Scandinavian countries and some European countries – indicates more extensive effectiveness and positive impact.
- There is currently only limited empirical literature available which focuses on the perspectives and lived experiences of monitored people regarding issues of compliance (or non-compliance), legitimacy, and desistance from crime. More research is needed.
- Flexibility in the use of EM orders and conditions may foster motivation for monitored people to comply. The capacity to incentivise and reduce curfew hours and days (e.g., curfews from 7 days a week down to 5 days a week) as a form of recognition and reward for a monitored person's formal compliance in the initial stages of an order may positively affect their perceptions of the legitimacy of that order. More research on this is needed.

Findings and Conclusions

Several major findings and conclusions emerge from the Scottish and international literature and experiences incorporated in this Review:

i. **The effectiveness of electronically monitored punishment must be understood as contingent and complex.** Gainey (2014: 345) summarises a fundamentally important made by others in the international literature: 'Electronic monitoring is just a tool and that like any other tool, it can be effectively used for the appropriate purposes and of course ineffectively used where it should never had been applied in the first place.'

ii. **EM is more effective when integrated with the use of other supervision and supports.** There is moderately strong consensus in the international empirical literature that electronic monitoring should be used in tandem with more rehabilitation-focused supervision and reintegrative support options (formal or

informal) in order to effectively maximise opportunities for compliance and desistance from crime. Without complementary supervision and support, the impact of EM as a stand-alone measure may be limited to its duration.

iii. **Current and future uses of EM in Scotland should be guided by the European frameworks and recommendations on electronic monitoring.** A significant number of the issues and concerns raised in the international literature and experience about EM can be addressed or prevented by adhering to the European guidance, which offers a sound foundation upon which to build future developments (see Nellis, 2015).

iv. **There is emerging evidence to support the increased use of 'away from' restrictions and/or bilateral EM as part of a multi-faceted approach to protect victims of violent crime and sexual crime.** Some jurisdictions are making increasing use of bilateral EM in cases of domestic abuse and stalking, although there are variations in how this is done. If EM equipment is working as it should, it can offer advance notice to victims and authorities if a monitored person tries to enter exclusion zones or approach the victim(s).

v. **Victim, public and media attitudes towards EM need to be understood in their cultural context.** Internationally, there remains a paucity of research about these issues. There is some evidence from Sweden that media attitudes towards EM can be improved through effective media strategies, although there is a need for these to be culturally situated and similar media engagement approaches may not work in the same ways in other jurisdictions with a more hostile media and political climate.

vi. **Flexibility and graduated changes to EM orders can be used to motivate compliance:** Flexibility in the use of EM orders and conditions may foster motivation for monitored people to comply. The capacity to incentivise and reduce temporal and spatial restrictions during the initial stages of their order may positively affect their motivation levels, perceptions of the legitimacy of the order and 'may foster reintegration back into society' (Nellis, 2013b: 204).

vii. **One size does not fit all: tailor the use of EM in response to the diversity and vulnerability of monitored people.** The potential positive impact of EM and

generalised claims of effectiveness are significantly diminished in cases where it is used without due regard for diversity and vulnerability.

Further findings and conclusions, particularly regarding the uses of GPS tracking and Remote Alcohol Monitoring, can be found in Section 6, the Conclusion of this Review.

1. Introduction

Electronic monitoring of offenders has existed in Scotland for almost 15 years, yet there is still relatively limited research on its use and impact. Developments in technology present opportunities for the extension of electronic monitoring for new purposes, and with different groups of offenders, but also present new challenges. In the autumn of 2013, the Scottish Government published a consultation on the potential development of electronic monitoring in Scotland to take advantage of advances in technology, in particular the availability of improved GPS technology (see Scottish Government, 2013a). The consultation identified electronic monitoring (EM) as currently being used in Scotland to:

- restrict offenders' movements and monitor their compliance with conditions;
- support prisoners' reintegration into the community;
- provide an element of structure to support the completion of rehabilitative programmes (and possibly disrupt patterns of offending behaviour).

At a general level, the consultation document sought views on how electronic monitoring could be better integrated with other services, how the system of breach and enforcement could be improved, and what the barriers were to increased use being made of electronic monitoring. Part of the consultation focused on how the current electronic monitoring service could be improved, including whether it should be extended to new areas, whether existing systems and processes of information exchange between agencies are effective, which offenders should receive electronic monitoring, whether the current curfew hours are appropriate, how well electronic monitoring operates for children and young people as an alternative to secure care and whether the system could better incentivise compliance with electronically monitored orders. Views were sought on the use and development of new electronic monitoring technologies, including remote alcohol monitoring (RAM) and the potential development of an electronic reminder service. With regards to GPS technology, views were sought in relation to its potential use:

- to monitor sex offenders;
- in voluntary pilots for persistent offenders;

- to protect victims of domestic abuse;
- for all electronically monitored orders.

The consultation closed in December 2013, and analysis of the responses was published in 2014 (Fawcett *et al*., 2014) along with the Scottish Government Response (Scottish Government, 2014b). The principal response by the Scottish Government was the establishment of a working group on electronic monitoring in Scotland – which first met in November 2014 – aimed at increasing awareness of existing provision, enhancing the operation of electronic monitoring where required, and identifying and implementing opportunities for enhanced integration with other services to support desistance processes and enhance public protection.

1.1 Method and Scope

Through the Scottish working group on electronic monitoring, this Review has been commissioned to consider a series of research questions and aims. These centre on two key questions: 'what are the uses, purposes and impact of electronic monitoring in Scotland?' and 'how and why have other jurisdictions used different electronic monitoring technologies and modalities, and how effective have these uses been?' In response to this, this Review discusses: the types of behaviours other jurisdictions have sought to address using electronic monitoring, including assessments of how effective these approaches are; the potential utility of GPS EM, including strengths and limitations, with analysis of its use, cost and effectiveness compared with radio frequency monitoring; and the potential process and challenges of introducing remote alcohol monitoring (RAM) in Scotland.

The aims of this Review are to describe and evaluate:

- The current purposes and uses of electronic monitoring in Scotland, how these work in practice and highlight changes that could improve the current system.
- The behaviours/offences that other countries have used electronic monitoring to address (e.g. certain types of offending, absconding, compliance with community

orders, alcohol/drug abuse, entering prohibited spaces, as an alternative to remand, early release or short-term home leave from prison).

- The extent to which electronic monitoring is used in different jurisdictions to support desistance, to protect the public and/or reduce fear of crime, and/or as a form of punishment and how it operates to try to achieve those ends.

- Impact and efficacy: How effective these uses have been in terms of encouraging or inhibiting desistance, changing other behaviours (such as alcohol abuse), protecting the public, and/or reducing the fear of crime?

This Review draws on international literature (grey and published) and data sources to describe examples of where GPS has been used as a tracking device, and it summarises the published literature on the accuracy and impact of remote alcohol monitoring.

This Review is based on the authors conducting a narrative literature review of both the available Scottish and international literature on electronic monitoring. As such, this Review constitutes a *bounded overview* of the available evidence and international experiences – it is not systematic, nor is it comprehensive. Combinations of the following search terms were used in association with 'electronic monitoring' and 'EM': 'technology', 'tag' and 'tagging', 'GPS', 'radio frequency' and 'RF', 'remote alcohol monitoring', 'bilateral electronic monitoring', 'defendant', 'offender', 'victim', 'effectiveness', 'criminal justice', 'probation' and 'offender supervision', 'prison' and 'post-release', 'crime', 're-offending' and 'recidivism', 'compliance', 'desistance', 'public attitudes' and 'public perceptions'.

In searching and examining the empirical literature, efforts were made to incorporate studies which base their findings on data derived from medium or large sample sizes, as there are limitations in affording extensive credence and inferring generalisability from small qualitative studies of, for example, fifteen or twenty participants. Searches were mostly limited to empirical, policy and practice information sources from the last 15 years, to encompass and reflect recent technological advances in EM and related significant legislative developments in its use and uptake since the 2000s. We readily acknowledge that this Review reflects an orientation towards uses of EM and evidence derived from Anglophone jurisdictions,

as we do not have the capacity to translate and incorporate publications that are not in English or do not have English language versions or summaries (e.g., such as the research cited here from Scandinavian jurisdictions) in this Review.

However, the scope of this Review does not include:

- electronic monitoring technologies which are not attached to or worn by the person, for example, vehicle 'interlock' devices attached to the steering wheel of a car which require drivers to provide a clear breath test through the device before the vehicle will work;
- 'kiosk reporting' where people on probation or other community-based sanctions and measures are required to report to in person, present biometric data to verify their identity and interact with a kiosk machine, usually located within the supervising agency. This is a type of electronic monitoring which has been described as 'ostensibly designed to help probation officers manage large case loads' (Nellis and Lehner, 2012: 5); although private rehabilitation companies in England and Wales, for example, are also making use of them;
- electronic monitoring inside prison facilities, for example, tagging of prisoners and surveillance by prison authorities of perimeters and exclusion zones in a prison facility.

1.2 Language and Terminology

'Electronic monitoring' has become a generic term which encompasses a range of different technologies and modalities, rather than a single type of penal measure (Taylor and Ariel, 2012: 2). Some authors and jurisdictions refer to EM as a sentence, others a condition of a sentence, some as 'electronically monitored punishment', and some instead prefer to refer to it as a tool (Nellis, Beyens and Kaminski, 2013; DeMichele, 2014). In the European context, Nellis and Lehner (2012: 2) define electronic monitoring as 'a general term referring to the forms of surveillance with which to monitor the location, movement and specific behaviour of persons in the framework of the criminal justice process.' Furthermore, electronic monitoring

technologies (e.g., GPS) are differentiated from electronically monitored *modalities* (e.g., EM bail, or a modality of execution of a prison sentence through EM in the community) at different points within and beyond criminal justice processes. A list of abbreviations and acronyms are provided at the outset of this Review, as they are employed frequently in the literature and in practice.

The term 'monitored person' is used frequently throughout this Review as the most accurate and neutral way of speaking about people who are subject to electronic monitoring. In the Scottish context, 'monitored person' is the term used by G4S, who currently hold the contract for EM services in Scotland. In addition to adults monitored through the Scottish criminal justice system, children (under 16 years) are also subject to monitoring through the Children's Hearings System; children are not usually formally spoken of as 'offenders', even if they have histories of criminal and anti-social behaviour. In the international context, the scope of this review means that literature and practices from diverse jurisdictions are incorporated, thus the people subject to EM may be at different points of the criminal justice process (e.g., from pre-trial to post-release from prison). Terms like 'offender' or 'parolee' are used in this Review, but only in reference to specific research studies and practices where the monitored person has been convicted and/or has EM as a condition or component of their order or licence. Furthermore, in England and Wales, there are numerous localised EM initiatives overseen by the Police which monitor people with a history of persistent offending on a voluntary basis, meaning that they are people with convictions, but they are not necessarily the subject of a current penal sanction or offender supervision. Examples of these initiatives are discussed in this Review in the sub-section on people with prolific offence histories.

The term 'stand-alone' electronic monitoring is used in this Review and across the international literature. It encompasses different meanings, depending on the jurisdictional context and the conditions available within the use of a 'stand-alone' electronically monitored order. Stand-alone EM is used here in keeping with Nellis and Lehner's (2012: 2) definition: 'a stand-alone means of execution of a criminal sanction or measure, without being combined with other interventions or treatment measures.' By way of contrast, 'integrated' approaches combine (to differing extents) the use EM with supervision, supports and/or surveillance. For example, the sub-section on 'Violent Crimes' in this Review focuses on a study involving 'EM

supervision' with violent male parolees, and the approaches taken in Norway and Sweden, which are outlined in Section 4, involve close integration of EM with probation and various forms of support. In other words, these approaches are differentiated from stand-alone orders or licences where monitored people are given a tag, a curfew and no supervision or support as such, with contact or intervention limited to monitoring of their formal compliance.

In Section 3, the term 'domestic abuse' is used to encompass similar terms commonly used in other jurisdictions, such as: domestic violence, family violence, intimate partner violence, battery, gender-based violence, and violence against women. Those who experience domestic abuse are described as victims; however, the term 'survivor' is recognised as a useful equivalent. Those who perpetrate domestic abuse are described as perpetrators in some of the literature, as well as the more generic term of 'monitored person.'

In international literature and practice, the term 'bilateral' electronic monitoring is increasingly being used to describe the use of EM with monitored people (from pre-trial onwards) in a way which involves victim participation. In discussions here, victim participation in EM is clearly delineated from that of people accused or convicted of crimes, and there is a dedicated discussion to this in Section 4 under 'Victims' Perspectives and Involvement in Electronic Monitoring', alongside discussions of victims' perspectives who are not bilaterally monitored themselves.

1.3 Introduction to Electronic Monitoring Technologies

Three main types of electronic monitoring technologies are referred to in this Review: (1) radio frequency EM, (2) Global positioning system (GPS) EM, and (3) remote alcohol monitoring. They are briefly and simply described here, to set the scene for the Review. More analytical considerations of their strengths and limitations are featured in Section 5.

Radio Frequency (RF) technology is the form of electronic monitoring currently used in Scotland, and many other jurisdictions around the world. RF EM involves a tag device (called a PID, a personal identification device) being attached to the

monitored person's ankle (or, in some rare cases, their wrist), which transmits a signal to a home monitoring unit (HMU) box installed in their home (in the case of curfews) or other location (in the case of exclusions using 'away from' restrictions). The home monitoring unit is used to monitor their presence at (or absence from) a location during prescribed periods of time.

As its name suggests, Global Positioning System (GPS) technology is a global navigation system that uses satellites to track the location, in real time, of a GPS device, in this case a GPS tag. A GPS tag is only slightly larger than an RF tag. Using GPS tracking, Nellis (2013b: 175) describes non-compliance in the form of absence from a specified location a person has been restricted to at certain times, or presence in an exclusion zone that they have been restricted away from, as 'knowable instantly, and even if it cannot be acted on instantly, there is an electronic record of the moment(s) at which infractions occurred, available for later use in warnings or prosecution.' However, in some active GPS monitoring initiatives based on the restriction of high risk offenders from exclusion zones around victims and their houses and workplaces, an alert of a violation may prompt swift action in alerting authorities such as the police to respond.

The process involved in its potential use in Scotland is described in the following way in the Scottish Government (2013a: 15) consultation:

> The offender wears a tamper-resistant small transmitter around the ankle that receives transmissions from the satellites and triangulates the offender's location based on the relative strengths of the signals. The mobile phone network is then used to communicate that information on the offender's location to a central computer at a monitoring centre in "real time". The central control then uses Google Maps to plot locations, which allows the movements of the tag to be plotted against locations and times (Scottish Government, 2013a: 15).

Depending on the strength of satellite signals, a tag may be able to be accurately located to a range of within 2-10 metres (Scottish Government, 2013a). In the Scottish context, if introduced under the current contract and way of structuring EM, the 'central control' would likely mean the G4S National Electronic Monitoring Centre near Glasgow, or a similar centre if awarded to another EM private services provider. The 'plotting of locations' refers to the establishment of exclusion zones, from which a monitored person is restricted, as well as 'buffer zones' surrounding

exclusion zones, to cater for warnings generated to the EM services provider as well as the monitored person that they are approaching an exclusion zone. However, while mostly beneficial, notification of and communication with a GPS tagged monitored person about approaching a buffer zone or exclusion zone may be complicated in circumstances where this has been established around a victim's temporary residence in a place of refuge such as a women's shelter, raising confidentiality and safety considerations. GPS may be used in tandem with offender supervision and support options.

Finally, Transdermal alcohol monitoring (TAM) involves the person being monitored wearing an anklet – sometimes referred to as a sobriety bracelet – which samples the insensible perspiration on their skin to detect the presence of alcohol. Other forms of remote monitoring include remote breathalysing which also requires a mechanism – such as video or voice recognition – for verifying that the breath sample has been provided by the person being monitored.

2. The Purposes, Uses and Impact of Electronic Monitoring in Scotland

Section 2 provides a circumscribed overview of the forms and functions of electronic monitoring in Scotland, including the different modalities and their relative use, as well as discussion of the available evidence and experience regarding impact and effectiveness.

2.1 The Types of Electronic Monitoring in Operation in Scotland

Electronic monitoring in Scotland is funded by the Scottish Government Justice Department (Community Justice Division). The service is currently being provided by a private contractor – G4S under a five-year contract – and operates at various points in the criminal justice system and in the Children's Hearings System. Both this sub-section and the following sub-section describe the types of EM technologies and modalities available in Scotland, and the extent to which they have been used.

Adults

EM was initially introduced in Scotland on a pilot basis in 1998 as a means of monitoring compliance with Restriction of Liberty Orders (RLOs). Electronically monitored RLOs were regarded as a mechanism for restricting the liberty of the offender in the community, potentially 'in a way which reduces the risk of re-offending, where previous offending has been linked to particular locations or events' (Scottish Office, 1996: para 9.13). RLOs were established through Section 245A of the *Criminal Procedure (Scotland) Act 1995* (as introduced by Section 245A of the *Crime and Punishment (Scotland) Act 1997*) and enabled the courts to require that offenders stay in a specified place for up to 12 hours a day, for a period of up to 12 months, or away from a specified place for up to 24 hours a day for up to 12

months. They could be imposed as a stand-alone option, or in conjunction with a supervisory order. Failures to comply, commonly known as 'violations', included being absent from the address to which the monitored person had been restricted; being present at the address away from which the monitored person had been restricted; withdrawal of consent; and tampering with or damaging the monitoring equipment. In the event of non-compliance, the electronic monitoring provider could initiate proceedings by reporting them back to the court to make a decision. In the case of a proven breach, the court could fine the offender, vary the conditions of the order, or revoke the order and re-sentence the offender for the original offence, taking account of the time during which the order was in operation.

Restriction of Liberty Orders were subsequently rolled out nationally in Scotland in April 2002, following an evaluation of the pilots (Lobley and Smith, 2000) and a consultation by the Scottish Executive on the wider potential of electronic monitoring in the supervision of offenders (Scottish Executive, 2000). The consultation paper suggested that electronic monitoring might contribute to a number of criminal justice objectives: increasing the range of community sentences available to the courts; reducing the use and costs of custody; reducing or preventing offending; protecting victims from specific offenders; and protecting the public from dangerous offenders. Responses to the consultation were broadly supportive of expanding the use of EM on the basis of its cost effectiveness and capacity to enhance public safety, although several responses expressed some doubts about its effectiveness as a stand-alone measure and suggested that it should be firmly embedded in social work interventions (Nellis, 2006a). In announcing the rollout of RLOs, the then Justice Minister made it clear that electronic monitoring was principally concerned with promoting public safety through the imposition of restrictions, while supporting rehabilitation:

> Electronic monitoring has an important part to play in our criminal justice system as part of a package of measures to increase public safety and make our communities safer. The Restriction of Liberty Order complements the range of community disposals already available to the courts. It limits the opportunity for repeat offences, offering stability to those trying to break the lifestyle which may have contributed to the crime in the first place. It can also be used as part of a range of measures for the safe management of high risk offenders in the community (Scottish Executive, 2002).

The use of electronic monitoring was further extended by the *Criminal Justice (Scotland) Act 2003*, which introduced provisions for electronically monitored curfews as a condition of a probation order (S. 46), or drug treatment and testing order (DTTO) (S.47), and as a condition of parole (S.40). The same legislation also specified that the RLO should be deemed an alternative to custody (S. 50 (3)) by stipulating that orders should only be imposed for offences punishable by imprisonment where the alternative would be a period of imprisonment or detention. Electronic monitoring as a condition of bail (or EM bail) was introduced on a pilot basis in three areas in 2005 to seek to improve bail decision-making and encourage compliance with bail. However, a decision was taken not to roll EM bail out nationally following an evaluation of the pilot (Barry, Malloch, Moodie, Nellis, Knapp, Romeo, and Dhanasiri, 2007). The evaluation research found that applications for electronically monitored bail represented a very small proportion (less than five per cent) of potentially eligible cases, with the result that the remand population in the pilot areas was reduced by less than two per cent and there was no evidence of improved confidence in public safety attributable to electronically monitored as opposed to standard bail (Barry *et al.*, 2007).

Home Detention Curfews (HDCs) were introduced in Scotland in 2006 for prisoners serving sentences of less than four years through the *Management of Offenders etc. (Scotland) Act 2005*. Initially, prisoners assessed as suitable could be released up to a maximum period of four and a half months prior to their release date to serve the remaining part of their sentence at home (or another suitable address) subject to an electronically monitored curfew (for between 9 and 12 hours per day). In 2008, the maximum duration of HDC was extended to 6 months and the scheme was extended to long term prisoners (serving sentences of four years or more) who have been recommended for release by the Parole Board at the half-way stage of their sentence.

The decision to release a prisoner to HDC is the responsibility of the Scottish Prison Service (SPS) who assess all potentially eligible prisoners automatically. The SPS risk assessment that is undertaken includes a consideration of the circumstances surrounding the offence and the offender's criminal history along with a report, if requested, from local authority criminal justice social workers to assess the suitability of the home address and community circumstances. The HDC licence

includes standard release conditions, a curfew condition and other conditions considered appropriate by the Scottish Prison Service, who may receive recommendations from an assessment by local authority criminal justice social workers. Certain categories of prisoner, including those serving sentences of less than three months, those convicted of a sexual offence and those who have previously been released from prison on licence on HDC then recalled, are not eligible for HDC.

The decision to breach and recall a prisoner released on HDC is also the responsibility of the Scottish Prison Service (SPS). Breach 'thresholds' of what constitutes non-compliance for all electronically monitored orders are set nationally by the Scottish Government (2013a: 12), and they include: damage to equipment; missing during curfew; attempting to remove the tag; withdrawal of consent; threatening behaviour to electronic monitoring services; time violations; entering an exclusion zone or geographical location. However, compared to a modest capacity for flexibility in the options available to Courts in response to violations and breaches within the parameters of an RLO, breach of HDC or licence conditions 'is likely to result in immediate recall by the prison to custody' (Scottish Government, 2013a: 12).

An evaluation of HDC indicated that most prisoners released on HDC were serving sentences of between six months and two years; their offending profile tended to be less serious than that of the Scottish prison population as a whole and proportionally more use was made of HDC with women than with men (Armstrong, Malloch, Nellis, and Norris, 2011). HDC was perceived by respondents in Armstrong and colleagues' study principally as a mechanism for managing the prison population and the pressures occasioned by overcrowding, although they also believed that it could help ease the prisoner back into society and support the process of reintegration (Armstrong *et al*., 2011).

Provisions within Sections 10 and 11 of the *Management of Offenders etc. (Scotland) Act 2005* establish that electronic monitoring services providers have a 'duty to cooperate' with statutorily 'responsible authorities' (Scottish Prison Service, Police Scotland and local authorities) in the joint assessment and management of sex offenders. This process occurs within the Multi-Agency Public Protection Arrangements (MAPPA). The Parole Board has the responsibility for making the

decision about whether a sex offender is subject to electronic monitoring upon release from custody (Scottish Government, 2013a), and EM is not imposed automatically in all cases of sex offenders managed within MAPPA. The Parole Board's decision is informed by the other stakeholders involved. Where EM is imposed, a sex offender may be restricted to a place and/or restricted away from specific places. The capacity to actively monitor the latter is somewhat limited by the capabilities of RF-based EM technology, which does not 'track' movements, and can only detect the presence or absence of a tagged person within an established zone where there is a HMU (box). Furthermore, for a small proportion of sex offenders managed within MAPPA who are assessed as presenting the highest level of risk, the use of electronic monitoring may be combined with other restrictions and surveillance measures, including 'CCTV in their properties or a supervising officer physically with them 24/7… for these offenders, electronic monitoring will be part of an existing supervisory condition' (Scottish Government, 2013a: 20).

In 2011, following the recommendation of the Scottish Prisons Commission (2008), the Community Payback Order (CPO) was introduced in Scotland through the *Criminal Justice and Licensing (Scotland) Act 2010* to replace existing community sentences (probation, community service and supervised attendance orders). Restriction of Liberty Orders (RLOs) and Drug Treatment and Testing Orders (DTTOs) were not 'rolled up' into the new order. The RLO, specifically, was retained 'for high tariff offenders where the safety of the public in general or of particular individuals (for example, in relation to a conviction related to domestic violence) is at risk' (Scottish Government, 2008: 11). While electronic monitoring cannot be imposed as a condition of a Community Payback Order (CPO), it is possible for an RLO and a CPO to be imposed concurrently, providing offenders with access to supervision and other services as required. Moreover, an additional requirement of electronic monitoring – a restricted movement requirement – was made available to the court (through Section 227ZE of the *Criminal Justice and Licensing (Scotland) Act 2010*) in the event of a CPO being breached. Like an RLO, a restricted movement requirement requires the individual to remain at a specific address for up to 12 hours a day and/or to stay away from a specific address for up to 24 hours a day, with scope for flexibility regarding the monitoring periods imposed. Because the restricted movement requirement can only be imposed following breach of a CPO, failures to

comply are considered serious breaches and must be notified to the court within a maximum period of three days from detection.

Children and Young People

Although the focus of this Review is predominantly on the use of electronic monitoring with adults (defined as those aged 16 years and older in Scotland), it is also important to note its use with children and young people. Proposals to introduce electronic monitoring of under 16 year olds were first contained in a consultation paper *Putting Our Communities First: A Strategy for Tackling Anti-social Behaviour*, published by the Scottish Executive in 2003 in which options included making electronic monitoring available through the Children's Hearings System and extending the availability of RLOs to children and young people aged under 16 years sentenced in the courts. Analysis of consultation responses identified some cautious support for the use of electronic monitoring with children and young people, so long as it was introduced as part of a holistic range of services and supports, was considered a high tariff option that would be suited only to a small number of young people, was subject to regular review and was initially developed on a pilot basis to enable its effectiveness with young people to be assessed. It was also stressed that the impact on families would need to be carefully assessed and appropriate supports provided (Flint *et al*., 2003).

Legislatively enacted in January 2005 through Section 135 of the *Antisocial Behaviour etc. (Scotland) Act 2004* and Section 70 of the *Intensive Support and Monitoring (Scotland) Regulations 2005,* movement restriction conditions (MRCs) were introduced in the context of the Intensive Support and Monitoring Service (ISMS) orders, which was piloted in six sites in 2005. ISMS involve intensive, multi-agency service provision tailored to the individual child or young person's needs and risks, and were subsequently rolled out nationally in 2008.

Relatively limited use has been made of MRCs since their inception, despite some evidence that they are considered by young people and by social workers to be preferable to secure accommodation, and by parents as being helpful in enabling young people to resist peer pressure, reducing conflict regarding when the young

person should be home and keeping the young person safe (Khan and Hill, 2007; MacQueen and Rigby, 2010). A survey of 22 local authorities suggested that the low use could be attributable to a low number of recommendations by professionals, a reduced awareness of the option among professionals, a low number of young people meeting the criteria for secure accommodation, the availability of other resources considered more appropriate for high risk young people and ethical/ideological reservations among practitioners (Orr, 2013). MacQueen and Rigby (2010: 3) similarly describe the electronically monitored MRC component of an ISMS order as 'controversial' among some stakeholders 'that generated ideological concerns.'

2.2 The Uses of Electronic Monitoring in Scotland

The numbers of monitored people in Scotland have varied by year, partly as a result of changes in the availability of electronic monitoring at different points in the criminal justice process. These changes are illustrated in Table 2.1. For example, EM bail ceased to be available as an option in Scotland in 2007, and EM as a condition of probation has not been an option since the introduction of the Community Payback Order in 2011 (although probation orders can still be imposed in the case of convictions for offences that predate the introduction of the CPO, and Restriction of Liberty Orders can be imposed alongside CPOs). Less use has been made in recent years of MRCs through the Children's Hearings System, possibly because this element in no longer a compulsory component of ISMS orders.

Although electronic monitoring is now available at several points in the criminal justice process in Scotland, in practice it is most often used as part of a Home Detention Curfew or in the context of an RLO. By contrast, very limited use has been made of electronic monitoring as a monitoring restriction condition of a DTTO, with only one such condition imposed in the eight years between 2005-2013 (shown in Table 2.1), one imposed in April 2013 – March 2014, and none imposed in the remainder of 2014 (G4S, 2014, 2015).

Table 2.1: *Types of Electronic Monitoring Modalities in Scotland by Year 2005-2013*

Type	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
RLO	965	1016	1054	1184	1069	935	897	1084
Probation	100	120	135	219	294	327	92	4
HDC	0	1312	2156	2121	1908	1836	1965	1915
Licence	5	5	5	18	26	25	20	30
DTTO	0	0	1	0	0	0	0	0
ISMS	0	37	25	28	30	10	18	5
Bail	82	113	40	0	0	0	0	0
CPO	0	0	0	0	0	0	2	11
Total	**1152**	**2603**	**3416**	**3570**	**3327**	**3133**	**2994**	**3049**

Source: Scottish Government.

More detailed data on the use of EM in Scotland in the 12 month period from 1 January – 31 December 2014 indicates that, during that period, a total of 1221 persons had a Restriction of Liberty Order imposed, most commonly for a period of 3 or 4 months (G4S, 2015: 2). RLOs make up around 53% of all electronically monitored orders in Scotland (G4S, 2015: 2). The most common offences for which an RLO was imposed were assault, offences under the *Criminal Justice and Licencing Act*, theft, offences under the *Criminal Procedure (Scotland) Act 1995*, offences under the *Criminal Law (Consolidation) (Scotland) Act 1995*, offences under the *Road Traffic Act 1988*, and offences under the *Misuse of Drugs Act 1971 S4 (Bail Aggravation)* (G4S, 2015). However, other types of offences, including sexual assault and house breaking, also feature in the types of offences for which an RLO is imposed. The majority of RLOs involved restriction to a designated place, with the imposition of only 14 orders involving an 'away from' restriction from a place (G4S, 2015: 2). 'Away from' restrictions can be imposed for up to 24 hours, and they can be imposed concurrently with a curfew with restrictions to a place (which can only be for up to a maximum of 12 hours).

In terms of rates of use of other types of electronic monitoring modalities in Scotland, over the same time period in 2014:

- *Parole:* 16 prisoners were released on parole with a condition of electronic monitoring;
- *Home Detention Curfew (HDC):* The majority of post-release electronic monitoring, however, took the form of Home Detention Curfews, with a total of 1656 HDC licences being made. HDC's currently make up around 45% of all electronically monitored orders across Scotland;
- *Community Payback Order:* Twelve restricted movement requirements were imposed for a breach of a CPO;
- *Probation:* During this period, no new orders were imposed with an electronically monitored curfew imposed as a condition of probation (a type of order that is now infrequently used in Scotland because it can only be imposed in respect of offences committed prior to the introduction of the CPO in February 2011);
- *DTTO:* during this period, no new orders were imposed with remote monitoring as a condition of a DTTO.
- *ISMS:* A total of 31 children and young people under the age of 16 were made subject to an electronically monitored Movement Restriction Condition within an ISMS order.

Source: G4S (2015).

There is currently no published data available on the length of curfew period imposed or the times covered by curfews, though it is likely that most are 'standard' overnight curfews (e.g., 7:00pm to 7:00am). In the evaluation of the RLO pilots, Lobley and Smith (2000) found that the majority of curfews restricted monitored people for seven days per week.

Variations in the use of electronically monitored orders across Scotland were observed in the period from 1 January – 31 December 2014, with different rates of use apparent between geographical locations (with associated population

differences) and between prison facilities (again, with associated differences in prison populations and rates of admissions and liberations). In 2014, some Courts imposed stand-alone Restriction of Liberty Orders extensively (*n* = number of orders): Dunfermline (153), Glasgow (122), Dundee (114), Ayr (114), Livingston (87), Kircaldy (87), Hamilton (79), and Aberdeen (76), Kilmarnock (60), Lanark (44) and Edinburgh (44) (G4S, 2015: 3). In comparison, some Courts barely made use of it in the same 12 month period: Duns (1), Edinburgh High (1), Stranraer (1), Wick (1), Dingwall (2), Falkirk (2), Jedburgh (2), Kirkwall (2), Paisley (2), Greenock (3), and Glasgow JP (4) (G4S, 2015: 3).

In terms of institutional variations between prisons, in the same 12 month period in 2014 (*n* = number of orders received), Home Detention Curfews were most commonly imposed from HMP Barlinnie (291), HMP Addiewell (223), HMP Edinburgh (218), and HMP Low Moss (163) (G4S, 2015: 8). HDCs were least commonly imposed from HMP Dumfries (20), HMP Grampian (45), HMP Inverness (50) and HMP Kilmarnock (68) (G4S, 2015: 8).

2.3 The Impact and Effectiveness of Electronic Monitoring in Scotland

There has been relatively limited empirical research into the operation of electronic monitoring in Scotland, with the main studies having been commissioned by the Scottish Government (previously Executive) to evaluate the piloting of electronic monitoring at different stages of the criminal justice process. In this sub-section, we summarise some of the findings that have emerged from that research regarding the capacity of EM to divert from custody, levels of compliance, reconviction following EM and relative costs. The very limited research that has examined public attitudes to EM in Scotland is also described in the sub-section that follows.

Diversion from Custody

In the evaluation of the RLO pilots, there was an absence of consensus about the type of person for whom EM was most appropriate and what it might be expected to achieve. Factors that were thought might indicate lack of suitability included family tensions, unsettled accommodation, negative attitudes towards electronic monitoring on the part of the monitored person, and chaotic and erratic lifestyles linked to the misuse of drugs (Lobley and Smith, 2000). The evaluation of the pilot suggested that RLOs were generally perceived to be a high tariff sentence that could replace imprisonment. Just under two-thirds of offenders sentenced to an RLO (63%) had previously served a custodial sentence and almost all (94%) had at least one previous conviction, suggesting that RLOs were being used as a relatively high tariff disposal (Lobley and Smith, 2000). However, the number of orders made was much lower than anticipated which, coupled with relatively high revocation rates, limited the ability of EM to reduce the prison population (Lobley and Smith, 2000).

The evaluation of the EM bail pilots indicated that the rate of application for EM bail was very low, especially in Glasgow. Only 306 applications for electronically monitored bail were made out of 6914 potentially eligible cases (4.4%), with 116 (38%) granted bail. This represented a reduction of 1.7% in the use of custodial remands in the pilot areas (Barry *et al*., 2007). Sentencing data was only available for 37 electronically monitored bailees, 14 of whom received a custodial sentence. Electronically monitored bailees were more likely than those in the comparison courts to receive a custodial sentence, and the sentences they received were longer and were not backdated. Barry and colleagues (2007) concluded that, as a consequence of the low number of orders made and the lack of backdating of custodial sentences, electronically monitored bail had had little impact on the custodial remand population.

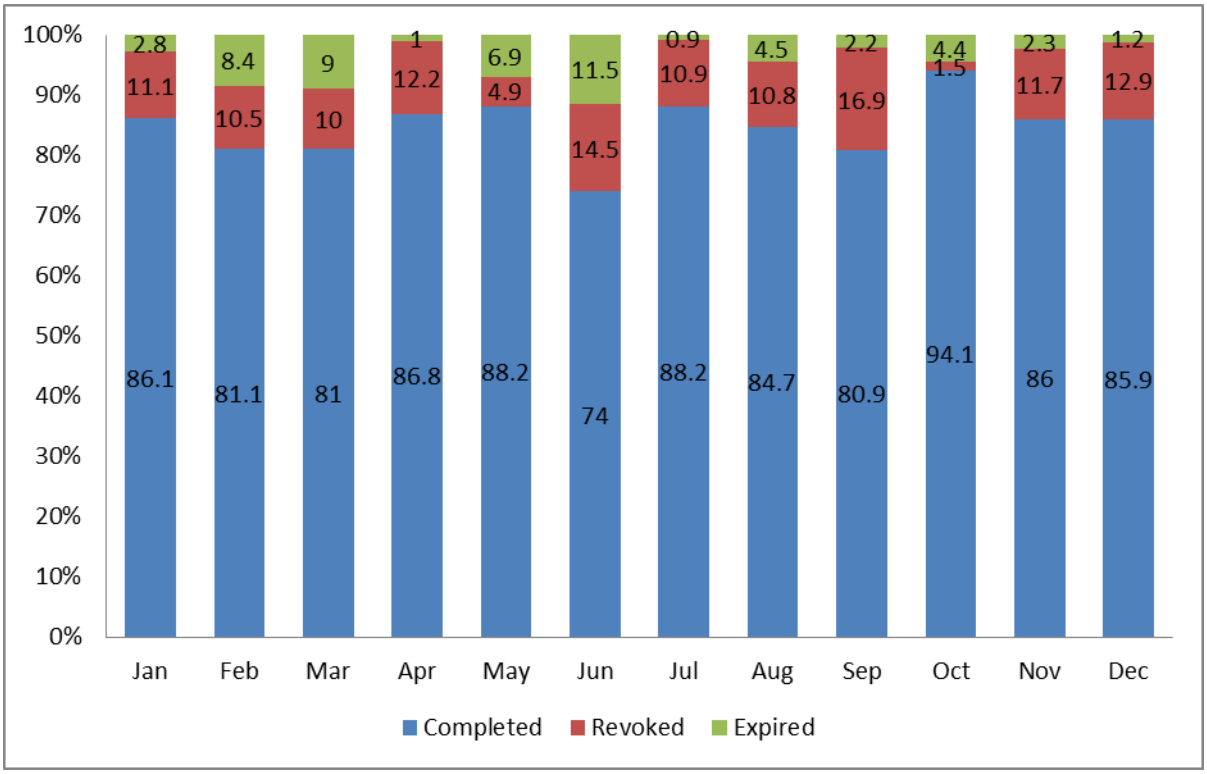
Compliance and Completion of Orders

There are complexities in discussing the influence of electronic monitoring on compliance with orders or licences in Scotland, as the factors contributing to compliance and non-compliance are multi-faceted. In terms of the RLO pilot fifteen

years ago, while the majority of orders (103/153) in the pilot were recorded as having been successfully completed, breach proceedings had been initiated in 46 or these cases, formal warnings for violations had been issued in a further 19 and only 11 monitored people had no unauthorised absences (Lobley and Smith, 2000). Longer orders were less likely to be successfully completed than shorter orders, and failure was more likely among younger offenders and those with a more extensive criminal history. While one third of orders imposed during the RLO pilot were 'stand-alone', most (101) were combined with an existing probation order or one that was imposed to run alongside the RLO (Lobley and Smith, 2000). In the majority of cases, therefore, there was an attempt to ensure that offenders made subject to RLOs also received social work support, although there was no evidence that offenders who were also subject to probation supervision were more likely to complete their orders successfully than those made subject to stand-alone EM orders (Lobley and Smith, 2000).

Fifteen years on, some information is available on electronically monitored order completion rates in Scotland. However, order completion data relate to final outcomes and, as such, do not necessarily give a full indication of actual levels of formal compliance (that is, violations of conditions of the order that do not result in a breach threshold being reached). Figure 2.1 illustrates the rates of (a) persons who have successfully *completed* Restriction of Liberty Orders, (b) who have had their RLO *revoked* by the issuing Court, or (c) their RLO has *expired* whilst the person awaited the outcome of a breach from the issuing court, in Scotland from 1 January – 31 December 2014 (G4S, 2015: 5).

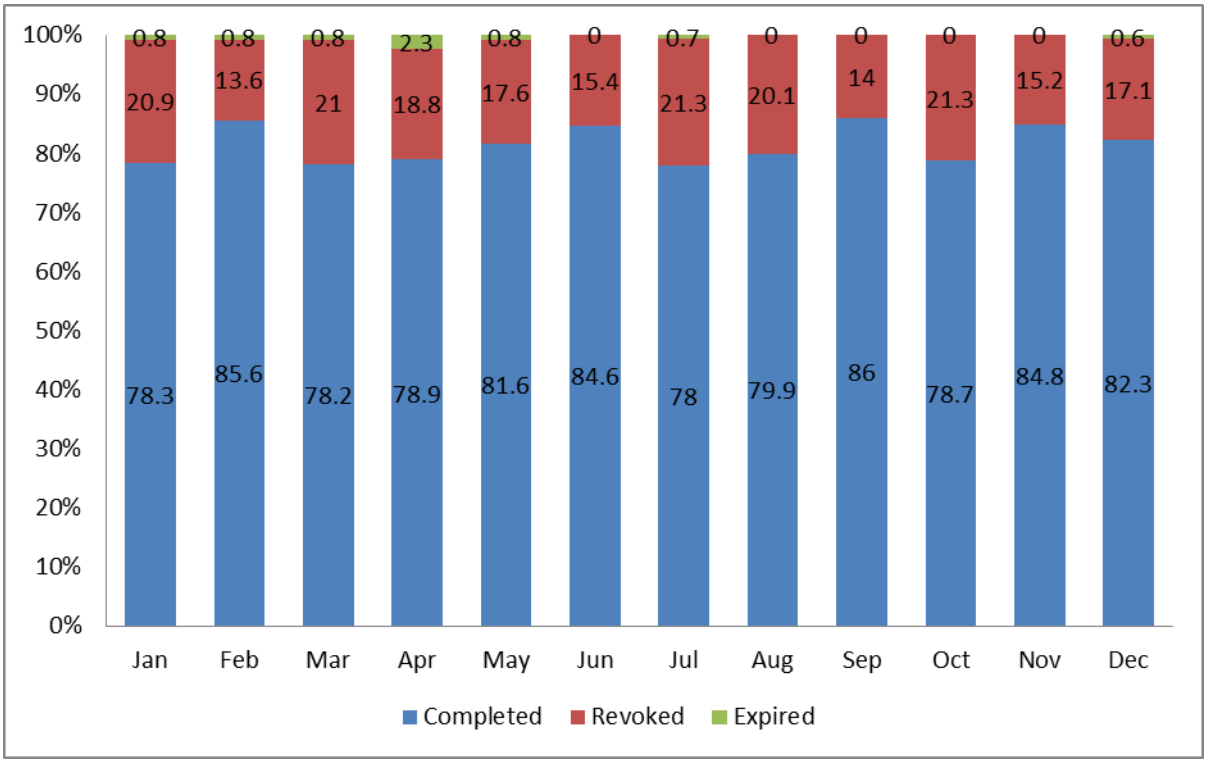
Figure 2.1: *Restriction of Liberty Orders Completions, Revocations and Expiries (%) by Month in 2014*



Source: G4S (2015: 5).

There are moderate similarities in rates of order and licence completion observed for monitored people on Restriction of Liberty Orders, and for those on Home Detention Curfews. Figure 2.2 illustrates the rates of (a) persons who have successfully *completed* their HDC licence period, (b) who have had their HDC *revoked* by the issuing prison, or (c) their HDC has *expired* whilst the person is in custody or hospital, in Scotland from 1 January – 31 December 2014 (G4S, 2015: 9).

Figure 2.2: *Home Detention Curfew Licence Completions, Revocations and Expiries (%) by Month in 2014*



Source: G4S (2015: 9).

These figures illustrate moderately high rates of order completion for the two most commonly used EM modalities in Scotland. Perhaps because HDC is a direct replacement for part of a custodial sentence and the consequences of non-compliance are likely to involve the prisoner being returned to custody, levels of compliance and order completion were also found in the evaluation by Armstrong *et al*. (2011) to be relatively high. In their research, the recall rate for prisoners subject to HDC was 21%, with older prisoners, those serving shorter sentences and those sentenced for violent or drug offences having lower rates of recall. Recalls were found usually to be a result of technical violations of the curfew conditions with only 7% recalled as a result of a new warrant having been served. However, variability in recall rates across establishments was thought to be potentially indicative of

inconsistency of practice (at the assessment or recall stage or both) (Armstrong *et al*., 2011).

By way of contrast to these relatively high rates of compliance and completion, during the EM bail pilot, the impact of electronic monitoring was mixed. During the first 16 months (the period covered by the research), 63 cases of EM bail were completed, although in 44 cases the accused had failed to comply with their electronic monitoring conditions on at least one occasion and 31 had breach proceedings initiated, most of which resulted in electronically monitored bail being continued. Barry *et al*. (2007), like Lobley and Smith (2000), found that although young people under 21 years of age were more likely to be granted EM bail, they were also less likely to comply with it. High levels of non-compliance were found with the use of EM bail in the Hamilton Youth Court pilot, although the number of cases in this study was small (25 young people). Just over half of those given EM bail, 13 people on 18 separate occasions, were deemed to have failed to complete because of a significant breach. In addition, 2 people who completed their period of electronically monitored bail were also recorded as having breached the curfew during it. The most common reason noted for non-completion and breach was the withdrawal of consent for the tagging by the premises holder (9 occasions). Electronic monitoring on bail was considered by social workers not to be appropriate for young people with chaotic living conditions who would have difficulty adhering to the terms of the monitoring arrangements, although it was said to be difficult to predict who would struggle to comply and who would succeed (Popham *et al*., 2005).

Reconviction

The limited time frame covered by the Scottish Government funded evaluations, compounded by difficulties in identifying appropriate comparison cases, has meant that there is limited data available on reconviction following the use of EM in Scotland. Vaswani's (2007, 2009) quantitative analysis of ISMSs in Glasgow provided some evidence of reductions in reoffending for some children and young people, at time when half of all ISMS orders included a Movement Restriction Condition (MRC). Compared with the six month period prior to an ISMS being made, there was a reduction in the average number of offences per month committed by young people

while they were subject to an order, and a 28% overall reduction in monthly offending for those on an ISMS order with an MRC component (Vaswani, 2007). However, it was not possible to identify which elements of the ISMS (as well as any other factors) were responsible for reductions in young people's offending; some questions and critiques have since been raised about the research methods and findings (see MacQueen and Rigby, 2010); and it also appeared that the ISMS order had less of an impact on offending by young women.

One year reconviction rates for RLOs and other sentences are published annually by the Scottish Government. Based on a cohort of offenders sentenced in 2011-12, a recent reconviction analysis indicates a 12 month reconviction rate of 39.2% among offenders given RLOs, with an average of 0.73 convictions per offender (Scottish Government, 2014a). It is also worth noting that the reconviction rate for RLOs has decreased steadily since they were made available nationally in 2002, down from 57.8% in 2003-4. While similar decreases have occurred in reconviction rates following other disposals, they are more pronounced in relation to RLOs. This might suggest improved and more tailored use of EM orders with those who may benefit most from the features of electronically monitored curfews, which may contribute to desistance (Hucklesby, 2008), the increased targeted use of RLOs with lower tariff offenders, or a combination of both.

The reconviction rate for RLOs compared with reconviction rates of 43.8%, 32.5% and 22.9% among, respectively, those given custodial sentences, community payback orders and fines. However, drawing any inferences from these differential reconviction rates is problematic because of differences in the types of offenders who receive different disposals – such as age and previous criminal history – which in themselves would have a bearing on the risk of recidivism. One way to lessen the influence of criminal history on such a comparative exercise is to compare reconviction following different disposals for offenders with similar numbers of previous convictions. The relevant reconviction data are presented in Table 2.2.

Table 2.2: *Percentage Reconvicted within One Year by Disposal and Number of Previous Convictions in Scotland*

Disposal	No previous convictions	1 -2 previous convictions	3-10 previous convictions	More than 10 previous convictions
Custody	10	20	36	61
RLO	29	26	36	61
Community sentence*	19	26	36	53
Monetary	12	19	29	49

* includes community payback orders and 'legacy' sentences imposed for offences committed prior to the introduction of CPOs.

Source: Scottish Government (2014a).

This data appears to indicate that, among those with fewer than three previous convictions, rates of reconviction are lower for those given a prison sentence than for those given an RLO. While this might reflect a deterrent effect of imprisonment on first or 'lightly' convicted offenders (that is, with fewer than three previous convictions), it may also reflect differences in the types of offences with respect to which RLOs and prison sentences are imposed. For those who are more 'heavily' convicted (that is, having three or more previous convictions), reconviction rates are similar for those imprisoned and given RLOs. For these offenders, there appears to be no evidence that RLOs are any more or less effective in terms of subsequent recidivism than imprisonment.

2.4 Costs

There have been attempts to estimate the unit costs of electronically monitored orders and curfews in the evaluations of pilot schemes in Scotland. However, the

resulting estimates of unit costs are likely to have been artificially high as a result of start-up costs and relatively slow take up, and yet they can change significantly over time. For example, fifteen years ago, as a result of the lower than anticipated number of orders made in the pilot RLO scheme (which operated at significant under-capacity) the unit cost of orders was relatively high (Lobley and Smith, 2000). Smith (2001) subsequently suggested that there was little evidence from the evaluation that RLOs could reduce the prison population or the overall costs of the criminal justice system in Scotland.

The costs of electronic monitoring are published annually by the Scottish Government, and currency conversion to the €Euro equivalent are also provided here to enable ease of comparison with the European cost figures provided in Section 5. The *average unit cost* for electronic monitoring in Scotland in 2013-2014 was £743 (€1,043.73) (a significant reduction from £1,940 (€2,725.21) in 2011-2012) (Scottish Government, 2015; Scottish Government, 2013b). This figure is based on total expenditure across all forms of electronic monitoring, including as part of a DTTO as well as part of MRCs imposed with children and young people by the Children's Hearings System. In 2013, the *average cost per EM order per day* in Scotland was estimated at £10.17 (€14.29) (Scottish Government, 2013a: 7). Annual costs of electronic monitoring are problematic to estimate, because most EM orders are not imposed for such a long period of time. Conversely, while *per diem* costs are difficult to calculate for prison sentences, the *average cost per prisoner place* during 2013-2014 was £37,059 (€52,058.56) (Scottish Government, 2015).

In an evaluation conducted a few years ago, two weeks of HDC was estimated to produce a cost saving of £266 and six months a saving of £10,914 (Armstrong *et al.*, 2011). In 2013-2014, the 'average unit cost' of writing a Home Detention Curfew report was estimated at £142, which is different and additional to the average unit cost of the electronic monitoring element of HDCs (Scottish Government, 2015).

2.5 Public Attitudes towards Electronic Monitoring in Scotland

There has been limited research on public attitudes towards electronic monitoring in Scotland. Granville and Bigger (2004) found from street-based interviews and public discussion events, conducted as part of a Scottish Executive justice consultation, that there was wide public support for the use of EM as part of a community sentence or on release from prison, even though most were unaware of how EM operates in practice. Support for the wider use of EM was based upon its perceived ability to restrict offenders' liberty in a way that was tougher than prison because their social life would be severely curtailed. Many also considered electronic monitoring on release from custody to be a necessary measure for more serious offenders (particularly sex offenders) to protect the public upon their release.

Despite the finding that press coverage of the EM bail pilots was mostly sceptical and negative (Nellis, 2007), there is also some evidence that the public have become slightly more supportive of electronic monitoring over time. Based on their analysis of data from the 2009/10 Scottish Crime and Justice Survey, Page *et al*. (2010) found that 49% of respondents considered EM to be a good alternative to prison, compared with 46% of respondents surveyed in 2008/9.

Weighing Up the Evidence: Summary of Key Points

- Electronic monitoring, using RF technology, currently operates at a number of points in the adult criminal justice system in Scotland and is most often used as a stand-alone measure in the context of a Home Detention Curfew or Restriction of Liberty Order without additional social work supervision and support from others.
- Evaluation of pilot RLO and EM bail schemes in Scotland suggested that their impact on the use of custody was limited because of the low numbers of cases involved and relatively high breach rates at the time. 'Back door' measures such as HDC which involve the early release of sentenced prisoners are less susceptible to net widening.
- Around 4 out of 5 of those made subject to EM complete their period of monitoring. There is some evidence that breach rates are higher for those under longer periods of monitoring, among younger people and among those with more extensive criminal histories.
- RLOs appear to be less effective than imprisonment for first time offenders, but one year reconviction rates for RLOs and custody are identical for those with 3 or more previous convictions. Given the significantly lower unit costs for EM than imprisonment in Scotland, the former appears to be a more cost effective measure.
- In terms of children and young people (aged under 16 years), electronically monitored movement restriction conditions are used in a relatively small proportion of cases of those supervised through ISMS orders in Scotland.

3. The Purposes and Uses of Electronic Monitoring: An International Overview

Section 3 provides a circumscribed overview of a range of purposes and uses of electronic monitoring, organised by crime type and type of order or people group, in categories which are not mutually exclusive:

- Violent crimes;
- Domestic abuse;
- Sexual crimes;
- Alcohol and drug-related crimes;
- Vehicle theft;
- People with prolific offence histories;
- People suspected or convicted of terrorism.

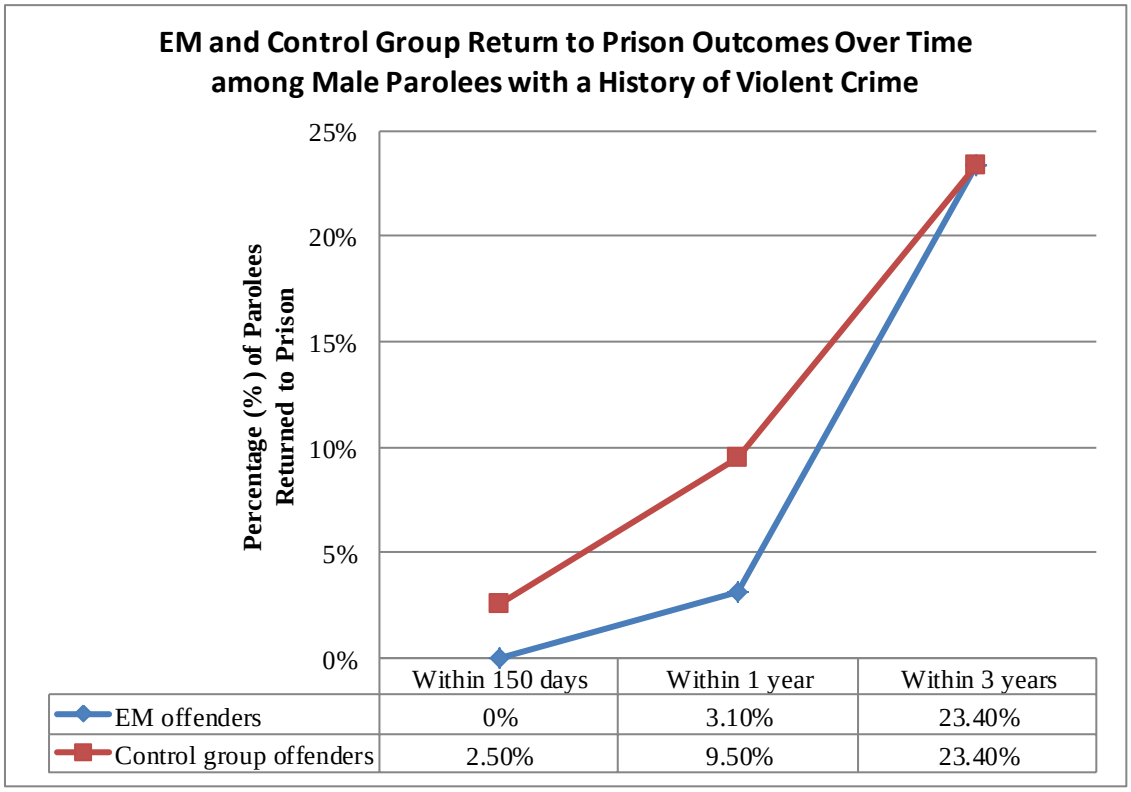
Where relevant, the approaches of specific jurisdictions are summarised as examples throughout the thematically-arranged discussions in Sections 3 and 4. In keeping with the narrative literature review methodology used, jurisdiction-specific examples have been selected and curated to highlight the uses and impacts of EM overseas, with attention drawn to strengths and points of distinction. However, these circumscribed overviews are not comprehensive and, as such, do not account for the use of electronic monitoring in its entirety for a given jurisdiction or approach. We readily acknowledge that the strengths and effectiveness (or, indeed, ineffectiveness or mixed results) of the approaches highlighted here are nested in a constellation of cultural and contextual factors unique to a given jurisdiction, its legislature and implementation of EM. Furthermore, the intended purposes underpinning the use of EM in a given jurisdiction or initiative are diverse, and may range in strength or intensity.

3.1 Violent Crimes

Evidence in support of the uses and implications of electronic monitoring of people convicted of violent crimes is mixed. Key studies from Western jurisdictions are outlined here in this sub-section, and those that follow, to canvass the scope of major empirical findings to date. However, only a small number of empirical studies which use a robust research design are available in relation to this particular topic – most of which were conducted 12-16 years ago, so may be limited in the extent to which they reflect recent literature and developments. While the research reported in this section may include monitored people with convictions for sexual crimes, domestic abuse or terrorism-related violence in their overall sample, discussion of literature on those offences is the specific focus of separate sub-sections in this Review.

Finn and Muirhead-Steves (2002) examined the effectiveness of EM as a supervision tool with male parolees with a history of violence in the US state of Georgia, comparing the outcomes of a group mandated to EM supervision upon release (n = 128) with a randomised control group (n = 158). Their findings indicate that EM had a discrete impact for its duration. Figure 3.1 illustrates their findings comparing the two groups, showing that EM supervision was associated with time delays in return to prison in the short-term, that is, at the time intervals of 'within 150 days' and 'within 1 year' (in Renzema and Mayo-Wilson, 2005: 228*)*. However, the rates of return to prison within 3 years were identical (23.4%) for both groups (Finn and Muirhead-Steves, 2002).

Figure 3.1: *Electronic Monitoring and Control Group Return to Prison Outcomes over Time among Male Parolees with a History of Violent Crime*



Source: data adapted into a figure from results in Finn and Muirhead-Steves (2002: 303) and Renzema and Mayo-Wilson (2005: 228).

Overall, the results of Finn and Muirhead-Steves' (2002: 293) study indicate that, 'after controlling for relevant demographic and criminal history variables, EM had no direct effect on the likelihood of recommitment to prison or time until failure.'

These results from the US state of Georgia sit in contrast with findings from research on EM from the US state of Florida – outlined in Section 4 of this Review – which demonstrate links between the electronic monitoring of violent and other serious offenders and significant reductions in recidivism and non-compliance. In a similar vein but different cultural context, some European jurisdictions employ GPS-based electronic monitoring with small numbers of offenders who have been convicted of

violent crimes or sexual crimes, in the interests of public protection. One of these jurisdictions is France, which has a post-release EM initiative called 'safety surveillance.' It is used with offenders convicted of serious violent crimes (e.g., homicide) or sexual crimes who, 'having initially been sentenced to 15 years' imprisonment or more, and having already served either socio-judicial supervision or judicial surveillance [other types of safety measures, not penalties], are still considered 'particularly dangerous' and presenting 'a very high risk of recidivism'' (Lévy, 2013: 133). These measures can be imposed for a duration of one year (but are renewable). The decision is made by a specialist court, which is informed by medical assessment of dangerousness and psychiatric state, and the presence of the offender's lawyer is mandatory (Lévy, 2013). In 2009, it was estimated that the numbers of violent offenders or sexual offenders eligible in France in any given year for this type of EM safety surveillance was approximately 33 people (Ministère de la Justice, 2009 cited in Lévy, 2013: 133). By contrast, the total numbers and rates of use of EM with these types of offenders in the United States are much higher.

3.2 Domestic Abuse

The use of GPS tagging and tracking of people charged with domestic abuse offences is becoming more common in places such as the United States, Spain and Portugal, particularly at the pre-trial stage with the use of EM bail or electronically monitored domestic violence restraining orders (Ibarra, Gur and Erez, 2014; Ministry of Justice [Portugal], 2013). For example, in the US state of Tennessee, the court can order GPS tracking as a condition of bail for people who are charged with domestic violence offences, or who are the subject of a civil protection order (obtained by victims of domestic abuse against a perpetrator who is not the subject of criminal prosecution) who have previously breached a protection order (Malone, 2013). This approach typically entails a person charged with domestic abuse being tagged and tracked, often with 'away from' restrictions and the imposition of exclusion zones around the victim and their house and workplace. Ibarra (2005) draws attention to the fact that this type of EM and its use with people accused of domestic abuse is typically integrated within a wider range of restrictions on their liberty, including probation-like conditions and bans on communication with and proximity to the victim. In this

approach, surveillance becomes an integral focus of supervision of monitored people (Ibarra *et al.*, 2014).

Ibarra and colleagues (2014) conducted in-depth interviews with 50 criminal justice practitioners whose work involved or related to the use of pre-trial GPS tracking of defendants charged with domestic abuse offences as a surveillance-based compliance initiative in three jurisdictions in the United States. They describe the details of how these approaches work in practice:

> Compliance with curfew and zone restrictions is monitored via transmissions from a tamper-proof one-or-two piece GPS unit in communication with the monitoring system through satellite or cellular technology. "GPS points" that register the defendant's movements are documented and reported in real time by the monitoring system ("active" GPS), enabling the issuing of alerts to supervising staff, or after the fact, via download ("passive" GPS). Officers access the GPS data stream through proprietary mobile and desktop software applications that they request issue alerts based on selections from a drop-down menu (i.e., graphical user interface [GUI]). These settings pertain to such common "codes" … as strap and device tampers, exclusion and inclusion zone violations and low battery or tracker-out-of-range readings, thereby permitting remote surveillance of the offender's temporal and spatial presence for the duration of enrolment in the program (Ibarra *et al.*, 2014: 427).

In these initiatives, EM exists alongside intensive supervision, including face-to-face interaction and sporadic unannounced home visits, as well as intensive 'scheduling' or structuring of the defendant's time and daily routines (Ibarra *et al.*, 2014). In some instances, practitioners also checked GPS alerts against other sources, including victim reported complaints as well as data about the defendant derived from search engines and social media sites (e.g., Facebook) (Ibarra *et al.*, 2014).

In Ibarra and colleagues' (2014) research, differences in ethos and the level of punitiveness were observed between practitioners and institutions across the three jurisdictions in the sample. For example, practitioners from one jurisdiction gave accounts that implied their approach was more punitive, described as a "gotcha" approach, and practitioners deliberately avoided telling defendants about the technological capabilities and level of monitoring they were actually being subject to, whereas practitioners in another jurisdiction emphasised a collaborative approach of

'working together' and using motivational interviewing in communications with defendants to improve their motivation to comply (Ibarra *et al.*, 2014). Another finding related to the use of ambient data from GPS tracking which had the implication of enhancing or undermining both the credibility of the victim, as well as that of the defendant. Some practitioners emphasised 'the exonerating potential of GPS' to defendants to provide 'a source of solace against the threat of false accusation' (Ibarra *et al.*, 2014: 437). Because of the jurisdictional diversity, it could best be said that the results for this approach are mixed, and contingent upon the purposes and ideologies underpinning how and why they are used. However, in this research, some modest promising results are evident.

Evaluation of Pre-Trial Use of GPS Monitoring with Domestic Abuse Defendants in the US

There is only limited in-depth or systematic research available on the effectiveness and impact of using EM with people charged with or convicted of domestic abuse (Erez, Ibarra and Lurie, 2004). A large multi-stage evaluation research project by Erez, Ibarra, Bales and Gur (2012) examined the implementation and use of GPS monitoring technology to enforce court mandated 'no contact' orders in domestic abuse cases, particularly intimate partner violence, in the United States. Their national online survey of agencies providing pre-trial supervision sought information on their patterns of use, costs associated with their use, as well as the perceived advantages and limitations of using GPS technology. Their results showed that, since 1996, agencies have increasingly been making use of this technology 'primarily to enhance victim safety and defendant supervision' (Erez *et al.*, 2012: i).

Secondly, they conducted a study across three jurisdictional sites in the US to examine the impact of GPS monitoring on domestic abuse defendants' program violations and re-arrests during the pre-trial period, which they conceptualised as 'short-term', and on re-arrests during a one year follow-up period after case disposition ('long-term'). In this study, the sample included a total of 1238 GPS monitored defendants, and 2,448 non-GPS monitored defendants (monitored through RF EM, in jail or given a bond without EM). Their results showed that GPS

monitoring had a positive impact on both short-term and long-term behaviour and compliance (Erez *et al.*, 2012: i). They also found differences in compliance between electronic monitoring types: 'defendants enrolled in GPS monitoring have fewer program violations compared to those placed in traditional electronic monitoring (EM) that utilises radio frequency (RF) technology (i.e., remotely monitored and under house arrest, but without tracking)' (Erez *et al.*, 2012: i).

Thirdly, Erez and colleagues (2012) conducted a qualitative study of in-depth interviews with victims, defendants and criminal justice practitioners across six sites in the United States. While victim perspectives were diverse, they predominantly expressed the view that the GPS monitoring of defendants during the pre-trial period provided relief and lessening from abuse that prior to GPS being used (Erez *et al.*, 2012). The challenges and 'burdens' raised in interviews with defendants included: 'living with restrictions and becoming transparent, managing issues of stigma and disclosure… and handling the practical issues that emerge from the technology and equipment' (Erez *et al.*, 2012: iii). Overall, the researchers' warn against taking a 'one-size-fits-all' approach in EM policymaking regarding domestic abuse defendants, warning of the reduced efficacy and unintended consequences of using GPS technology for reasons other than protecting victims or enforcing restraining orders, and the need to balance victim safety with due process for defendants (Erez *et al.*, 2012). Discussions in this section have focused on the electronic monitoring of domestic abuse defendants. Victim's perceptions of and involvement in bilateral EM are discussed further in Section 4 of this Review.

3.3 Sexual Crimes

Internationally, the use of electronic monitoring with people convicted of sexual crimes includes RF monitoring and associated curfews as well as GPS monitoring, depending on the jurisdiction. Notably, however, more emphasis appears to be placed on the use of 'away from' restrictions for the sub-set of perpetrators of sexual crimes against children and young people, restricting and monitoring their proximity to places like schools, playgrounds and parks. Electronic monitoring may be used as a stand-alone sanction, or as a condition of another sanction to check compliance with

their order. Increasingly in the United States, people convicted of sexual crimes against children and young people continue to be monitored well beyond the duration of any other penal sanction imposed, such as a probation or parole order. Payne, DeMichele and Button (2008) cite some of the benefits of using GPS monitoring as:

- *Flexibility* – EM can be applied in different ways and using different conditions in response to different offence types;
- *Reintegration* – EM allows offenders to live at home, maintain employment and avoid criminogenic conditions and harms related to incarceration;
- *Control* – Integration of EM with Probation and Parole supervision ensures extensive oversight;
- *Retribution* – The punitive and intensive nature of EM satisfies public desires for EM to be experienced as punishment.

These 'benefits' are contestable, not least because of their impact on one another: the extent to which one is realised (e.g., retribution or control) will paradoxically affect the extent to which others are attained (e.g., flexibility and reintegration). Electronically monitored home confinement is different from incarceration, in that it is based in the community; however, it should not be confused with the attainment of community reintegration. Despite some emergent research, there is still a significant lack of empirical evidence to support the benefits and efficacy of the proliferation of electronic monitoring, especially through the use of GPS, of sex offenders (Bishop, 2010; Cohen and Jeglic, 2007; Renzema and Mayo-Wilson, 2005).

In the absence of convincing evidence, the popularity of policies mandating the electronic monitoring of sex offenders in the United States has arisen, in part, for political reasons in response to influential negative media coverage and public opinion (and fear of crime) following high profile cases involving child victims (Bishop, 2010). Only limited empirical information is available regarding public perceptions on the impact and use of electronic monitoring. Levenson, Brannon, Fortney and Baker (2007) conducted a study of community members' perceptions of sex offenders and public protection policies and punishments in a county in Florida.

The public perceptions regarding different policies and penalty types – including electronic monitoring – are summarised in Table 3.1. Approximately 62% of research participants indicated they would support electronic monitoring as effective in reducing sexual crime. As will be discussed further in Section 4 regarding the extensive use of EM in Florida, this result should be understood as being derived from a jurisdiction where EM is already common.

Table 3.1: Public Perceptions of Public Protection Policies and Punishment of Sex Offenders in Florida

Do you think the following strategies are effective in reducing sexual offences?	
Strategy	*Percentage (%) answering "Yes"*
Community notification	83%
Restricting where sex offenders can live	58%
Treatment in prison	71%
Treatment in the community	65%
Community education	55%
Chemical castration	51%
Restitution	38%
Prison	67%
Electronic monitoring	62%
I would support these policies even if there is no scientific evidence showing that they reduce sexual abuse	
Partially true	24%
Completely true	49%

Source: Levenson *et al.* (2007: 15).

Overall, as Table 3.1 illustrates, Levenson and colleagues (2007) found strong support for public protection policies, community notification and intensive

penalties. They also found inaccurate community perceptions of sexual offending, with participants over-estimating the recidivism rates of sex offenders, viewing them as a homogenous group with regard to risk, and holding sceptical views of the effectiveness of sex offender treatment (Levenson *et al*., 2007). Media and public perceptions of electronic monitoring in other jurisdictions are discussed more generally in Section 4 of this Review; however, the moderate public support for EM of sex offenders found in this study should be noted as occurring against a backdrop of public support for nearly all forms of containment and intensive intervention, of which electronic monitoring only forms one component.

Challenges, Critiques and Unintended Consequences of GPS Monitoring of Sex Offenders

A range of questions and concerns have been raised about the challenges and unintended consequences of GPS monitoring of sex offenders, particularly arising from its extensive uptake and popularity with policymakers in the United States (Armstrong and Freeman, 2011; Bishop, 2010; Button, DeMichele and Payne, 2009; DeMichele, Payne and Button, 2008; Payne, DeMichele and Button, 2008; Payne and DeMichele, 2010, 2011). The ethical concern of net-widening is a major challenge to the widespread use of GPS monitoring, particularly where monitored people would have otherwise completed their order and involvement in the criminal justice system if it were not for the EM condition. Where EM is used and integrated with other forms of offender supervision, the operational (and, indirectly, fiscal) question of workload arises. Several commentators have challenged the notion that EM makes it easier to monitor sex offenders, instead arguing that the use of EM has a negative impact on workload for probation and parole staff (DeMichele and Payne, 2007; Payne and DeMichele, 2010).

Osmori and Turner (2012) used a quasi-experimental design to conduct a small study of the costs of supervision for high-risk sex offenders on parole with and without GPS monitoring in California. Similar to legislative developments in other US states in the mid-2000s, California passed *Jessica's Law (Proposition 83)* in 2006 to mandate that registered sex offenders on parole had to be electronically monitored for life using

GPS technology, as well as restriction requirements of where they could live in proximity to schools and parks. At that point in time, there were approximately 9,000 registered sex offenders on parole in the state, and these developments reflected a shift from intensive supervision to a focus on containment and control (Janetta, 2006 in Osmori and Turner, 2012). The research found that GPS monitoring of high-risk sex offenders was not cost effective: within the 1 year study period, 'the GPS group cost over an average of US$4,600 more per parolee than the comparison group' (Osmori and Turner, 2012: 12). Furthermore, parolees in the GPS group had equivalent rates of technical violations of parole as those in the comparison group; however, they had fewer arrests for new crimes (Osmori and Turner, 2012). Others have warned of the staggering costs of monitoring sex offenders in the long-term or for their lifetimes, with costs arising from the equipment roll-out and maintenance, as well as the labour intensive costs of monitoring and responding to alerts and breaches (Payne, DeMichele and Button, 2008).

In addition to the issue of cost, other challenges and unintended consequences are presented by increasing the use of EM in community based sanctions and measures. Button, DeMichele and Payne (2009: 17) analysed the legislative patterns in the extensive use of GPS electronic monitoring of sex offenders in numerous US states. Their summary of the implications for Probation and Parole officers and institutions is presented in Table 3.2.

Table 3.2: *Analysis of US Legislative Patterns and the Implications for Probation and Parole Officers in the Extensive Use of GPS Electronic Monitoring of Sex Offenders*

Pattern from the Legislation	***Implications for Probation and Parole Officers***
General versus specific policy	Probation/parole officers working in states that have specific policies may have their workloads increase dramatically.
Sentence integration	Probation/parole officers will need to expand their abilities to ensure that various types of sentences are administered simultaneously or consecutively.
Risk assessment	Probation/parole officers will need to be effectively trained how to determine risk.
Punitive nature of the policies	Historically, probation has been seen as rehabilitative and treatment oriented. Although probation can be regarded as punitive, GPS may be the most punitive form of probation. Probation/parole officers must be able to reconcile and integrate divergent punishment goals.
Evaluation of policies	Several states require that the policies will be evaluated. Probation/parole officers must be trained how to gather appropriate data that will effectively assess the utility policies. Thought should be given to using an empowerment approach to evaluate the policies.
Reliance on offender fees	Probation/parole officers will need to make sure that offenders are paying for the monitoring. In doing so, probation/parole officers will need to work with offenders to make sure they are able to pay their other bills. Also, probation/parole officials must recognize that the fees alone will not be nearly enough to pay for GPS.
Breadth of offenders	Probation/parole officers will need to be able to deal with a variety of kinds of sex offenders, including young offenders and repeat sex offenders.
Implied causality	The laws suggest that sex offending is caused by opportunity and availability. Most research suggests that histories of violence and other factors contribute to sex offenders' motivations. Narrowly defining the cause of sexual abuse may place individuals at risk and be an ineffective use of resources.

Source: Button, DeMichele and Payne (2009: 17).

There are distinct cultural and institutional differences between how probation and parole operate in jurisdictions in the United States, and the extent of generalisability or import to the Scottish context. However, some of the implications, such as conflict between welfarist and rehabilitative penal values and more punitive and retributive penal values, bear relevance for consideration if GPS monitoring of sex offenders is to be used extensively in Scotland in the future.

3.4 Alcohol and Drug-related Crimes

The uses, impact and costs of using Remote Alcohol Monitoring (RAM) are discussed in Section 5 of this Review. Furthermore, the use of EM in Scandinavian countries – as reflected in the approaches taken by Sweden, Denmark and Norway – discussed in Section 4 of this Review involve significant numbers of monitored people convicted of drink driving offences. However, the impact of EM in terms of re-offending and compliance are not delineated based on offence type, so the effectiveness of using EM with people who have committed alcohol and drug-related crimes is not specifically known.

Lapham and colleagues (2007) conducted a study about the impact of multiple types of interventions (polygraph tests, mandatory vehicle sales) and intensive supervision on 472 people convicted of repeat driving while under the influence (DUI) offences in the US state of Oregon. All participants were a part of a DUI Intensive Supervision Program (DISP) involving collaboration between a County Court, probation practitioners and staff from a private EM services provider. Study participants were assigned to 'four sanction groups: (i) standard DISP conditions with EM and vehicle sales requirement; (ii) standard DISP conditions with vehicle sales requirement but no EM requirement; (iii) standard DISP conditions with EM requirement but no vehicle sales requirement; and (iv) standard DISP conditions with no EM or vehicle sales requirement' (Lapham *et al.*, 1621). In this study, electronic monitoring involved being tagged with a PID on their ankle and monitoring of their presence (or absence) in the home in accordance with an agreed schedule, as well as a telephone-

based remote alcohol testing device using voice verification and fuel cell alcohol testing technologies (Lapham *et al.,* 2007). Electronically monitored participants were required to stay home, except for authorised absences for scheduled appointments and agreed reasons. The alcohol testing occurred several times daily at unannounced times. The research findings showed that sanction groups 2, 3 and 4 had significantly higher arrest risks than group 1 (standard DIPS conditions with EM and vehicle sales requirement) in the first 90 days of probation (Lapham *et al.,* 2007). In the short-term (at the three month mark), electronic monitoring was associated with reductions in post-sentence traffic violations for this group; however, this effect quickly disappeared over time (Lapham *et al.,* 2007). The extent to which electronic monitoring alone can be associated with improvements in compliance or reductions in re-offending is difficult to discern because of the multi-faceted and intensive nature of this program. However, Renzema (2013: 261) draws attention to the fact that, at the three month point, EM was the most influential difference to the standard intensive supervision protocol, providing some of the clearest evidence of 'a surveillance effect depressing both technical violations (rule breaking and absconding) and new offences for the duration of monitoring.'

3.5 Vehicle Theft

The use of electronic monitoring has been piloted on a small scale with high risk young offenders as a component of a more comprehensive strategy in response to high rates of vehicle theft in Winnipeg, Manitoba. From 2003 to 2008, Winnipeg had the highest rates of vehicle theft in North America (Linden, 2010). Their EM pilot utilises GPS tagging and tracking, as well as curfew conditions and a mobile phone, to form an intensive surveillance and supervision regime. Its operation relies on inter-agency collaboration between a private provider and interdisciplinary correctional staff working with young offenders, including 'Auto Theft Probation Officers'. Pearson's (2012) master's research evaluation of the EM pilot conducted 50 interviews with youth and staff, and used quantitative data to compare a group of 45 high-risk auto theft young offenders who were electronically monitored with a control group who were not. Pearson's (2012) evaluation found small reductions in re-offending and non-compliance for high risk young offenders who were subject to

electronic monitoring. However, their participation in the EM pilot involved extensive surveillance and supervision, and these results cannot entirely be attributed to electronic monitoring. Approximately 60% of the youth interviewed said that EM helped them comply with their order (Pearson, 2012). One of the interesting recurrent themes in the young people's perspectives was that the tag and curfew enabled them to 'save face' with friends, with participants citing EM as 'an excuse' to their friends in order to avoid negative behaviour and co-offending (Pearson, 2012: 71).

3.6 People with Prolific Offence Histories

In England and Wales, electronic monitoring has been used moderately extensively in recent years with people with prolific offence histories. The reason they are not referred to as 'prolific offenders' here is due to the fact that the genesis of many of these initiatives has arisen are distinct from those that occur within mainstream criminal justice and offender management in England and Wales. These initiatives are operated by regional Police forces, participation in EM is based on 'voluntary' consent, and, while they have prior convictions, the monitored people are not necessarily the subject of any other criminal justice supervision or sanction at the time of monitoring.

In 2010, Hertfordshire Police added the use of GPS tracking technology and continuous real-time location monitoring, in conjunction with private EM services provider Buddi, to their Integrated Offender Management (IOM) programme – a multi-agency initiative co-managed with probation services to monitor 'priority and prolific offenders' (PPO's) (Nellis, 2014b). In the absence of a legislative basis for the introduction of EM in this pilot, participants were asked to 'volunteer' to be monitored. Nellis (2014b: 172) describes how participants 'were given the incentive of being spared the intrusive, street-level attention that they would otherwise have received from the police; by using their resources more discriminatingly (not randomly rounding up 'the usual suspects') the police made significant cost-savings.' In this initiative, which is based on voluntary consent, there was an observable

attrition rate with participants removing the GPS tag and withdrawing their consent to be monitored (Nellis, 2014b).

Geoghegan (2012: 66) makes stronger claims about the positive impact of Police-led electronic monitoring, based on data from the EM initiative run by Hertfordshire Police for prolific offenders, the C2 Programme: 'the programme has managed 80 of Hertfordshire's most prolific offenders, solved 8,500 crimes, increased the detection rate for burglary by 80%, reduced its incidence by 15%, and reduced recidivism among offenders by 20%.'

Despite the fact that the EM IOM initiative yielded mixed results, in that EM was not necessarily associated with significant improvements in compliance and reduced re-offending, various other Police services in England and Wales have since taken up the use of electronic monitoring in tandem with private providers a similar fashion, parallel to or outside of the operation of EM in mainstream offender management, which has a legislative basis. The limited available evidence regarding the use of GPS technology in particular, and electronic monitoring in general, with people with prolific offence histories means that it is difficult to draw conclusions about its effectiveness. As will be discussed in Section 4 of this Review, studies of reductions in re-offending and improvements in compliance do not necessarily base their results and findings specifically along the lines of offence type or offender type, so it is difficult to know where research participants in the international literature have prolific offence histories. Furthermore, any conclusions that are drawn with regard to developments in England and Wales need to take into consideration the social, political and legal context in which EM is used there, especially where it involves uses that are outside of traditional criminal justice surveillance and supervision processes.

3.7 People Suspected or Convicted of Terrorism

In some jurisdictions, people who are suspected of terrorism or deemed to pose a potential threat of terrorism may be subject to control orders and/or pre-emptive measures which typically include EM and curfews, without having been charged or prosecuted. In England and Wales, for example, the Terrorism Prevention and

Investigation Measures (TPIMs) initiative has a legislative foundation, but its operation exists outside of the criminal justice system and is justified on the basis of public protection and crime prevention. In addition to this, some jurisdictions use EM post-sentence with people who have been convicted of terrorism-related crimes and have completed their criminal justice sanction. Some EM and curfew conditions may be time-limited and subject to review, renewal or completion after a legally specified period (e.g., two years), whereas in other jurisdictions, they can be imposed as a long-term or a lifetime measure. Across the spectrum of terrorism-related cases, and regardless of whether RF or GPS technology is used, EM usually features as only one condition or component of a wider and more intensive surveillance and control regime. For example, in Canada, conditional release orders for terror suspects are described as 'extensive and invasive', affecting an individual's associations, movement and communication, including: curfews, a GPS tag and electronic monitoring, telephone monitoring, mail interception, and government officials have the power to enter and search the person's property at any time (Coady, 2010: 262-263).

Very little information about its use with people suspected or convicted of terrorism is publicly available in the jurisdictions where this occurs, making it difficult to empirically reflect on effectiveness and impact. Its use as a component of control orders has been questioned and criticised by Western scholars in criminology and law (Jaggers, 2008; Smith and Gibbs, 2013). In Australia, Smith and Gibbs (2013: 90-91) highlight human rights concerns and questions about 'the legal protections that govern the making of orders, their constitutionality, their compliance or otherwise with international human rights protections and their likely effectiveness.'

The fourth section of this Review builds on the above summaries of the offence types and groups of people that EM is used with, to consider its impact and effectiveness in light of available international evidence and experiences.

4. The Impact of Electronic Monitoring: An International Overview

While compliance with the conditions of EM orders, reducing re-offending and promoting desistance from crime are inter-related concerns, subtle but significant differences exist between them. Compliance with the conditions of an EM order does not necessarily produce, nor signify desistance from crime. Compliance with penal sanctions and conditions 'is not the same as (re)integration – that is, becoming a fully functioning and participating citizen' (Halsey and Deegan, 2015: 3). The supports and interventions which target criminogenic risks in order to reduce the risk of re-offending (e.g., EM evening curfews which aim to reduce association with pro-criminal peers and illegal activities previously habitually undertaken at night) are different to the factors and supports which might be catalysts for reintegration, desistance and pro-social change (e.g., opportunities for meaningful pro-social pursuits, like work and recreational hobbies, and supportive social networks). In light of this, compliance, recidivism and desistance as they relate to monitored people are discussed separately here. Yet there is a certain level of overlap between these discussions, reflected in the jurisdictional approaches discussed throughout Section 4. First, consideration is given to the overarching imperative of decarceration and diversion from prison, and the integration of EM within offender supervision and personal supports and opportunities in the community.

4.1 Decarceration and Diversion from Prison

The genesis and rationale of electronic monitoring has largely been defined by its potential as a noncustodial alternative to incarceration. While its diversified uses have expanded beyond this, decarceration, in the form of early release from prison or as a prison sentence executed in the community, and diversion from prison continue to be central to its impact and aims in many jurisdictions. While Scottish prison numbers have slowly declined since a peak in 2011-2012 (Scottish Government Justice Analytical Services, 2015), Scotland continues to face one of the highest prison population rates in Western Europe and, as such, decarceration and

diversion from prison remain relevant concerns. In this sub-section, Scandinavian approaches are highlighted for the ways in which they integrate electronic monitoring with other community-based surveillance, supervision and supports.

Electronic Monitoring in Denmark – Understanding the Impact of EM in Criminal Justice and Social Welfare Terms

In recent years, the use of EM has accounted for a growing number of new entries to the Probation Service in Denmark (from 1,694 in 2009 to 2,512 in 2013), and in Norway (from 784 in 2009 to 1,889 in 2013) (Kristoffersen, 2014). The population of monitored people in Denmark is diverse, including a range of offence types, from road traffic offences to theft and violent crime (Esdorf and Sandlie, 2014). In Nordic countries, EM is predominantly used to execute prison sentences in the community, incorporating supervision with specific conditions:

> Supervision with electronic monitoring – this order implies serving a prison sentence outside the prison establishment. Having a residence, a daytime occupation (e.g., a job or attending school) and consent from any cohabitants are minimum requirements for all participants serving electronic monitoring in the Nordic countries. The order includes a prohibition to leave one's residence except at specified times and for specified reasons, for example to go to work or to buy necessities. Use of alcohol or drugs is also prohibited while serving the order (Kristoffersen, 2014: 12).

Ostensibly, electronic monitoring serves the purpose of *decarceration* in Nordic countries such as Denmark and Norway; yet, because of how it is used, there are complexities in discerning the extent to which it actually lessens the use of *confinement*, given the extensive use of restriction to the home, outside of the hours of authorised and mandated activities elsewhere. In both Denmark and Norway, the position is put forward that the advantage of EM being executed as a prison service in the community is that there is no risk of net-widening because these people are already the subjects of punishment, and the decision to use EM is made by correctional authorities. EM is not available to the judiciary to prevent people being sentenced to EM who would otherwise not receive such a punitive or intensive sentence (Esdorf and Sandlie, 2014).

Since 2006, one of the priority target groups for EM in Denmark has been people under the age of 25; however, a specified age limit was more recently removed as an eligibility criterion. Esdorf and Sandlie (2014) summarise the positive impact of EM in Denmark:

- 60% of all prison sentences of less than 6 months are executed at home with EM;
- EM has replaced 400 prison places since its inception;
- There is a high degree of compliance with EM (less than 10% are revoked);
- EM has a much lower recidivism rate (17%) compared to prison (38%);
- EM is much cheaper than prison;
- EM is considered a punishment (strict control, quick reaction to breaches);
- EM has broad acceptance by public opinion, media, justice system and politicians.

The impact of EM, like other penal sanctions, is not limited to the realms of criminal justice. Andersen and Andersen (2014) investigated the impact of electronic monitoring on subsequent unemployment and social welfare dependency in Denmark. Age differences within their sample of electronically monitored people were observed. For those under 25 years of age, serving a sentence as EM instead of imprisonment was directly linked with reduced social welfare dependency (Andersen and Andersen, 2014). This research finding reflects personal benefits, in terms of employment for people with convictions, and social benefits in terms of reduced public expenditure on welfare. However, for older monitored people, dependency on social welfare remained unaffected by how they served their sentence, and EM did not leave them better or worse off than imprisonment (Andersen and Andersen, 2014). Overall, they argue that the impact of EM in Denmark is clear: electronic monitoring is 'less expensive' and it is 'less harmful than imprisonment to the life-course outcomes of offenders' (Andersen and Andersen, 2014: 349).

In response to the Danish research results, DeMichele (2014) highlights that social welfare dependency is a proxy measure for unemployment, and underscores the links between unemployment and crime, suggesting that EM might reduce re-offending and promote desistance from crime indirectly. Payne (2014) applauds the Danish research as unique and illustrative of the types of knowledge that is missing from the expansive use of EM in the US and the UK, however, he raises the legitimate question of whether other aspects of the implementation of EM and associated treatment and community-based support might have also contributed to reductions in social welfare dependency for young offenders in Denmark?

Electronic Monitoring in Norway – Using EM for Diversion and 'Normal' Life in the Community

Since its advent in 2008, electronic monitoring in Norway has been overseen within regional Probation Service areas to focus on community-based supervision of 'priority' target groups, predominantly juvenile offenders and first time offenders, as well as those convicted of road traffic offences, driving while intoxicated and economic crimes, fraud, bribery and corruption (Kylstad Øster and Rokkan, 2012; Esdorf and Sandlie, 2014). To be eligible for EM, offenders need to be sentenced to less than four months in prison or they must have less than four months left to serve on a longer sentence of imprisonment for a non-violent crime, and those who have committed serious violent crimes tend to be excluded. Courts are not involved in deciding who participates in EM in Norway, as it is up to the offender to apply and an administrative decision is made by correctional services staff in response to their application.

The purposes of using EM in Norway are stated as: 'positive [personal] development, preventing reoffending and… EM should be implemented in cases where it is presumed to actually enhance the possibilities of rehabilitation' (Rokkan, 2012b: 7). In order to balance restrictions of liberty with rehabilitative goals, similar to the other Nordic countries discussed in this Review, the Norwegian approach is to integrate EM within a suite of interventions and surveillance:

> The offender is obliged to be outside their home and active during the daytime – in school, at work or otherwise – and may be subjected to alcohol and drug controls at any time… Special units for electronic monitoring have been established within the existing local probations offices. These units have a well-qualified multidisciplinary staff of both prison officers and social workers. There is great emphasis on dynamic security and close follow-up from the staff. The offender must accept a very tight supervision and control-scheme and has to participate in motivational and crime prevention programs or other activities matching the individual offender's need for rehabilitation (Ploeg and Sandlie, 2011: 387).

Guided by the principle of 'normality', Norwegian sanctions are managed in ways that limit freedom, in that EM and other community penalties are just that – punishment – and yet time served is arranged constructively as it 'must resemble 'normal life' to the greatest possible degree' (Ploeg and Sandlie, 2011: 390). Monitored people have access to a range of health and welfare services, which are made available to all people serving prison and community-based sentences in Norway. The supervision of monitored people is structured around ensuring that they participate in a pro-social and productive routine, including a minimum of two meetings at the Probation office and two supervision sessions at work or home each week (Esdorf and Sandlie, 2014).

While the use of EM is still relatively new in Norway compared to other jurisdictions, evaluation research results show very low rates of revocation (4.5%), which can partially be interpreted as an indicator of non-compliance and breach (Esdorf and Sandlie, 2014). Research has been conducted to analyse the recidivism rates of a sample of 900 offenders who served their sentences with EM in 2008 and 2009 (the first two years of EM in Norway), with recidivism rates for this cohort measured as approximately 10% (Rokkan, 2012b), with the same re-offending rate again estimated in 2012 (Kylstad Øster and Rokkan, 2012). However, some differences in re-offending are observed within the 2008-2009 cohort when it is broken down based on offence type. People convicted of violent crimes (average age: 30 years) have a recidivism rate of approximately 13%, and people convicted of drug-related crimes (average age: 32 years) have a recidivism rate of approximately 19% (Rokkan, 2012b: 17).

Review of the effectiveness of EM in Nordic countries should be qualified by consideration of the purposes and target groups with which EM is used, and the ways in which its use and impact is influenced by cultural and contextual factors. Firstly, the in-depth and high calibre training and resourcing of correctional service staff in Norway, for example, inclusive of special units and multi-disciplinary teams, is exemplary, relative to what is available in other jurisdictions (see Ploeg, 2012; Kylstad Øster and Rokkan, 2012; Rokkan, 2012a, 2012b, Rokkan and Johnsen, 2012). Secondly, in contrast to Scotland, England and Wales and other Western jurisdictions, the involvement of private corporations in electronic monitoring in Denmark and Norway is intentionally minimal; instead, EM is governed and implemented by the state through Probation Services (Ploeg and Sandlie, 2011; Nellis, 2015). Thirdly, despite being known for their low prison population rates and low recidivism rates, the judiciary in Norway and Denmark routinely sentence specific groups, for example drink drivers, to short terms of imprisonment (e.g., under four months), part of which correctional services may choose to let them execute in the community under EM. In Denmark, for instance, almost two thirds of prison sentences are shorter than three months (Danish Prison and Probation Service, 2013). While other Western jurisdictions have high prison population rates and high recidivism rates, they may be less likely to send people convicted of drink driving to prison and, where sentences of incarceration are given to offenders of any type, other Western nations may be more likely to give prison sentences of longer duration than those typically given in Scandinavian jurisdictions. The appeal of policy transfer of EM to aid diversion of particular groups or execution of short prison sentences is likely to be mediated by these factors.

4.2 Compliance

Internationally, there remains a lack of empirical knowledge about questions of 'how' people experience electronically monitored conditions and orders, and 'why' they do or do not comply with them. Nellis (2009) rightly criticises the majority of official evaluations from the 1990s and early 2000s for lacking the perspectives and experiences of monitored people, and therefore making them limited in their capacity to understand and draw inferences about monitored people's compliance.

Hucklesby's research (2009, 2013a, 2013b) is among the first to do so. She investigated the experiences and attitudes of offenders subject to EM curfew orders (stand-alone orders) in two cities in the north of England. The case files of 217 male and female offenders subject to EM curfew orders were examined – 118 of whom had completed their order without formal breach, and 99 who had been breached (Hucklesby, 2009). Interviews were also conducted with 78 offenders at the end of their curfew orders. The average age of research participants was 27 years old, however 43 per cent were aged between 17 – 22 years (Hucklesby, 2009).

Participants in this research cited the following reasons as having an influence on their compliance with EM curfew orders:

- *Instrumental compliance and criminal justice influences as deterrent* – participants spoke of instrumental reasons for complying, based on a fear of potential breach and punishment (in particular, the risk of being sent to prison) for non-compliance. Instrumental compliance was the most highly cited reason by participants;

- *Surveillance-based compliance* – participants spoke of knowing they were being watched, the surveillance and precision of the EM equipment increasing their chances of being caught for non-compliant behaviour, and being aware of the alerts and follow-up that would occur if they did not comply. Participants also described the regular phone calls and visits as reminders to comply;

- *Motivation and choice to comply* – participants were generally pragmatic in their views that they had a choice to comply, as EM could not stop them leaving or breaching the curfew, and that was what they needed to do to complete the sentence. Participants' motivation to comply was negatively affected by substance use and impulsivity;

- *Community ties and social capital* – interestingly, the influence of relationships with family and significant others, conceptualised in terms of social capital, and short-term compliance was mixed. The absence of community ties was associated moreso with an increased likelihood of non-compliance, whereas non-compliance also occurred in cases where offenders were curfewed to their usual address, with some participants citing that being easily locatable resulted in

harassment from others and their decision to leave the property for personal safety reasons. A number of participants stated that their children were central to their decision to comply; however, the compliance of parents in the study was mixed.

Source: Hucklesby (2009: 260-265).

Hucklesby (2009) describes the reasons and motivations for compliance with EM curfews as complex, and suggests that probation services and others involved in the supervision of EM may balance the threat of sanction for non-compliance with the possibility of incentives for compliance (e.g., time reductions on the EM curfew order, or flexible adjustment of curfew hours and conditions after sustained periods of compliance).

4.3 Reducing Re-Offending

Most of the preceding sections contain some discussion of the impact of EM in reducing re-offending for particular crime types and people groups, which is further consolidated and complemented here. Empirical support for directly linking the use of electronic monitoring with reductions in re-offending is mixed (see Renzema, 2013). Recent evidence is emerging to demonstrate that EM can be effectively used to this end – with a distinction being made as to *when* it is more likely to promote or produce reductions in re-offending, i.e. during the monitored period or after it has concluded. A significant number of the major empirical studies conducted in the last fifteen years – mostly derived from North America and the United Kingdom – have found that the efficacy of EM in reducing re-offending after monitoring has concluded is modest or minimal, or, in some cases, non-existent or negative (Bonta *et al.*, 2000a, 2000b; Burrell and Gable, 2008; Finn and Muirhead-Steves, 2002; Renzema, 2013; Sugg *et al,* 2001; Whitfield, 2002).

Some studies, especially those from Europe, indicate a modest positive impact on re-offending in comparison to other types of penal sanctions. Again, these results need

to be interpreted in light of the fact that recidivism and desistance are contingent on a wide range of factors – in these cases which may be inclusive of but extensive beyond EM. For example, Killias and colleagues (2010) conducted a randomised control trial in Switzerland, randomly assigning 240 people to either electronic monitoring (RF and curfew) or community service. Reconviction data, self-reported delinquency and demographic data showed marginal differences in results between the two groups: those assigned to EM re-offended at lower rates than those assigned to community service; however, monitored people were also 'more often married and lived under more favourable financial circumstances' – factors which may have had a bearing on their propensity to re-offend or desist (Killias *et al.*, 2010: 1155).

In contrast to the studies claiming EM has little or no impact in reducing re-offending, others have produced more positive and more recent research findings which contrast with such claims. For example, in a study of criminal recidivism after prison and electronic monitoring in Buenos Aires in Argentina, Di Tella and Schargrodsky (2013: 28) found that electronic monitoring had a 'large negative causal effect on criminal recidivism', compared to prison. A substantial proportion of cases in their sample for both EM and prison were pre-trial. However, there are peculiarities about judicial process and ideology, as well as serious issues regarding prison conditions, in Argentina that make the extent of the generalisability of these findings of large reductions in recidivism difficult to discern (see Di Tella and Schargrodsky, 2013; Renzema, 2013). Following the next sub-section on Florida, the use of EM in two countries in particular – Sweden and Israel – is highlighted for how their integrated and multi-faceted approaches, which are similar to one another, have a demonstrable impact on reducing re-offending.

Electronic Monitoring in Florida – EM Home Confinement of Serious Offenders

Researchers from the US state of Florida have been somewhat emphatic in linking the use of EM with reductions in re-offending and in non-compliance, and their use of large sample sizes in their research adds credence to such claims. Radio frequency monitoring was introduced in Florida in 1987, and GPS monitoring was introduced in

1998. Following a high profile case involving the rape and murder of a child in 2005, EM is being used even more extensively and punitively in Florida. Since then, sex offenders convicted of molesting a child under 12 years old receive a life sentence with a minimum mandatory sentence of under 25 years and, where they are released from prison, they are subject to electronic monitoring for life. It should be acknowledged that this development occurred after the data collection in the following research was collected.

Padgett, Bales and Blomberg (2006) reviewed data from a sample of 75,661 serious offenders (including those convicted of violent, property and drug-related crimes) placed on home confinement in Florida across a five year time period from 1998 to 2002. The sample was split into those with and without electronically monitored home confinement. It spanned a range of sentence types: original sentences to home confinement, split sentences (prison followed by supervision) to home confinement, post-prison sentences (Home Confinement – Parole), and sentences to home confinement for a violation of probation (Padgett *et al.*, 2006). However, it did not include people sentenced to a standard probation order. Furthermore, in Florida, the conditions of home confinement are set by the sentencing judge and, apart from conditions relating to restriction to the home and whether or not a person is electronically monitored, other conditions may include: 'participation in a treatment program (domestic violence, psychological, drug, and/or sex offender treatment), participation in an educational program, regular drug testing, and/or the completion of public service hours' (Padgett *et al.*, 2006: 74).

Overall, Padgett and colleagues (2006: 61) found that both radio frequency and GPS monitoring 'significantly reduce the likelihood of technical violations, re-offending, and absconding for this population of offenders.' Their research findings about the impact of EM home confinement in Florida are extraordinary, especially given the large sample of serious offenders. In terms of the impact on compliance, 'offenders on RF 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 a technical violation' (Padgett *et al.*, 2006: 79). Furthermore, for new offences, they found a 94.7% reduction for both RF and GPS monitoring (Padgett *et al,* 2006).

Further empirical analysis of the uses and impact of EM in Florida has been documented in a subsequent qualitative and quantitative research report released in 2010 (Bales *et al*, 2010). The research sample it is based on includes administrative data from 5,034 medium- and high-risk offenders on EM (experimental group) and 266,991 offenders not placed on EM (control group), as well as face-to-face interviews with 105 offenders, 36 supervising officers, and 20 administrators (Bales *et al.*, 2010). Similar to positive earlier findings of Padgett *et al.* (2006) regarding re-offending and compliance, Bales and colleagues (2010: 58) found a 31% reduction in the likelihood of a revocation (for a technical violation or for a misdemeanour or felony arrest) or absconding from supervision for those placed under electronic monitoring, compared to the control group placed on other forms of community supervision. They also found that GPS had a more positive impact (6% more effective) than RF monitoring on reducing failure (due to non-compliance, re-offending or absconding) in supervision.

The qualitative research findings from the same study canvassed the perspectives and experiences of offenders, officers and administrators in Florida (Bales *et al.*, 2010). Their interview data highlights the mixed experiences, especially the negative impact and complexities, of electronically monitored punishment, with common themes centring on the following:

- Offenders and officers believe EM has negative consequences for the offenders in terms of their relationships with their spouses, significant others, and their children;
- A large proportion of offenders expressed a sense of shame about being on EM and felt they were stigmatised by others. Additionally, the majority of offenders believed that media accounts of EM exacerbate the levels of stigma they receive;
- Offenders and officers were almost unanimous in their assessment that being tagged and monitored is a serious detriment to offenders' ability to obtain employment and remain employed;
- A significant portion of offenders on EM who are required by the courts to reimburse the state for the cost of this technology are limited by their ability to abide by this requirement because of the infrequency with which jobs are available among this relatively unskilled and under-educated population, other

costs offenders must pay for supervision and treatment and other personal financial obligations relating to housing, food, and transportation, child care, etc.;

- A critical issue raised by respondents involved the frequent problem of the EM GPS equipment regularly lost signal with a satellite, which would register as a notification or violation. Having to move and leave to be monitorable (within signal range) again impacted on some offenders' work.

Source: Bales *et al*. (2010: xi).

Lilly and Nellis (2013) acknowledge the large cohorts involved in the evaluative studies in Florida as providing some of the most large-scale and extensive data currently available on the use of GPS-based monitoring with sex offenders. However, they critique this research on two fronts. Firstly, Lilly and Nellis (2013: 33) point out that the Padget *et al.* (2006) study 'blurred differences between EM house arrest and tracking, and ignored the possible influence of probation on the offenders being studied.' Secondly, 'they then inappropriately extrapolated this [crime suppression effect] to support the idea of lifetime GPS tracking for released sex offenders' for life, questioning them on the grounds of ethical defensibility and supporting a universal (i.e. not flexible) approach (Lilly and Nellis, 2013: 33).

In summary, while the research emerging from Florida highlights significant cost savings in using electronically monitored punishment as an alternative to custody, as well as impressive results in the interests of reducing re-offending and public protection, the individual lived experiences of EM temper the otherwise glowing aggregate results. Their accounts suggest that EM impacts negatively on factors known to influence reintegration and desistance (e.g., relationships, belonging, employment), which highlights the differences between the realisation of positive results during EM supervision and the challenge of sustaining positive results, especially reduced re-offending, after its completion. On the issue of social stigma, Renzema (2013) draws attention to the changing meaning of EM in the United States where, for years, it signified a penal sanction. In the last fifteen years, particularly following high profile cases attracting considerable negative publicity and new laws named after victims (e.g., the *Jessica Lunsford Act* in Florida), numerous US states

have mandated the long-term or lifetime electronic monitoring of sex offenders, meaning that being tagged and/or tracked increasingly is associated with this specific type crime, even though it is employed with a wide spectrum of offence types and people groups (Renzema, 2013).

Overall, the factors and reasons which might explain the mostly positive results in the use of EM with medium- and high-risk offenders in Florida are multi-faceted. There is no one policy lever or jurisdictional factor which can account for the extent of the impact of EM there. In the qualitative findings, administrators and senior practitioners in Florida emphasise that EM is 'just a tool' to be used alongside others, and it does not substitute for personal communication and other important features of effective offender supervision (Bales *et al.*, 2010: xi).

Electronic Monitoring in Sweden – Integrating Probation Supervision with Electronic Monitoring

The Swedish approach to electronic monitoring is intentionally characterised by a high level of support and a high level of control, where EM is used in combination with other forms of supervision, support and surveillance (Wennerberg, 2013). As such, Sweden has been critiqued and acclaimed at an international level as a premier example of the constructive use of electronically monitored punishment (Nellis, Beyens and Kaminski, 2013).

The use of EM as a stand-alone measure is avoided in Sweden. Notably, since the 1990s, EM has been developed and overseen by Kriminalvården**,** the Swedish Prison and Probation Service, with the involvement of private companies limited to the provision of EM equipment (Nellis and Bungerfeldt, 2013). Intensive supervision with electronic monitoring (ISEM) is used as an alternative to incarceration. A more recent EM post-release programme enables prisoners to be released up to six months earlier than the date on which they would normally be eligible for parole. The EM release programme is targeted at those serving a prison sentence of 18 months or longer, which is a moderately long sentence in Sweden (Wennerberg, 2013). However, reforms in 2007 meant that EM release can be used as a part of 'extended parole' for any prisoner serving over six months eligible, including those released to

halfway houses, for a period of up to 12 months (Nellis and Bungerfeldt, 2013). Additionally, EM is used within some low security and open prisons in Sweden in the form of RF equipment and tagging of prisoners and the establishment of inclusion and exclusion zones in the prison (Carlsson, 2009).

The approach used in ISEM means that monitored people are confined to the home and 'only allowed to leave when he or she is taking part in the obligatory occupation, which normally means studies or work, or in other scheduled activities required by the sentence, such as taking part in a treatment programme' (Wennerberg, 2013: 116). If the monitored person leaves or comes home at times that are not scheduled in their personal regime, the Swedish Prison and Probation Service is alerted to follow them up (Wennerberg and Holmberg, 2007). Like other Nordic countries using EM, daily employment is a central feature of both ISEM and EM release. Where a person is otherwise eligible for ISEM or EM release but does not have a job, the Swedish Prison and Probation Service 'will arrange employment' doing tasks that are similar to community service (Wennerberg and Holmberg, 2007: 13). A designated 'contact person' in a monitored person's workplace reports to their Probation Officer in the event of non-attendance or other forms of non-compliance (Wennerberg and Holmberg, 2007). Probation Officers visit the person a few times a week, without giving prior notification, to supervise compliance and, where necessary, conduct alcohol breath tests or drug tests to check mandatory abstinence from substance use (Wennerberg and Holmberg, 2007). A further component of the intensive supervision with electronic monitoring (ISEM) is a small monetary penalty where monitored people who have a 'viable' income pay a small daily fee into a victim support fund (Wennerberg, 2013). While victims' views on this vary, the monetary penalty has received moderate positive support (Bungerfeldt, 2014).

The Swedish EM early release programme is quite similar, and also requires monitored people to work and participate in activities relevant to their rehabilitation and reintegration. Any use of alcohol or drugs while under EM is considered a serious breach, and the detection of substance use through a breath test or urinalysis results in the monitored person being recalled to serve the remainder of their sentence in prison (Wennerberg, 2013). The target group and sample of participants taking part in EM release has changed over time as policies and eligibility criteria have developed. For example, numbers of applicants serving a sentence of

two years or more of imprisonment increased when the rules guiding the use of EM release were altered to include temporary absence in the form of granting 'leave' one day per month (Wennerberg and Holmberg, 2007: 10). Wennerberg (2013) draws attention to criticisms of the level of control used in EM release, explaining that monitored people in this scheme are granted less free time than in any other alternative release programme or prison leave offered by minimum security prisons.

The average duration of an ISEM or an EM release order is 2-4 months (Nellis, 2013). Overall, a 'large proportion' of people monitored through ISEM or EM release have been convicted of violent crimes (e.g., assault), drink driving and sexual crimes (Wennerberg and Holmberg, 2007: 16; Nellis, 2013). However, eligibility and acceptance into EM is largely limited to those who are assessed as low risk (Wennerberg, 2013).

Breach and revocation rates are low: 10% for ISEM, and 6% for EM release – and a significant number of these are for use of alcohol (Nellis, 2013; Wennerberg, 2013). Various evaluations have found that monitored people consistently express mostly positive perspectives about their experiences of EM (Brottsförebyggande rådet [Brå] 2003, 2004, 2005; Wennerberg and Holmberg, 2007). The overall positive impact of both ISEM and EM release in Sweden needs to be interpreted in light of the moderate level of selectivity governing who takes part. A significant number (in 2007, estimated at 40%) of offenders sentenced to a maximum of six months in prison are 'not invited to apply' for ISEM, and the proportion granted EM release from prison is even lower (Wennerberg and Holmberg, 2007: 10). Evaluations have found that offenders selected to participate in EM release are better educated and come from more favourable socio-economic backgrounds (Brottsförebyggande rådet [Brå] 2003, 2004, 2005; Wennerberg, 2013).

In an influential study, Marklund and Holmberg (2009) conducted research examining the effects of early release from prison for the initial cohort of the first 260 people to participate in an early release initiative in Sweden, comparing them with a control group. This initiative included other requirements alongside EM, such as those listed above (e.g., employment). Marklund and Holmberg found that the early release group had significantly lower rates of re-offending compared to the control group in a three year period after release. Furthermore, the most significant

differences between the two groups were observed among those assessed as presenting a low level of risk: 'where the proportion who reoffended within 3 years was more than twice as large in the control group as in the electronically monitored [EMB] group' (Marklund and Holmberg, 2009: 56). Yet the authors urge caution in attributing these results to EM alone as it forms one component of several others involved in the early release initiative.

Renzema (2013: 259) describes the Swedish results presented by Marklund and Holmberg (2009) as 'impressive'; however, he is quick to draw attention to the context in which they occur. He argues that the generalisability and import of such successful implementation and outcomes of EM to other non-Scandinavian jurisdictions may be 'somewhat limited given the umbrella of Sweden's employment, housing, social and medical services available to both the EM and control groups' (Renzema, 2013: 259).

In addition to its use with adults, EM has been used since 2011 with juvenile offenders (aged 15 – 17 years old) charged with serious offences and detained in secure residential care in Sweden. The use of GPS enables them to be monitored while on leave to attend school, training courses, and job centres (Nellis and Bungerfeldt, 2013). While criticised by some as a punitive departure from traditional Scandinavian exceptionalist values, especially as they apply to juveniles, this initiative has enabled young detainees to access more leave in the community (Nellis and Bungerfeldt, 2013).

Electronic Monitoring in Israel – Integrating Therapeutic Treatment Interventions with EM

Similar to and following on from the 2009 Swedish study of EM release, Israeli researchers examined re-arrest and re-incarceration rates among 155 prisoner participants in an EM programme enabling their early release on licence, analysing both their recidivism during the programme (Shosham, Yehosha-Stern and Efodi, 2013) and in a period of four years after its completion (Shosham, Yehosha-Stern and Efodi, 2014a). The Israeli EM programme includes community-based therapeutic treatment and social work support, as well as other forms of monitoring (e.g., drug

testing). Radio frequency (RF) tagging equipment and curfews are used. It is a multi-faceted EM programme overseen by the Prisoner Rehabilitation Authority, which is a government service. According to the Ministry of Public Security (2015) in Israel, the aims and purposes of the EM programme are:

- To bring partial relief to the problem of overcrowding in prisons and police detention cells;
- To reduce the damage done by imprisonment;
- To allow the detainee to remain in touch with his community;
- To save public money;
- To reduce the direct harm to the individual caused by social stigma; and
- To allow the detainee to maintain, as far as possible, a 'normal' lifestyle within his own family and familiar surroundings, and within the terms of custody designated for him.

Following these principles of harm reduction, normalisation and personalisation, participation involves 'a customised personal monitoring regime, tailored for each early-released prisoner (i.e. on judicial conditions), according to their personal characteristics, the type of the offenses committed, and rehabilitative needs' (Shosham *et al.*, 2014a: 5). In Shosham and colleagues' research (2013), the study group were released on licence after two thirds of their sentence to serve the rest of it in the EM programme, which includes the expectation of 'constant employment' and home detention curfews typically starting at 8:00pm or later. Restrictions determine who can participate in this EM programme, excluding those convicted of sexual crimes, drug dealing, and domestic violence (Shosham *et al.*, 2014a).

The study group were compared with a control group of prisoners who served the full-term of their incarceration. During their participation in the Israeli EM programme, the recidivism rates of the study group were low – at around 10% (Shosham, Yehosha-Stern and Efodi, 2013). However, the research also found that re-arrest and re-incarceration rates remained low over time for the study group, offering a clear point of difference with that of the control group. By the end of a four year follow-up period, 42% of released prisoners among the control group were re-incarcerated (Shosham *et al.*, 2014a). However, in the same period of time, only

15% of the study group of EM prisoners released on licence were re-incarcerated (Shosham *et al.*, 2014a). The results were different for the two groups in terms of rates of re-arrest over time, with 62% of the study group avoiding re-arrest by the end of the fourth year (after the completion of the EM programme), compared to 49% of the control group avoiding re-arrest in the same period of time. Overall, the research findings indicate that Israeli EM programme participants have lower rates of re-arrest and re-incarceration compared to control group counterparts. However, the extent to which this can be associated with or attributed to electronic monitoring is less clear, because the programme also involves supervision and positive supports and factors (e.g., employment) associated with desistance from crime.

To summarise and reiterate, where the efficacy of EM is demonstrated, it must be understood as contingent and conditional. A central contribution of this Review is to underscore the fact that, despite mixed evidence and diverse perspectives internationally, some approaches do seem to achieve their intended impact and do appear to be linked with reductions in re-offending and non-compliance – yet any improvements or 'successes' cannot be attributed to EM alone where its use is integrated with other surveillance, supervision and supports.

4.4 Desistance from Crime

Whether EM can be said to actively 'support' or enable processes of desistance from crime and community reintegration, or whether it can be simply said that EM is used in ways that are comparatively less inhibitive of such processes (relative to more punitive sanctions such as incarceration) is the subject of ongoing debate (Lilly, 2006; Mair, 2006; Nellis, 2006b, 2014a; Deuchar, 2010, 2011; Geoghegan, 2012).

User Views: Perspectives of Monitored People about EM and its Impact on Desistance Processes

A core tenet of desistance scholarship is the importance of understanding the perspectives and experiences of people in processes of desistance from crime. With some exceptions, this continues to be a knowledge gap in the extant international literature on EM. Different international perspectives suggest a mixed response from monitored people, implying that electronically monitored punishment is preferred over imprisonment, yet EM has its own 'pains' and challenges and may be experienced as punitive and controlling (Andersen and Andersen, 2014: 356; Gainey and Payne, 2000; Jorgensen, 2011; Martin, Hanrahan and Bowers, 2009; Nellis *et al.*, 2013; Paterson, 2007; Payne and Gainey, 1998, 2004; Vanhaelemeesch, Vander Beken and Vandevelde, 2014).

As highlighted earlier, Hucklesby's research (2008, 2009, 2013a, 2013b) canvasses the views of monitored people in England and Wales to explain the dynamics of how EM can help or hinder desistance processes, as well as short- and long-term compliance. Her research suggests that electronically monitored curfew orders may be a contributing factor to desistance in two ways:

(1) Decreasing levels of anti-social capital by reducing offenders' links with situations, people, places and networks correlated with their offending; and

(2) Improving levels of pro-social capital by encouraging offenders to connect or re-connect with influences linked with desistance, such as family and employment.

(Hucklesby, 2008: 51)

The structure of EM curfew orders can bring a level of normative routine and increased responsibility for some monitored people whose lives were previously characterised by rapid change and impulsive decisions. Conversely, for some, instability and impulsivity may contribute to breach of the conditions of an EM order. In Hucklesby's research, some interviewees indicated that, during their time on an EM curfew order, they had 'grown up' or grown out of offending and had used this period to change their lifestyle (Hucklesby, 2008: 60). This shift in life-course trajectory can be explained by ontogenic desistance theories and research which

highlight the influence of ageing and developmental processes of maturation in leaving crime behind (Gottfredson and Hirschi, 1990; Halsey and Deegan, 2015).

Research on the Israeli EM programme described earlier in this Review included an anonymous qualitative questionnaire to ascertain the perspectives of 75 released prisoner participants about EM. Four areas were investigated by Shosham, Yehosha-Stern and Efodi (2014b: 162-164), each of which bear some relevance to reintegration and desistance:

(1) *normative perceptions*, e.g., "work helps me feel like everyone else" and "I feel that I belong to society outside prison";

(2) *negative aspects of EM*, e.g., "because of the bracelet, I feel like I am still in prison" and "I am ashamed to be seen in my environment with an electronic bracelet";

(3) *positive aspects of EM*, e.g., "the relationship with my spouse has improved since I was released under electronic monitoring" and "the electronic tag helps me not fall back into a life of crime"; and

(4) *future expectations*, e.g., "I believe I will succeed in life" and "I believe that once the EM period is finished, I will be able to find a regular job."

Overall, the research findings show that participants hold mostly positive views of EM and the rehabilitative aspects of the Israeli EM programme, as well as consistently positive expectations about their future and their capacity to desist (Shosham, Yehosha-Stern and Efodi, 2014b). The findings also showed lower levels of shame and stigma as a negative aspect of EM than were expected, based on earlier arguments in the literature that shame and stigma derived from EM would impede reintegration. These findings need to be interpreted in light of two factors. Firstly, they are the views of monitored people who have served at least one prison sentence and, as such, their perceptions of EM are implicitly or explicitly understood in comparison to its alternative – incarceration. Secondly, participation in the Israeli EM programme incorporates therapeutic service provision and positive factors (e.g., employment, social bonds and social capital) which may promote or support desistance.

The Impact of EM on Social Capital and Relationships in Desistance Processes

Social capital and the role of positive social bonds in stopping offending and changing identity are another focal point in desistance scholarship, encompassed within sociogenic desistance theories (see Maruna, 2001; Weaver, 2012, 2015). The findings of Hucklesby's (2008) research in relation to social capital and relationships with partners and significant others were mixed, with EM curfews and extended periods of time at home with family being seen as helpful for some offenders, but a source of strain or hindrance for others. This is consistent with wider research showing the varied impact of EM on social bonds, especially in the home – in other words, where relationships are already strong and positive, this may continue and grow during EM curfew orders, and where they are already strained or even violent, this may be exacerbated and may have undue impact on family members, who are not serving a penal sentence (Mair and Nee, 1990; Whitfield, 1997, 2001; Walter, 2002; Gibbs and King, 2003; Gibbs, 2004; Martinovic, 2007; Hucklesby, 2008; Vanhaelemeesch, Vander Beken, and Vandevelde, 2014). Overall, the findings of Hucklesby's research mostly indicate that EM curfew orders may be used as a vehicle for desistance in combination with other supports, however, they do not provide a basis from which broad generalisations can be made linking EM as a *cause* of desistance. Similarly, broad generalisations about the impact of EM on a monitored person's family ties and the impact for their family members are unhelpful.

Overall, in terms of desistance from crime, there are grounds for cautious optimism that EM may be one contributing factor (among others) to the desistance of some monitored people in the short term, albeit with the important recognition that factors other than EM are considerably more influential in helping them realise and sustain desistance in the long-term. This claim rests on the recognition that 'EM technology is not rehabilitative itself… but it can assist, and perhaps enhance, measures which are intended to be rehabilitative, and help offenders acquire the initial self-discipline necessary to stimulate desistance from offending' (Nellis, 2015: 12). While a broad spectrum of views exist, the literature tends to ratify the position that EM as a stand-alone measure may achieve some self-control and deterrent effects for its duration. Thus, it may be instrumental in promoting both 'formal compliance' and primary desistance, that is, technical compliance with the law and

the cessation of criminal offending in the short-term. These are related, but different to, 'substantive compliance' (active commitment and buy-in, pro-social law-abiding behaviour as normative) and secondary desistance in the long-term (see Robinson and McNeill, 2008; McNeill and Robinson, 2013).

To contribute to secondary desistance, EM needs to be used flexibly alongside other services and supports (including those beyond criminal justice, e.g., mutual aid groups, positive support from family or employers). Some authorities in Scotland and elsewhere use EM flexibly and through the lens of offering 'incentives' by lessening the number of curfew hours and/or days as recognition and reward for monitored people who demonstrate formal compliance in the initial stages of their EM order. Best (2009: 95) calls for a flexible and tailored 'a package of interventions' involving the use of technology 'to supplement and support humanistic approaches' – echoing the Scandinavian successes in pointing out that electronic approaches are 'not incompatible with rehabilitation.' Similarly, Nellis (2015) highlights the need for flexibility and multi-faceted supports in a report on EM for the Council of Europe, where he aligns supporting desistance with the sentencing aim of rehabilitation:

> If longer-term rehabilitation and sustained desistance is the intention, EM must be combined with other measures which address offenders' problems and criminogenic needs, and which support their inclinations to desist (allowing time for them to engage in employment or training). Spatial and temporal violations must be enforced more flexibly than in a purely punitive approach, taking account of compliance with other constructive measures and general progress towards desistance (Nellis, 2015: 16).

A determining factor is the extent to which the monitored person views EM as a catalyst to moderate their actions, in essence, using it as a form of motivation and self-discipline which positively reinforces their efforts towards pro-social change (Mair, 2006). It is not so much the deterrent or surveillant effects of EM that are associated with desistance, as it is the potential for motivation and choosing sustained compliance and pro-social change. Ostensibly, the impact of EM on desistance and reintegration remains contingent upon the lifestyle and social supports, as well as the available opportunities and circumstances, of the monitored person.

Weighing Up the Evidence: Summary of Key Points

- Overall, the EM programmes and approaches which are shown to reduce reoffending during and/or after the monitored period are mostly those which include other supervision and supportive factors (e.g., employment and education, social capital) associated with desistance. The effective approaches discussed here have developed on the basis of high levels of integration with supervision and support from Probation Officers and other staff and services. In other words, the more effective programmes and approaches, in Europe in particular, are those where EM is not a stand-alone measure.
- The effective approaches discussed here use tailored, and in some cases quite restrictive, eligibility criteria to determine who can participate in EM programmes. This affects how the impact of EM on recidivism, desistance and reintegration should be interpreted.
- A significant number of the major empirical studies conducted – mostly in North America and the United Kingdom – in the last fifteen years conclude that the efficacy of EM in reducing re-offending after it has concluded is modest or minimal. Whereas research from other countries – especially Scandinavian countries and some European countries – indicates more extensive effectiveness and positive impact.
- There is currently only limited empirical literature available which focuses on the perspectives and lived experiences of monitored people regarding issues of compliance (or non-compliance), legitimacy, and desistance from crime. More research is needed.
- Flexibility in the use of EM orders and conditions may foster motivation for monitored people to comply. The capacity to incentivise and reduce curfew hours and days (e.g., curfews from 7 days a week down to 5 days a week) as a form of recognition and reward for a monitored person's formal compliance in the initial stages of an order may positively affect their perceptions of the legitimacy of that order. More research on this is needed.

4.5 Victims' Perspectives and Involvement in Electronic Monitoring

Victim involvement in the use of electronic monitoring may take different forms. However, there remains a paucity of research about victims' perspectives and experiences of EM. Existing empirical knowledge is mostly derived from small qualitative studies conducted in Sweden and the United States, which are briefly described here. While very informative and useful, the generalisability of these studies in seeking to understand their findings as somehow representative of victims' perspectives is limited, especially because of the small sample sizes and the influence of bias in who chooses to respond or not respond, and why.

In Sweden, the perspective of victims and their advocates seems to have shifted over time; the Swedish Crime Victim and Compensation Authority originally expressed opposition to EM reforms due to a perceived lack of understanding of its impact on victims, but victims' perspectives of EM in Sweden have since been shown to be more mixed or even positive (Brottsoffermyndigheten, 2004 in Wennerberg and Holmberg, 2007; Wennerberg, 2013).

In one of the first studies of its kind, interviews were conducted with 39 victims (22 females, 17 males) where the offenders had been placed on ISEM or EM release, with a sampling preference for victims of violent crimes (ranging from assault to grievous bodily harm and attempted murder) and sexual crimes, to reflect the significant proportions of these types of offenders in ISEM or EM release (Wennerberg and Holmberg, 2007). In the research findings, among victims whose offender participated in EM release, the proportion of negative views of EM was equivalent to the proportion of positive views, with those holding negative views tending to state a belief that the sentence was too short (Wennerberg and Holmberg, 2007). A particularly interesting finding, given the proportion of participants in the study who had been the victim of violent and sexual crimes, was that most victims expressed the view that they did not feel unsafe during the period of EM release (Wennerberg and Holmberg, 2007). In fact, feelings of safety were increased with the knowledge that the offender was being monitored, and that alerts and protocols would be followed if they were breached the conditions of the order, as well as some stating a belief that ISEM and EM release were less harmful

than prison. Overall, 'the majority of the *interviewed* crime victims are positive to the offender serving a sentence at home with electronic tagging' (Wennerberg and Holmberg, 2007: 20; emphasis in the original).

Victim Involvement in Bilateral Electronic Monitoring

Although it is not currently used extensively, increasing numbers of European jurisdictions are piloting or incorporating victim *notification*, as well as victim *involvement* in bilateral electronic monitoring (BEM) (Nellis, 2013). Empirical information on this remains limited. This can be done using RF technology or GPS technology, or hybridised RF/GPS tags. In Scotland, there is currently the capacity for victim involvement through imposing 'away from' restrictions and exclusion zones which seek to reduce and prevent a monitored person from approaching that place, for example, a victim's house, or a small business. This is voluntary and requires the victim's consent; it is currently only used in a small number of cases. Depending on the jurisdiction, will depend on *who* is notified and when, for example, an alert may first be received by the EM services provider, by police, by probation, or by the victim themselves, or combinations of these people. Nellis and Lilly (2010: 362) describe how this works in a standard RF-based arrangement: 'The victim's home is equipped with a receiver sensitive to the signal from an offender's ankle bracelet [PID tag]; if the offender goes near the home, both the victim and the police are alerted'. This type of monitoring is limited to knowledge of whether the monitored person approaches the exclusion zone they are restricted away from, however, victims are likely to spend significant proportions of time outside of the monitored exclusion zone.

Where GPS EM technology is used, bilateral electronic monitoring can involve victims carrying (e.g., in a bag or pocket) or wearing (e.g., being tagged themselves) a device on their person, meaning the monitoring is not simply that of a place or property, but tracking the location of the victim themselves in real time. Paterson and Clamp (2014) describe the advent of bilateral EM as a major shift from EM as an offender-focused approach to surveillance and punishment, to BEM as a victim-centric approach which prioritises surveillance towards monitoring the victim in the

interests of their safety and protection, with their notification as well as notification of authorities, usually police, where alerts are generated.

In a 2005 study, Ibarra and Erez found mixed results which conveyed the opportunities and tensions of bilateral EM, whereas later research findings indicated more positive perceptions and benefits from victim involvement (Erez and Ibarra, 2007; Erez, 2009). Erez and Ibarra (2007) conducted interviews with 30 female victims of domestic abuse involved in bilateral EM, and 22 criminal justice professions who worked with victims. Numerous victims described the 'transformation' of their homes from a site of conflict to becoming a refuge and shelter with the advent of bilateral EM as victims' cumulatively developed a sense of safety over time, stating that they were better able to relax and experienced reductions in stress and fear (Erez and Ibarra, 2007: 108). Instead of hyper-vigilance, some victims reported that they, and their children where they were parents, felt able to 'resume a normal life' (Erez and Ibarra, 2007: 110).

In a report submission investigating the availability and appropriateness of technology required to establish an EM and victim notification programme in New Jersey, acting Attorney General John Hoffman (2014) argues that the use of GPS has promise, but it must be understood in terms of its limitations and constraints:

> The technology required… has limitations. Specifically, uncertainties about the technological functions and application may hinder effective operation at any given time, including: is the monitoring device receiving a GPS and cellular signal; is the device charged and working properly; is the victim carrying the device; did the offender approach the victim intentionally or unintentionally; does the victim know the quickest route to safety; can law enforcement arrive in time? All technological functions must operate flawlessly and must be seamlessly coordinated with the victim's and law enforcement's response to enhance the victim's safety (Hoffman, 2014: 2)

These issues are explored and discussed in more detail later in this Review.

4.6 Media and Public Opinion about Electronic Monitoring in Other Jurisdictions

There is limited research internationally on public attitudes toward and media representations of electronic monitoring. The study conducted about public perceptions of sex offenders, including the use of EM, in Florida (Levenson *et al.,* 2007*)* discussed in Section 3 of this Review is an example of an exception.

As Nellis (2007) has documented through an analysis of media coverage of the EM bail pilots, media discourses on EM in Scotland have been sceptical and negative, focusing on the leniency of tagging and the risk posed to the public through individuals charged with serious offences being subject to EM while 'success stories' have been ignored. In England and Wales, media representation of EM appears to have been more mixed, though overall still more negative than positive in its orientation. Perhaps more surprisingly, the introduction and expansion of EM in England and Wales was characterised by limited media debate and attention (Nellis, 2003).

Finn and McCahill (2010) analysed media representations of people as the subjects of different types of surveillance, including 155 articles on electronic monitoring as well as intensive supervision and surveillance programme (ISSP) orders for young people, in three UK newspapers over the course of a decade. They found that the targets of surveillance were overwhelmingly described and labelled in terms of their offending behaviour, being negatively constructed as 'Others' through the consistent use of terms like 'criminals' and 'tagged offenders'. Their study showed the use and construction of 'bad' surveillance and electronic monitoring technologies that can target 'them', differentiating, for example, between the tagging and monitoring of offenders and the use of CCTV (in this instance, a 'good' technology) on a public road to target and enable 'us' (Finn and McCahill, 2010: 27). However, a small level of ambivalence was observed in the data about electronic monitoring schemes, for example, 'where one person subject to the scheme described it as "a strange kind of freedom" (*The Guardian*, 22/11/00)' (Finn and McCahill, 2010: 9).

In contrast to its generally negative depiction in the UK media, the Swedish media tend to be relatively positive about EM despite some initial concerns by media

commentators that it was not sufficiently punitive, was only suitable for people in relatively stable social circumstances or would result in a mechanistic approach to supervision (Wennerberg, 2013). It has been suggested that media support for EM was facilitated by a proactive and clearly defined media strategy by the Probation Service, by the absence of serious incidents involving monitored persons (because EM was targeted on low risk cases) and by the gradual introduction and evaluation of EM with different target groups prior to national implementation (Wennerberg, 2013). Similarly, the majority media representation of EM in Norway has been described as positive, following close liaison between the Ministry and media broadcasters before and during the implementation of the EM pilot (Kylstad Øster and Rokkan, 2012). Its positive reception by the media and the public is remarkable in light of the initial opposition by minor political parties in Norway, where the original decision to start an EM pilot in Norway was described as 'controversial' (Kylstad Øster and Rokkan, 2012: 90).

Some research in the Unites States and Europe has aimed to explore public attitudes towards EM, though these studies have tended to use samples of [usually criminal justice] students which means that their wider generalisability is unclear. Research in the United States has indicated that attitudes to EM may vary according to demographic characteristics of respondents such as ethnicity and gender. Payne *et al*. (2009), for example, found that respondents from non-white minorities had more negative views of EM, reflecting perceived inequalities in its use with different ethnic groups.

A survey conducted in England and Wales on wider public attitudes to electronically monitored curfews indicated low levels of spontaneous awareness of the penalty among the public. Once the nature of EM curfews had been explained to respondents, the majority were reasonably supportive of its use with and ability to control certain categories of people – in particular those who were unemployed, in full-time education, under 16 years of age, mothers and 'persistent offenders' – and for a range of crimes including burglary, shoplifting, sexual offences, drug dealing, harassment, violent and public order offences, drink driving, deception and theft (TNS and Harris, 1999 cited in Nellis, 2003).

Maljević and Muftić (2014) found, as did Payne *et al*. (2009), that students surveyed on their attitudes towards EM (in this case in Bosnia and Herzegovina) did not have strong opinions about the measure. They tended, however, to agree that EM could be a cost effective alternative to imprisonment and could help to promote reintegration by enabling monitored persons to remain in the community (see also Gainey and Paine, 2003), but fewer believed that EM could reduce re-offending. Respondents in this study, who in general did not regard the conditions associated with EM to be particularly onerous, were particularly supportive of the use of EM at the pre-trial stage and with juvenile offenders, and less supportive of its use with violent or sexual offenders.

There is some evidence – albeit limited – that public attitudes towards EM can develop and change in association with the provision of educational information. In a study conducted in Virginia, criminal justice students' attributes were measured before and after a guest lecture on EM and they were found to have more positive attitudes towards it following the educational input. More specifically, respondents regarded EM 'as more punitive, as an effective deterrent or method of control, as a rehabilitative tool, as cost-effective, and as effective for family- and work-related reasons' (Gainey and Payne, 2003: 203). It is unclear, however, how much and what types of information the public in Scotland (and elsewhere in the UK) would require in the light of negative media depictions of EM for meaningful changes in attitudes towards EM to be achieved.

5. Comparing Electronic Monitoring Technologies

In Section 5, we provide bounded analyses of the EM technologies of GPS and Remote Alcohol Monitoring, focusing on their strengths and limitations, and highlighting associated legal and ethical implications. The latter part of Section 5 presents international data regarding the costs of different types of electronic monitoring technologies and modalities, with a particular emphasis on jurisdictions in Europe and the United States.

5.1 Global Positioning System (GPS) Tagging and Tracking

Introduction

This sub-section builds on the international evidence and experience presented throughout Section 3 on 'The Purposes and Uses of Electronic Monitoring' and Section 4 'The Impact of Electronic Monitoring' of this Review regarding the use of GPS-based monitoring. In accordance with the brief provided by the Scottish Government, the scope and aims of this Review are to: consolidate what is known about the efficacy, reliability and accuracy of GPS monitoring, especially where comparisons are available to RF monitoring; to clarify whether GPS data has been used in court; acknowledge legal issues and ethical implications involved in the introduction of GPS; and draw on the experiences of other jurisdictions to consider the uses, resource intensity and costs of GPS monitoring.

As it currently stands, data generated from RF-based EM can confirm the presence of absence of a tagged person in the place they are restricted to, in the instance of a curfew, or a place they are restricted away from. There are limitations on how big this 'place' in terms of an exclusion zone or inclusion zone can be, which are determined by the range of one or more Home Monitoring Units (HMU) boxes, which rely on mobile phone sim cards and network coverage or, where this is unavailable, use a landline. RF electronic monitoring does not 'track' monitored people, as such it does not yield information about where a person is outside of the

hours of their curfew, where one is imposed, and outside of the location of the monitored area. There are currently time limits, for example 12 hours, on the maximum length of curfew that can be imposed using RF through a restriction to a place. In light of this, the next sub-section provides a circumscribed overview of the strengths and capacity of GPS monitoring, which has some similarities to RF, but also has the capacity to track monitored people.

GPS Monitoring: Potential Strengths and Benefits

Different approaches can be taken to GPS monitoring. *Active* GPS monitoring describes an approach where continuous location monitoring information is relayed to a monitoring centre in real time, at designated intervals that can be set by the centre (e.g., every 10 seconds, 30 seconds or 2 minutes). Where a satellite signal is lost, Wi-Fi positioning systems and GSM location based services enable a monitored person's location to be established through triangulation between mobile phone masts (sometimes called 'towers'), without requiring the monitored person to connect the GPS tag with a docking device or have a landline connection (Geoghegan, 2012). The limitations or 'disadvantages' associated with this are that it still relies on the availability of signal, it is labour and resource intensive, and may involve a certain level of 'liability' for supervising officers and agencies based on the requirement of immediate response in the event of a violation alert (International Association of Chiefs of Police, 2008). By comparison, *passive* GPS monitoring collects the same location and time data, but it is stored within the GPS EM equipment, and is downloaded usually on a daily basis. It can be routinely retrospectively checked by supervising officers who wish to check compliance or non-compliance after the fact. This approach is perceived as less labour intensive, however, passive monitoring will not generate an immediate alert in the event of an exclusion zone violation (International Association of Chiefs of Police, 2008). *Hybrid* GPS monitoring approaches are possible, and these involve the combination of both passive and active technological capabilities, can the intervals at which they report data can be programmed on an individualised basis as to the frequency of which monitoring information is relayed to the monitoring centre.

There are a few strengths and benefits highlighted in the literature regarding the use of GPS tagging and tacking, several of which have already featured in discussions in Sections 3 and 4 of this Review. Its use is associated with moderately high levels of compliance for the duration of the period of monitoring, and it may act as a deterrent to re-offending because it has the capacity to yield more detailed information than RF regarding a person's location in real time (Bales *et al.*, 2010; Gies *et al.*, 2012; Padget, Bales and Blomberg, 2012; Scottish Government, 2013a). This can be understood in terms of instrumental compliance and surveillance-based compliance (Hucklesby, 2009), as discussed in Section 4. Its impact on recidivism or desistance in the mid- to long-term after monitoring has finished is less clear, due to a lack of empirical literature. Secondly, the use of active GPS and 'away from' restrictions around the property and person of a victim can enhance authorities' capacity to respond quickly should a high risk monitored person breach an exclusion zone. Another potential strength is its capacity to contribute relevant information to integrated and multi-faceted risk management within offender supervision. In discussions of the potential use of EM in England and Wales, Geoghegan (2012: 77) suggests that either GPS or combined RF/GPS could be used with offenders who have been assessed as medium and high risk within Multi-Agency Public Protection Arrangements (MAPPA). Prisons may be more willing to grant HDC's if they know that the prison, as the authorising agency, will have swift access to location-based information and violation alerts. On the other hand, HDC's are only routinely granted to prisoners who do not pose a significant risk to public safety, so it is also possible that GPS may have limited impact.

Although it continues to attract considerable attention among policymakers, practitioners and academics around the world, the use of GPS-based monitoring is not as widespread as RF-based monitoring. GPS-based monitoring is not commonly implemented as a jurisdiction-wide total replacement superseding other forms of EM technologies. RF monitoring is more accurate and effective than GPS in monitoring the perimeter of the size of domestic homes, so is the more reliable technology where a curfew is involved. As was established in the Scottish Government (2013a) consultation, GPS tags can also detect RF signals, meaning that one device can use both systems. Geoghegan (2012: 27) describes this type of combined RF/GPS tag as 'increasingly common, allowing GPS devices to communicate with home monitoring units, sometimes known as RF beacons, that

might be installed in a probation office, treatment centre, a workplace or the offender's home address.' In light of this, if GPS is introduced and deemed as necessary in the surveillance of certain offenders or offence types, arguably there is no need to abolish the concurrent use of RF in Scotland, as it is already in use and working effectively for the purposes it is intended.

GPS-based Monitoring of Sex Offenders and Domestic Abuse Offenders: Impact and Effectiveness

To summarise and reiterate, in Sections 3 and 4, this Review of the international evidence and experience regarding the uses, effectiveness and impact of GPS tagging and tracking with sex offenders has already established that:

- Despite some emergent positive research findings of the impact of this technology during the period of monitoring, there remains a significant lack of empirical evidence to support the positive impact of GPS-based monitoring of sex offenders in terms of increasing compliance, reducing re-offending and enabling desistance and reintegration (Armstrong and Freeman, 2011; Bishop, 2010; Cohen and Jeglic, 2007; International Association of Chiefs of Police, 2008; Renzema and Mayo-Wilson, 2005);
- Where research has shown that GPS-based monitoring of sex offenders has been associated with benefits and positive impact, EM is usually integrated with other surveillance, supervision and risk management, and supports (Cho and Kim, 2013; Geoghegan, 2012; Payne, DeMichele and Button, 2008;);
- Where it is used on a mid- to long-term basis, GPS-based monitoring of sex offenders may be less cost-effective and less easily ethically defensible, in that it can cost more than other electronic monitoring technologies such as RF and 'standard' probation supervision, although it remains cheaper than prison, yet it may not realise significant reductions in re-offending and may have unintended consequences in the lives of monitored people (Osmori and Turner, 2012; Lilly and Nellis, 2013; Payne, DeMichele and Button, 2008; Wennerberg, 2013). However, findings on the grounds of fiscal efficiency are mixed; some US studies state that GPS monitoring of sex offenders is cost effective (Gies *et al.*, 2012).

Additionally, Sections 3 and 4 of this Review of the uses, effectiveness and impact of GPS tagging and tracking with domestic abuse defendants and offenders has shown that:

- There has been growth in the use of GPS tagging and tracking in places like the United States, Spain and Portugal, with both criminal justice and civil – in the form of EM restraining orders – pilots and initiatives specifically designed for perpetrators of domestic abuse (Ibarra, 2005; Ibarra, Gur and Erez, 2014; Malone, 2013; Ministry of Justice [Portugal], 2013). A considerable number of these initiatives use GPS EM at the pre-trial stage, to reduce the use of remand (imprisonment) while ensuring surveillance forms a part of tailored risk management within the granting of bail;
- Limited available research from the US suggests that pre-trial GPS monitoring of domestic abuse defendants is more effective, in comparison to RF EM, in reducing violations and promoting compliance (Erez *et al.*, 2012);
- Professional ideology and institutional orientations affect the use and impact of GPS monitoring technology, with motivational and collaborative approaches yielding different results to punitive approaches (Ibarra *et al.*, 2014);
- Bilateral EM is becoming a feature of discussions about victim participation in the EM of domestic abuse offenders, and while victims hold a diversity of positions on this, it seems to attract mostly positive responses (Erez and Ibarra, 2007; Erez, 2009; Erez *et al.*, 2012). The empirical evidence and criminological literature on GPS-based bilateral EM is limited and relatively new, and it is too early to make strong claims about its impact, and comparisons to RF EM, on compliance, reducing re-offending and enabling desistance in the mid- to long-term after their EM order has concluded.

Similarly, several of the responses from key stakeholder agencies to the Scottish Government (2013a) consultation on EM welcomed the introduction and use of GPS monitoring in domestic abuse cases where victims may feel more confident or assured knowing that an exclusion zone around their property and, if they carry a device, around them is being monitored. However, both the international literature and stakeholder responses tend to recognise that this technology is not fail proof, and its potential introduction should coincide with awareness raising to thwart false

expectations of the capacity of GPS EM to directly stop re-offending or risk to victims.

Limitations, Practice Considerations and Unintended Consequences

GPS technology has certain limitations which can affect the implementation and operation of this type of EM:

- *Battery Life:* Despite advances in GPS and battery technology, GPS tags 'would need to be charged daily' using an 'on body charger' for a period of approximately 1 - 1.5 hours a day (Scottish Government, 2013a: 18). At one level, this is not entirely dissimilar to normative habits for most users of smart phones and tablet technology which with daily use require charging every day or every few days. At another level, given the likelihood of sanctions for failing to charge the battery, and the 'on body' charging element, the duration of an EM order or licence does need to include consideration of the time commitment and onerousness of this daily requirement, which is not a feature of RF EM. Conversely, for those who wish to defy or obfuscate the system, a 'flat battery' alert and period of being unmonitored may be intentionally used by some to go to places and do things that they do not want authorities to detect.
- *Loss of Signal:* The accuracy and effectiveness of GPS tracking is known to be affected by a number of circumstances, including common places and circumstances where it may not work, including: some buildings larger than domestic private dwellings (which might include large conjoined, multi-story residential buildings), nearby tall buildings, on trains, and underground (which would likely include the Glasgow subway) (Scottish Government, 2013). There is the capacity to combine GPS with the use of other technologies, such as Wi-Fi positioning systems and GSM location based services, to establish a monitored person's location through triangulation between mobile phone masts (sometimes called 'towers') in the event that GPS signal is lost (Geoghegan, 2012; Scottish Government, 2013a). However, the accuracy and reliability of both technologies working consistently across Scotland, including in cities, in train tunnels and as far as remote islands, warrants further close scrutiny, and still presents a system that is fallible and yet can have serious consequences for

monitored people. These raise legal issues and ethical questions about equality and the impact on monitored people, especially prisoners and parolees who cannot accrue violations, who would be expected to avoid circumstances where GPS signal and mobile phone coverage could be lost.

- *Deliberate Disruption of GPS Signals:* Jamming and shielding the signals used by the GPS EM equipment is possible (Geoghegan, 2012). This can, in part, be addressed by adding such behaviours to breach criteria; however, EM services providers need to have the capability to prove or confirm that jamming or shielding the signal has occurred, compared to loss of signal, which can also be relatively common but constitutes a circumstances that has not been caused by the monitored person themselves.

- *GPS Drift and Circumstances Affecting Accuracy:* Various authors acknowledge that there are some limitations where GPS 'drift' occurs, notably where a monitored person's GPS tag stays static for an extended period of time or where they are on or in close proximity to a body of water (Scottish Government, 2013a; Geoghegan, 2012).

Other critiques and collateral consequences are more keenly observed at the levels of institutions and systems:

- *Net-widening:* In light of the burgeoning uses and impact of GPS EM in places like the United States, *t*he ethical concern of net-widening is a major challenge to the widespread use of GPS monitoring, particularly where monitored people would have otherwise completed their order and involvement in the criminal justice system if it were not for the EM condition. Efforts to reduce mass incarceration and high prison populations in Western jurisdictions are counter-productive where they are also associated with the growth of mass supervision and surveillance.

- *Increased Workload for Criminal Justice Practitioners and Agencies:* Several commentators have challenged the notion that EM makes it easier to monitor offenders, instead arguing that the use of EM has a negative impact on workload for probation and parole staff (for discussions of this in relation to sex offenders, see Armstrong and Freeman, 2011; DeMichele and Payne, 2007; Payne and DeMichele, 2010).

- *Costs and Resource Intensity of Increased Detection of Non-Compliance:* GPS EM can identify non-compliance and breaches that previously went undetected or were hard to monitor, which is listed as a strength in the Scottish Government (2013a) EM consultation. Nonetheless, Geoghegan (2012: 31) points out that this is a factor 'driving costs rather than reducing them, especially if the process for dealing with a breach is lengthy, bureaucratic and lacks the confidence of supervisors, offenders and the public.' Regarding the latter comment, the perceived legitimacy and procedural justice of a penal sanction, including responses to non-compliance and breach, bears relevance to the motivation and compliance of monitored people.

5.2 Legal Issues and Ethical Implications of GPS Tagging and Tracking

Electronic Monitoring Technologies, the Principle of Proportionality and Differential Impacts

Nellis (2015) raises two inter-related points about the ethics of GPS and RF monitoring that are worth mentioning here. The first relates to the principle of proportionality in criminal justice. He argues that the type of technology (RF or GPS) and the duration of surveillance and supervision need to be proportional to the seriousness of the offence and the level of risk posed by the offender, with continuous GPS tracking reserved for examples such as 'a high risk sex offender… upon their release from prison' (Nellis, 2015: 13). Following principles of proportionality, as well as those espoused within the empirically well validated and internationally used Risk-Need-Responsivity (RNR) correctional model of offender rehabilitation, it is unwise and ethically questionable to target low risk offenders with intensive and invasive criminal justice interventions and surveillance. The ethical caveat about restricting the use of GPS monitoring with types of offences and offenders where there are clear justification and likely benefits (including the management and reduction of risk) is reflected in several of the responses by key stakeholder agencies to the Scottish Government (2013a) consultation on EM.

Simultaneously, Nellis (2015) advocates for the need to be reflexive, unsettling taken for granted assumptions about the differential impact of types of EM technologies on monitored people:

> It is often taken for granted that because GPS tracking is more obviously "intrusive" than the presence monitoring enabled by RF EM – it can subject the offender to continuous monitoring and generates a much greater amount of information – that it should always be used with more serious, higher risk offenders. There is cogency in this view… However, the idea that GPS tracking is inherently more "intrusive" than RF EM may be misleading: notwithstanding the greater amount of data that GPS generates, and the behavioural inferences that may be drawn from this, some offenders may experience this as *less* "intrusive", because it permits movement rather than requires confinement at home (Nellis, 2015: 27-28).

This highlights the need for more research to ascertain monitored people's perspectives and experiences of the different technologies, and how they are perceived in terms of their capacity to help or hinder compliance, desistance and reintegration.

Police Involvement, Inter-Agency Information Sharing and Using EM Data in Criminal Investigations and Court

In some jurisdictions, including regions within England and Wales and some US states, police either oversee the operation of, or have ease of access to data about, the electronic monitoring of offenders, especially GPS-based EM. Where an EM initiative is not police-led, the existence of surveillance data generated by GPS tracking may attract increased requests by police for access to that data. Swift access to information on the whereabouts of monitored people may appeal for its potential to save police time and money that would otherwise be required for routine investigation procedures to ascertain the same information. Nellis (2015: 11) expresses concerns that some 'police may come to value the intelligence-gathering, investigative capacities which GPS enables', that is the savings and benefits for police under the rubric of public protection and helping the public purse, more than its capacity to 'assist compliance' and reductions in re-offending by monitored people. A balance of the interests, rights, responsibilities, protections and restrictions

incumbent on different stakeholders should be predicated on the legislative basis underpinning EM.

In the event that police do obtain the location of a monitored person for the purposes of a criminal investigation, GPS-based electronic monitoring still does not directly prove nor disprove whether a monitored person has committed a new crime, and it does not have the capacity to confirm whether or not others are present, unless they too are GPS tagged. It simply locates the monitored person at a given point in time, which may or may not coincide with the timing and location of a crime. In the United States, GPS monitoring tools and systems, and the data generated from these, are used in court processes (International Association of Chiefs of Police, 2008). This includes as evidence; for example, Geoghegan (2012: 64) refers to a case from Washington, D.C. of information sharing between courts, police and offender supervision enabling them to place a tagged sex offender at the time and location of two sexual assaults on teenage girls, leading to that offender's arrest and re-conviction. Geoghegan's (2012: 64-65) analysis for the Policy Exchange in England and Wales, a report which is heavily oriented in favour of police involvement and leadership in EM (also reflected the foreword, which is written by the Former Assistant Chief Constable of Hertfordshire Police), frames this as beneficial in terms of 'fighting crime' and providing evidence to enable arrests and re-convictions. He goes further to contend that mapping of 'crime scene correlation – in which locations of reported crime are overlaid on a daily basis against offenders' movements – should be a key feature of new [EM] programmes' (Geoghegan, 2012: 65). Both Geoghegan (2012) and Nellis (2013b: 203) acknowledge that some (but not all) monitored people may exert legal pressure to use this data correlation to 'exonerate rather than incriminate them.' These positions have been contested by the views of other stakeholders in Scotland, as will be discussed further in the next sub-section.

The International Association of Chiefs of Police (2008: 9) raises a series of legal questions and potential implications from a law enforcement perspective in their guidance to US police agencies involved in the GPS monitoring of sex offenders. These points are presented with regard for the moderate number of US states where GPS has been legislated as *mandatory* (in some US states, for life) or authorised for people who have committed sexual offences. Despite existing practices and

instances of use of GPS-based EM in courts, the International Association of Chiefs of Police still emphasise the likelihood that the legitimacy of this data may be questioned or challenged in adversarial court proceedings.

Legal Questions

- How will courts view cases involving a failure to respond to an alert that results in a new crime?
- How will courts view cases involving a new crime committed when the radio signal is lost or during equipment malfunction?
- How will courts view the admissibility of location data points and reports from GPS vendors?
- How will courts rule in privacy rights challenges?
- How will courts decide on potential issues of cruel and unusual punishment?

Public Expectations

- Due to a limited public understanding of what GPS monitoring can accomplish, there is potential for a false sense of security. The public may not realise that offenders can tamper with ankle devices or render them inoperable. Additionally, there may be a time lapse between an alert notification and agency response.

Source: International Association of Chiefs of Police (2008: 9).

GPS-based monitoring involves a considerable increase in the amount of data generated, and a commensurate increase in workload for all those tasked with cataloguing and responding to violations and breaches (International Association of Chiefs of Police, 2008; Geoghegan, 2012). Some of the points above, as well as those raised by Geoghegan (2012), underscore issues of duty of care, public protection and the perceptions of the media, the public, victims and the judiciary in the event that the police and other statutory agencies involved in EM *did know*, or *could have known*, information about a monitored person who breached the conditions of their order or licence and committed new crimes while being tracked, or following the removal of their GPS tag.

As it currently stands in Scotland, police do not routinely have ease of access to this type and level of data for people serving other penal sanctions (e.g., fines, unpaid work/community service and Community Payback Orders), nor for people monitored using curfew and RF-based EM. If GPS-based monitoring is introduced alongside the greater use of 'away from' restrictions, further clarification may help to delineate the primary role of Police Scotland. This role could range from being one of *responses* to alerts (e.g., a GPS tagged offender enters the exclusion zone surrounding a victim's property) and breaches (e.g., recall of prisoners who have breached their HDC conditions to prison) which are prompted or called for by others (e.g., G4S, Scottish Prison Service), or it could be extended to one of more routine and *proactive engagement*, or in the case of some regions in England and Wales *leadership*, in inter-agency work and information sharing (i.e. access to data) with the EM services provider and authorising agencies.

If police involvement in inter-agency work and information sharing is to expand with the introduction of GPS-based EM, this needs to be considered in light of potential differences in professional ideologies and priorities between, for example, police officers and criminal justice social workers overseeing offender supervision. Furthermore, if GPS-based bilateral EM is used in Scotland, this will necessarily involve the police in the form of responding to respond to alerts where there is a need for victim protection. It is beyond the scope of this Review to comment on the current or potential future role of Police Scotland, except to emphasise that police involvement has been highlighted (including by police themselves) in discussions of the experiences of other jurisdictions and the Council of Europe ethics guidance (Nellis, 2015) as a relevant consideration.

Privacy, Data Protection and Human Rights

Directly connected to the discussions above, there needs to be more in-depth consideration regarding potential legal and ethical challenges to the introduction of GPS monitoring in Scotland. Legislative amendments or new legislation associated with any changes to or expansion of EM in Scotland will need to fit with other existing legislation and conventions regarding human rights and data protection within Scotland, as well as with regard to the rulings of the European Court of

Human Rights (ECHR) about the privacy and human rights of offenders. Nellis (2014b: 28) notes that clear warnings have been made by the Law Society of Scotland (2014) and the Information Commissioner's Office (2014) about the impact of GPS tracking on personal privacy, and the potential illegality of continuous real-time mapping of a monitored person's movements and crime scene correlation.

5.3 Remote Alcohol Monitoring (RAM)

Introduction

In its consultation on the use of electronic monitoring in Scotland, the Scottish Government sought views on the introduction of remote alcohol monitoring (RAM), either on a voluntary or compulsory basis (Scottish Government, 2013a). As stated in the Introduction, transdermal alcohol monitoring (TAM) involves the person being monitored wearing an anklet – sometimes referred to as a sobriety bracelet – which samples the insensible perspiration on their skin to detect the presence of alcohol. Other forms of remote monitoring include remote breathalysing which also requires a mechanism – such as video or voice recognition – for verifying that the breath sample has been provided by the person being monitored.

The consultation responses were generally supportive of the potential use of RAM with defined groups of offenders such as prolific drink drivers and those convicted of alcohol-related violent crime. Several respondents suggested that RAM might usefully enhance compliance with alcohol treatment and in some cases provide offenders with an excuse not to consume alcohol in situations where they may feel pressured to do so. Respondents also suggested that it might be used at a number of different points in the criminal justice process, including as a requirement of a community sentence or following release from prison. However it was also emphasised that RAM alone could not result in long term changes in behaviour and that it should be used in conjunction with relevant treatment and support services, while some respondents argued that it should be used only where there was clear evidence of a pattern of alcohol-related offending. In a few cases, ethical concerns were raised in relation to the criminalisation of behaviour which, while being a contributory factor, was not, in itself, the primary offence and the view most

commonly expressed was that RAM should be introduced on a voluntary (that is, statutory but consensual) basis, but with appropriate sanctions available in the event of non-compliance.

Some consultation responses stressed the need for further evidence regarding the reliability of the technology, its costs and its effectiveness. To address these concerns, this report summarises the international evidence and experiences regarding the use and effectiveness of RAM in criminal justice contexts. As Nellis (2015) has observed, RAM has been relatively little used in Europe in comparison with the United States where it is available in most states. By 2013, SCRAM – the most widely used transdermal alcohol monitor – was being employed in 49 states. It was introduced in Canada 2010 and has been piloted in Victoria, Australia, London and Scotland.

In accordance with the brief provided by the Scottish Government, the scope and aims of this sub-section of the Review are to:

- Describe how remote alcohol monitoring (RAM) has been used in other countries to support reductions in alcohol-related offending, the type of offenders targeted and how it has been implemented;
- Examine the reliability and accuracy of transdermal alcohol monitors at detecting drinking episodes compared with other methods of monitoring alcohol consumption
- Assess whether there is evidence that RAM has an impact in terms of reduced alcohol consumption, desistance from crime (in the shorter and longer term) and/or improved health outcomes;
- Consider how RAM would fit with existing legislation in Scotland and whether there would there be any structural or ethical implications associated with its use;
- Consider how RAM might work in Scotland and the likely resource and cost implications.

Where appropriate – for example in comparing accuracy, reliability and advantages/disadvantages – consideration is given both to remote breathalysing and

to transdermal alcohol monitoring. However, in view of its increasingly widespread use and perceived advantages over other forms of remote monitoring technology, particular consideration is given to the effectiveness of transdermal alcohol monitoring (TAM). We have not included in this review methods of monitoring alcohol use which are not remote, such as regular breathalysing of the offender in person at their home or at a probation office or other agency office.

Given that the greatest use has been made of RAM (including TAM) in the United States, the majority of studies regarding its reliability, accuracy and effectiveness are from North America, although research and relevant material from other jurisdictions have been drawn upon where available and appropriate.

The Use of Remote Alcohol Monitoring in the United Kingdom

The London Compulsory Sobriety Project was launched in July 2014 in four South London boroughs, targeted for use with people sentenced by the courts for alcohol related offences – excluding those convicted of domestic violence or already subject to a community order for domestic violence – to an Alcohol Abstinence Monitoring Requirement (AAMR) as part of a Community Order or Suspended Sentence Order for up to 120 days. The new sentencing power was introduced through the *Legal Aid, Sentencing and Punishment of Offenders Act 2012*. Violations of the requirements can result in the monitored person being fined, being made subject to further requirements or having the requirement revoked and being re-sentenced, with persistent violations likely to result in imprisonment (Mayor of London's Office, 2014). The pilot has been in existence for less than 12 months preventing any firm conclusions from being drawn about its operation and effectiveness, although some interim data on its operation during the first six months is available (Pepper and Dawson, 2015), with a final report due in the autumn of 2015.

Over the first six months of the pilot, a total of 51 AAMRs were imposed for an average of 79 days, 26 of which had been completed. The requirements were most often made for drink driving and violent offences, with around one third imposed for offences related to the night-time economy. Stakeholders involved in the delivery of the pilot were largely positive about its introduction and operation and supportive of its wider rollout and offenders, while critical of the appearance and practicality of

the anklet, believed that they were capable of adhering to the condition and completing their order (Pepper and Dawson, 2015).

A pilot into the use of RAM with released prisoners was introduced in Scotland in 2013 by a team of academics working in conjunction with the Scottish Violence Reduction Unit. The pilot was undertaken following an earlier study of students which indicated that wearing an anklet reduced alcohol consumption by enabling them to resist peer pressure to drink, by serving as a reminder of their commitment to sobriety and by making them feel under surveillance (Neville *et al.*, 2013). Prisoners nearing the end of their sentences who believed that RAM could help them to address their alcohol consumption and reduce their likelihood of recidivism were randomly selected to wear an RAM anklet or not. While all of the prisoners who participated in the trial on their release were asked not to consume alcohol, there were no legal sanctions available should they elect to do so. In practice, 10 out of 11 of those who were monitored withdrew from the trial within one week, usually by cutting off the anklet and in the remaining case the ex-prisoner wore the anklet for 40 days before the battery ran out. The trial was discontinued 'due to the high rate of participant withdrawal and loss of equipment' (Neville, 2013: 15).The absence of formal sanctions for non-compliance may have resulted in the high levels of non-compliance as, perhaps, did the absence of intensive treatment and support. Further testing of RAM in Scotland might usefully focus on its capacity to enhance compliance with treatment and support and the impact of appropriate, graduated sanctions in encouraging compliance with requirements of abstinence.

The Use of Remote Alcohol Monitoring in the United States

Many probation programmes in the United States require abstinence from alcohol consumption for offenders with a history of alcohol-related offences. Prior to more recent technological developments which enable the continuous monitoring of alcohol consumption through an anklet worn by the monitored person, alcohol consumption was monitored remotely by breathalysers, although a disadvantage of this method was that it only enabled monitored persons to provide breath samples when they were at home (McKnight *et al.*, 2012). In the United States, alcohol breath testing has been used as an element of random calling RF electronic monitoring since

the late 1980s but required voice verification or some other means of ensuring that the monitored person was providing the breath sample (Nellis *et al*., 2013) and there has been virtually no research into the effectiveness of this type of remote alcohol monitoring (Renzema, 2013).

Transdermal devices which both monitor the presence or absence of the monitored person at a particular location while transmitting transdermal alcohol readings have been available since 2003 (Renzema, 2013) including in Alaska where an initial pilot demonstrated that TAM was feasible in a harsh climate with a dispersed population and poor technological infrastructure (McKelvie, 2005). RAM is used in a variety of criminal justice programmes including DWI (Driving While Intoxicated) Courts where it is are considered an important element of the court programme. It is most commonly employed with repeat and/or serious DWI offenders in response to concerns about alcohol-related road deaths, alcohol-related violent offences and other offences – including 'quality of life' offences (such as breach of the peace) – where alcohol is deemed to be a contributory factor (McKnight *et al*., 2012; The Policy Exchange, 2013). Some US jurisdictions have extended the use of continuous alcohol monitoring to young people in the context of community initiatives (such as colleges and universities) and formal criminal justice diversionary programmes (Robertson and Marples, 2008). In most US jurisdictions where TAM is currently being used, some form of alcohol monitoring was in place prior to TAM becoming available and being added to the programme (McKnight *et al*., 2012).

In the South Dakota 24/7 Sobriety Project – which was initiated by a prosecutor in rural South Dakota in 1985 to deal with repeat DUI (driving under the influence) offenders (Larkin, forthcoming) – alcohol monitoring was introduced initially as a condition of bail for those arrested for DUI offences but subsequently expanded to include individuals arrested for other alcohol offences and for use as a conditional of suspended sentences, probation or parole (Larkin, forthcoming). TAMs tend to be used in rural parts of the state where offenders cannot easily access a breath testing centre (Larkin, forthcoming). Sanctions for non-compliance take the form of a short period in jail (or 'flash incarceration') typically for one or two days (Kilmer *et al*., 2013; Larkin, forthcoming).

While imprisonment – accompanied by return to or removal from the programme – is a potential outcome of non-compliance, in their case studies of TAM, McKnight *et*

al. (2012) identify other responses to failure to comply as including an extension of the period of alcohol monitoring or time on the overall programme and return to an earlier stage of a staged programme. In addition, TAM may be used as a sanction for failure to comply with other programme elements. It is generally agreed in the literature that there is a need for graduated sanctions and incentives to respond to both non-compliance and progress and that, in the case of the former, these need to be clearly defined and implemented swiftly and consistently.

The Types, Reliability and Validity of Transdermal Alcohol Monitoring (TAM)

Transdermal alcohol monitors measure the approximately 1% of ingested alcohol that is excreted following consumption through the skin (also referred to as 'insensible perspiration') by converting alcohol on the skin into an electric current the size of which is proportional to the alcohol concentration. The Traffic Injury Research Foundation in Canada has produced a practical series of guides on the use of TAM for criminal justice professionals (Robertson *et al*., 2006), practitioners (Robertson *et al*., 2007) and administrators (Robertson *et al*., 2008)

There are two main brands of TAM devices in commercial use. The most widely used TAM device is the Secure Continuous Remote Alcohol Monitor (SCRAM) which was developed by Alcohol Monitoring Systems (AMS) (n.d.) and consists of an anklet that provides transdermal samples every 30 minutes. The SCRAM bracelet has sensors that measure temperature and conductance at the skin which makes it difficult for a monitored person to remove or tamper with the device without being detected (Lettingwell *et al*., 2013). It can be used when showering but cannot be immersed in water (Lettingwell *et al*., 2013)

Data are transferred from the anklet to a centralized AMS server where computer algorithms identify potential alcohol consumption and tamper violations which are then reviewed by AMS staff. Reports of confirmable violations are sent to those with direct responsibility for monitoring offenders. Initially data were transferred from the anklet to AMS via a modem or via a computer during daily office visits but more recent versions of SCRAM have incorporated a wireless capability that obviates the

need for a landline with upload options including base station, wireless base station, DirectConnect and Ethernet.

The other main brand of continuous monitor to be developed was the Giner WrisTAS (Wrist Transdermal Alcohol Monitoring) (Giner, n.d.) which provides continuous samples. It is worn on the wrist and does not have a wristlock so can be removed before showering or bathing, however this reduces its usefulness as a means of providing a continuous objective measure of compliance with abstinence requirements (Lettingwell *et al*., 2013). WrisTAS is not available commercially and was superseded by the Transdermal Alcohol Detection (TAD) device from BI Incorporated (see http://bi.com/tad/). The latest version of SCRAM and the TAD are available with radio frequency (RF) technology so can simultaneously be used to monitor curfews (Marques, 2011; McKnight *et al*., 2012). Both contain tamper detection features and are water resistant although they cannot be submerged in water and may be uncomfortable to wear.

A number of studies have been conducted to explore the validity, accuracy and reliability of TAM technology. For instance, Marques and McKnight (2007) compared the accuracy of the SCRAM and WrisTAS on 22 individuals who participated in laboratory drinking and drinking on their own. They found that the SCRAM detected more drinking episodes than WrisTAS, although both devices had problems with false negatives and unreadable data, especially for lower concentrations of alcohol (Lettingwell *et al*., 2013). They also found evidence that water accumulation could result in a reduction in the accuracy of SCRAM over time but that improvements in accuracy were likely to be achieved with ongoing development of the technology.

There is evidence that transdermal indicators of alcohol consumption may, as a result of differences in skin quality, provide inaccurate predictions of blood alcohol content (BAC) (Barnett *et al*., 2011). Marques and McKnight (2007), for example, found that transdermal readings for women were lower relative to BAC than were those of men possibly as a result of gender differences in the outer epidermis and level of hydration. While TAM can detect the presence or absence of alcohol consumption, transdermal alcohol concentration is closely related but not identical to BAC, leading researchers to conclude that TAM devices should be considered as a dichotomous measure of whether or not alcohol has been consumed rather than as an accurate estimate of BAC (Barnett *et al*., 2011).

In a similar vein, Marques and McKnight (2007: 3) concluded from their comparison of SCRAM and WrisTAS that both devices 'performed more poorly than we expected with respect to sensitivity and accuracy' but that the 'transdermal concept is valid as long as expectations of quantitative parity with BAC are moderated.' A similar conclusion was reached by Lettingwell *et al.* (2013: 19) who argued that TAM devices 'provide objective, continuous alcohol consumption data' and can be used to measure compliance with sobriety conditions because positive/negative readings are highly accurate, but that they are less well suited to providing accurate indications of the *level* of alcohol consumption. They do caution, however, that while preliminary data on TAM devices are 'promising…more research on the reliability and validity of the devices is also warranted.'

Weighing Up the Evidence: Summary of Key Points

There is some evidence to suggest that transdermal alcohol monitoring devices (TAMs) are accurate in detecting the presence or absence of alcohol, but that they are less well able to provide accurate indications of the amount of alcohol consumed.

5.4 The Effectiveness and Impact of Remote Alcohol Monitoring (RAM)

The effectiveness of RAM can be assessed in a number of ways. In the short-term, it is useful to consider the extent to which those being monitored comply with the conditions of their orders and in the longer term whether there is any impact upon alcohol consumption, recidivism and relevant health outcomes. Here, we focus first on compliance before considering what (little) is known about the effectiveness of RAM in relation to longer-term outcomes.

Compliance

Reports of compliance levels associated with RAM tend to suggest that the majority of persons monitored are either fully compliant or have only one or two violations, although studies where more than one method of RAM is used tend not to provide separate data for different modalities of monitoring. High rates of compliance have been attributed to the availability of swift and consistently applied sanctions such as short prison sentences which serve as a deterrent to continued alcohol use (The Policy Exchange, 2013).

In the UK context, interim data on the introduction of the Alcohol Abstinence Monitoring Requirement in London also indicated high levels of compliance, with a compliance rate of 94% over the first six months (Pepper and Dawson, 2015). A report by the Policy Exchange (2013) provided details of compliance levels across three sobriety schemes in the United States to inform the introduction the London scheme. The rate of completion reportedly varied between 68% and 84% with no recorded violations and between 99.3% and 99.7% monitored days sober. McKnight *et al.* (2012) report levels of compliance – no drinking or tapering with the equipment – across their six case studies ranging from 66% to 88%, with the majority of instances of non-compliance involving tampering rather than alcohol consumption while Long *et al.* (2010) reported that 75% of offenders who participated in the South Dakota 24/7 Sobriety Project were fully complaint and 96% were fully compliant or had no more than two violations. Slightly lower compliance levels were reported from a pilot of the use of SCRAM in Alaska, where 56% of 319 individuals monitored between 2003 and 2005 were found to have been fully compliant, with no confirmed alcohol consumption or equipment tampers (McKelvie, 2005).

There is some limited evidence that compliance rates may vary according to characteristics of the population being monitored, although these difference do not appear to be large. Fell and McKnight (2013) have undertaken initial analysis of a database consisting of 157,584 individuals made subject to SCRAM since 2009. The majority of the sample were male (79%) and between 21 and 54 years of age (87%), with men assigned, on average, to a longer period of monitoring than women (89 vs. 77 days). Overall, rates of alcohol consumption and equipment tampering were observed in 24% of cases, with slightly higher rates among men than women (25% compared with 24%) and among those aged between 35 and 54 years of age (27%).

Robertson and Marples (2008) have suggested, on the basis of their analysis of data from the use of SCRAM with juvenile referred via the juvenile court or drug court, that younger people subject to RAM may have a higher level of tamper alerts than adults although no directly comparable data are presented.

Impact on Alcohol Consumption, Recidivism and Health

As we shall see, however, there still is very limited data on the effectiveness of transdermal devices – especially in the criminal justice context – despite their increasingly widespread use (Fell and McKnight, 2013). Because it is the most widely used device, most of the research that is available has focused on SCRAM although McKnight *et al.* (2012) found that none of their case sites had studied the effect of TAM on recidivism and Barnett *et al*. (2011: 392) observed that, '[a]lthough the SCRAM is regularly worn by court-referred offenders, no published reports of its efficacy are available, nor is the SCRAM being evaluated as an intervention tool in a voluntary population.'

Kilmer *et al.* (2013) examined the public health impact of South Dakota's 24/7 Sobriety Project in which those convicted of alcohol related offences had to submit to twice daily breathalysing or wear a continuous RAM anklet (worn by approximately 15% of participants) by comparing arrest levels and vehicle crashes in counties that that operated the programme and those that did not. Between 2005 and 2010, a period during which approximately 17,000 individuals had participated in the 24/7 Sobriety programme, there was a 12% reduction in repeat driving under the influence (DUI) arrests and 9% reduction in domestic violence arrests although no clear evidence of a reduction in car crashes. Because the analysis was based on county level data (rather than on a follow-up of participants who had been subject to different types of monitoring) it is unclear to what extent the observed reduction in arrests was attributable to participation in the programme nor whether the use of RAM more specifically had resulted in a reduction in alcohol-related recidivism.

Flango and Cheesman (2007) compared the outcomes for 114 offenders in North Carolina who wore the SCRAM device and 261 similar offenders who did not. Overall there was no significant difference in recidivism rates between the two groups. However when only those with at least two prior offences were considered, the

SCRAM wearers had a significantly lower rate of reconviction for any crime in the short term (15.7% compared with 28.6%) although in the longer term (after around 3.5 years) the rate of recidivism was higher among the SCRAM sample.

Flango and Cheesman's (2009) analysis of SCRAM as a condition of a court-ordered sentence in North Carolina suggested that re-arrests for DWI offences were lower among DWI offenders with at least one prior conviction for this type of offence who were monitored using SCRAM for at least 90 days. However, limitations to the research methodology were acknowledged, including the fact that the study was conducted in a single location using a retrospective matched sample design and it was not possible to disentangle the effects of RAM from alcohol treatment. Flango and Cheesman conclude, however, that while these results must be considered preliminary, the very low level of re-arrests (3-5 per cent) while offenders were wearing the anklet suggests that it may be useful as a deterrent and monitoring tool.

Wiliszowski *et al*. (2010) conducted an analysis of three intensive supervision programmes for DWI offenders which contained varying components and requirements. They found that each of the programmes resulted in at least short term reductions in recidivism. Although Wiliszowski *et al*. (2010: 8) concluded that the monitoring of alcohol consumption 'appears to be a key component of the programs and has the potential to be very effective in reducing offender recidivism', they also acknowledged that it was not possible to identify the separate effect of monitoring and that 'these devices and alcohol monitoring in general need to be evaluated for their effectiveness and feasibility' (2010: 9). There is even less data available on the effectiveness of RAM for different types of alcohol-related offences and whether effectiveness varies according to the point in the criminal justice process at which it is used and the length of monitoring period involved (The Policy Exchange, 2013).

While there is some limited evidence that RAM may have a short-term effect on alcohol-related offending, it is also argued that RAM needs to be integrated within a broader treatment and support package to achieve long-term changes in alcohol consumption and associated behaviour (The Policy Exchange, 2013). As Flango and Cheesman (2007: 105) have observed, 'there is little in the literature about alcohol-monitoring devices, or electronic devices in general, to suggest that monitoring in and of itself will have a long-term influence on offender behaviour.' This, indeed, is

acknowledged by the manufacturers of SCRAM who have indicated that the device was designed to work as part of an integrated programme package 'including initial offender assessment and ongoing client evaluation, substance abuse treatment, house arrest, definitive consequences for violations, and graduated sanctions' (Phillips, 2000: 44).

Weighing Up the Evidence: Summary of Key Points

- Several studies suggest that levels of compliance with RAM are generally high, and that violations more often take the form of equipment tampers than drinking events.
- There is limited evidence that RAM may have a modest impact on alcohol-related offending in the short term, but longer-term benefits require it to be integrated with relevant treatment and support.

5.5 Legal Issues and Ethical Implications of Remote Alcohol Monitoring

Opposition to the concept of RAM has included scepticism about the likely impact on alcohol consumption without associated treatment, a questioning of the emphasis upon abstinence when in the UK this is less commonly the focus of treatment programmes, and a concern that a focus on alcohol could divert attention from issues of power and control as underlying causes of domestic abuse (Humphreys, 2013). There is usually a requirement that monitored persons make a financial contribution to cover the costs of their equipment in the United States, however in England and Wales a requirement of this type, while initially contained in proposed legislation for the introduction of alcohol monitoring, did not receive political support and was removed (Humphreys, 2013).

In the Scottish Government (2013a) consultation on the potential use of RAM in Scotland, some concerns were raised about the ethical implications of this form of technology, particularly if introduced on a compulsory, as proposed to voluntary,

basis. While particular concerns might arise in relation to the human rights of offenders, proponents have argued that, particularly if a 'course of conduct' (or established pattern of alcohol-related offending) can be established, legal challenges on this basis are unlikely to be successful, and that RAM should be considered as an aid to treatment that may serve as a deterrent to further offending rather than as a punishment (Shaw *et al.*, 2012). The failure of the voluntary HMP Barlinnie experiment with ex-prisoners who participated on a voluntary basis may suggest that RAM might be more successful in Scotland if introduced on a compulsory basis. However, the problems that arose with the HMP Barlinnie pilot arguably derived less from its voluntary nature than from the fact that there were no sanctions available in the event of non-compliance (see Nellis, 2014a). The next sub-section shifts the focus to the costs involved in the use of RAM, GPS and RF EM in different jurisdictions in the United States and Europe.

5.6 Costs

Internationally, a significant number of policymakers and researchers draw attention to actual or potential fiscal savings in the use and impact of different electronic monitoring technologies, in that all of them are usually significantly cheaper than incarceration. For example, Yeh (2010, 2015) puts forward the proposal that shifting parolees and probationers to electronically monitored home detention would result in staggering benefits if implemented across the United States, estimating the social value and annual predicted cost reductions in crime associated with EM in the hundreds of billions ($USD). There are inherent complexities in drawing legitimate inferences about international policy transfer and the expansion or alteration of the uses of EM in Scotland. While economic analysts such as Yeh (2010, 2015) offer interesting hypothetical visions of shifting large amounts of people from other penal sanctions to EM, the relevance of their cost-benefit claims are muted by the reality that the American penal landscape and associated fiscal burden, at a nationwide level, lacks comparative generalisability to other nations.

Cost savings are contingent upon many factors and, in light of this, detailed economic modelling and predictions of benefits for Scotland based on comparisons with other jurisdictional approaches (and respective currencies and economies) is

beyond the scope of this Review. What this Review does include is mention of cost-benefits associated with certain approaches in their respective jurisdictional contexts, where we cite the analyses of others. Any fine-grain fiscal details (e.g., current cost per person per day, savings from executing prison sentences under EM in the community) cited in this Review need to be understood as dynamic and changing. Numerous factors affect how cost estimates should be understood. For example, estimates from other currencies (€Euro, $USD) shift in the meaning of their value over time (e.g., a certain € sum in 2008 is different to the worth of that sum now, in the same currency), and in relative comparison to the value of the British Pound. There are also notable shifting economies of scale. The first few years of implementing new electronic monitoring technologies and modalities are likely to be associated with moderately high start-up costs, with less fiscal 'return on investment' relative to the amount being spent.

A final caveat underpinning discussions of cost benefits is cogently highlighted by Nellis (2015) in the Council of Europe *Standards and Ethics of Electronic Monitoring* report. He states that 'ethically, cost alone should never be a reason for introducing EM … simply because it is cheaper than prison (which it demonstrably is) – there have to be sound penological reasons for using it, and with deep thought given as to how it can be used wisely and well' (Nellis, 2015: 11-12).

As stated earlier in this Review, in 2013, the average cost per EM order per day in Scotland, using RF technology, was estimated at £10.17 (€14.29) (Scottish Government, 2013a: 7). The following sub-sections provide estimated costs in other jurisdictions for RF, GPS and other technologies. Summarised research findings from Washington D.C. are included here as illustrative of the *types* of measures worthy of consideration in estimates of costs, savings and benefits of EM as a penal sanction, in combination with other measures such as probation supervision.

Electronic Monitoring in Washington, D.C.: Costs and Benefits of Probation with EM in Comparison to Probation without EM

Roman, Liberman, Taxy and Downey (2012) conducted an in-depth review of multiple forms of evaluation research and fiscal analyses to develop a meta-analysis, estimating the costs and benefits of 'probation augmented with electronic

monitoring' in comparison to 'standard probation' involving community supervision without electronic monitoring in Washington, D.C. Their district-specific EM programme modelling is based on anticipated participation of approximately 800 probationers. Furthermore, their modelling is based on the use of GPS electronic monitoring technology, and considers both equipment costs and monitoring costs.

Roman and colleagues' (2012: 3) estimated costs, savings and benefits are summarised here:

- *Costs of programme operation:* it is estimated that a GPS-based EM programme with probationers costs approximately $750 USD (£476) per participant per year, and ranges between $460 USD (£292) and $1,070 (£679);
- *Estimated impact of probation with EM on re-arrest:* on average, probation with EM would reduce re-arrests by an average of 23.5% (down to 184 re-arrests out of 800 for probationers with EM, compared to 240 re-arrests out of 800 for standard probation supervision);
- *Agency savings:* it is estimated that there is an 84% probability that probation with EM will yield any agency savings. On average, it is estimated that probation with EM reduces per participant costs to local agencies by $580 (£368) and saves federal agencies $920 (£584);
- *Societal savings from averted crime victimisation:* it is estimated that there is an 84% probability that probation with EM programmes (with 800 participants) would produce societal benefits from averted victimisation. The benefits of prevented victimisation associated with EM programme participation are estimated to be an average of $3,800 (£2,413) per participant.

Source: Roman *et al*. (2012: 3); £BPS added by the authors in June 2015.

One of the limitations of this modelling and analysis by Roman and colleagues (2012) is that it does not include enough information about *how* and *why* probation with EM is seen to be more cost efficient and more effective than standard probation in Washington, D.C. This is not to call into question their empirical methodology in consolidating their findings, as they account for this and it appears robust; however,

more transparent and detailed descriptions of the anticipated successful EM programme that is the focus of their analysis would enable others to better assess the potential generalisability of these findings in relation to other contexts and jurisdictions. The EM programme impact is predicted based on hypothetical projections, while informed by prior research and, as such, these estimations are not actual results from a real programme that is currently in operation.

Electronic Monitoring in Europe: Technologies, Modalities and Costs

Table 5.1 presents an overview of the technologies, modalities and costs of electronic monitoring in selected European countries (see Nellis, 2013 for a more detailed list). International analysts highlight Sweden as being an exemplar of best practice in electronic monitoring. The data presented in the Table also demonstrates that Sweden has one of the lowest 'daily costs' of EM in Europe. In 2012-2013, that is the time that the data for the table below was collected in a Confederation of European Probation (CEP) survey (Nellis, 2013a), Sweden were primarily using RF monitoring, with the use of GPS restricted to trials (Wennerberg, 2013), and this is relevant to consideration of costs. That notwithstanding, the 'daily cost' information in the Table needs to be interpreted with caution as the figures may or may not include different factors and resources, with different ways of counting between jurisdictions in a self-report survey.

Table 5.1: *Electronic Monitoring in Selected European Countries: Types, Costs, and Numbers*

Country and Type of Scheme	Type of EM Technology	Service Delivery By	Daily Cost (components)	Daily Numbers (on 31.12.2012)
Belgium Execution of a prison sentence; early release	Voice verification for under 8 months; RF for 8 months – 3 years	Prison Service, with equipment provided by a private company	€29 (£17.80) Cost of equipment, and probation and monitoring staff.	924 on execution of a prison sentence; 371 on early release
Denmark Execution of a prison sentence	Mobile phone frequency tagging	Probation Service, with equipment provided by a private company	€56 (£40) Cost of equipment, and supervision programmes	317 on execution of a prison sentence
Netherlands Pre-trial condition of a court order; Execution of a prison sentence; Early release	RF and GPS for pre-trial condition of a court order and early release; RF only for execution of a prison sentence	Probation agencies, with equipment provided by private companies	€75 (£53.50) for RF and GPS €45 (£32) for RF only	94 on pre-trial bail; 23 on condition of a court order; 132 on early release
Norway Execution of a prison sentence; Early release	RF and GPS	Probation Service, with equipment provided by a private company	€100 (£71.30) for each scheme. Costs of equipment, installation, monitoring, travel	109 on execution of a prison sentence; 33 on early release
Portugal Pre-trial bail; Execution of a prison sentence; Post-release; and Domestic violence tracking scheme.	RF and GPS	Probation Service and a private company	€14.2 (£10.13) for each scheme, except €21.2 (£15.12) for GPS domestic violence scheme. Cost includes staff, equipment, install., operations	495 on pre-trial bail; 100 on execution of a prison sentence; 15 on post-release; 105 on GPS domestic violence scheme
Spain Early release	RF, GPS and Voice verification	Prison Service, with equipment and installation by private companies	€5.5 (£3.92) Costs include savings on prison, equipment, and monitoring	1746 on early release
Sweden Execution of a prison sentence; early release	RF and GPS	Probation Service, with equipment provided by a private company	€3.5 (£2.50) Costs include equipment, installation, monitoring	386 on execution of a prison sentence; No figure given for early release

Source: Table compiled from data from Nellis (2013a: 2-5); £BPS equivalence added by the authors in June 2015.

Costs of Remote Alcohol Monitoring

The costs of RAM in the United States are usually met by monitored persons who are required to pay for their devices and/or monitoring. McKnight *et al.* (2012) report the costs of transdermal alcohol monitoring (TAM) as being $5-12 USD (£3.18 – £7.62) per day, which represents a higher daily unit cost than that associated with other technological devices such as interlock devices (which were estimated to cost between $2.25 (£1.43) and $2.75 USD per day). As such, the daily costs of TAM are around five times higher than those of interlock devices (Marques, 2011).

The Virginia Department of Corrections (2013) has estimated that there is a one-off installation cost of $50 – 100 USD (£32 - £64) and a daily cost for SCRAM of $7-12 (£4.45 - £7.62) and for the BI TAD of $7-10 (£4.45 - £6.35). Similar figures have been provided for the use of SCRAM in North Carolina where installation was estimated to cost $75 (£48), with a per diem monitoring cost of $12 (£7.65) (Rehabilitation Support Services, 2010). Shaw *et al.* (2012) estimated that the use of SCRAM in Scotland would cost less than £1800 for the monitoring and enforcement of a 6 month sobriety condition. Based on the US figures, it is estimated that a six-month period of RAM would cost approximately £1440 and three months of monitoring would cost around £740 on top of the additional costs of treatment and support. The cost of a one-year custodial sentence in Scotland has been estimated at £37, 059 (Scottish Government, 2015).

None of the case study sites examined by McKnight *et al.* (2012) had conducted an analysis of the cost effectiveness of TAM but they believed that it produced cost saving as a result of reduced imprisonment costs where offenders were monitored as an alternative to incarceration, reduced staff time arising from the automated reporting of violations and the requirement that offenders met much of the cost.

6. Conclusion

The international uses of electronic monitoring has increased over the 30 years or so since it was first introduced in the United States to monitor the adherence of offenders to house arrest or curfews (Ball *et al*., 1988). The use of EM has diversified in terms of its geographical spread and in relation to the types of offences and groups of people made subject to it at different points in the criminal justice process (Nellis *et al*., 2013). The objectives of EM are also diverse and include diversion from custody and reducing prison populations, supporting desistance, providing public protection and reducing criminal justice costs. Developments in technology bring with them new opportunities to make use of EM with new groups of people and in new ways. However this, in itself, presents not insignificant practical and ethical challenges. As the then Cabinet Secretary for Justice observed in the Ministerial foreword to the Scottish Government consultation on electronic monitoring:

> The extent to which electronic monitoring can continue to provide a benefit will depend less on the technology available now and in the future, than on how we might choose to apply it: with which groups, with what safeguards and to what end (Scottish Government, 2012).

To this end, the purpose of this Review has been to: (a) describe the current purpose and use of electronic monitoring in Scotland, how it works in practice and highlight changes that could improve the current system; (b) to consider the types of behaviour other jurisdictions have sought to address using electronic monitoring and assess how effective this is, and (c) offer comparative insights into the uses of different electronic monitoring technologies.

6.1 Weighing Up International Evidence and Experience: Summary of Key Points

In conclusion, we wish to underscore key points which emerge from the Scottish and international literature and experiences incorporated in this Review:

i. **The effectiveness of electronically monitored punishment must be understood as contingent and complex.** Gainey (2014: 345) summarises a fundamentally important argument consistently made by others (see HM Inspectors of Probation, 2012; DeMichele, 2014; Payne, 2014) in the international literature: 'Electronic monitoring is just a tool and that like any other tool, it can be effectively used for the appropriate purposes and of course ineffectively used where it should never had been applied in the first place.' Gainey (2014) rightly warns against the extremes of simplistically constructing electronically monitored punishment as a panacea or as an abject failure in response to the problem of crime. In this context, the growing use of GPS-based EM for the indeterminate monitoring of sex offenders in some jurisdictions has raised a number of associated practical and ethical concerns, and research shows that it has not produced increased efficacy and efficiency.

ii. **EM is more effective when integrated with the use of other supervision and supports.** There is moderately strong consensus in the international empirical literature that electronic monitoring should be used in tandem with more rehabilitation-focused supervision and reintegrative support options (formal or informal) in order to effectively maximise opportunities for compliance and desistance from crime. The only clear exception to this would be monitored people who have been assessed as presenting a low risk, where assessment shows that there is not a clear justification or purpose for concurrent intervention. Arguments for some level of integration of EM with supervision or supports tap into issues of efficacy and ethics. Without complementary supervision and support, the impact of EM as a stand-alone measure may be limited to its duration, only realising modest benefits in some cases in the short-term (e.g., time delays in re-offending) once the period of EM ends. This is an important message in relation to the use of EM in Scotland where the majority of monitored persons do not receive additional social work supervision, nor is there a normative process of making referrals to other types of services and community-based supports. This notwithstanding, more research is needed to better understand, from the perspectives and experiences of monitored people, the nuances of *how* and *why* EM might be a factor (compared to other factors, like professional supervision or positive social supports) in effectively

encouraging or motivating them to comply and to desist from crime, and the conditions and resources needed to facilitate this.

iii. **Current and future uses of EM in Scotland should be guided by the European frameworks and recommendations on electronic monitoring.** A significant number of the issues and concerns raised in the international literature and experience about EM can be addressed or prevented by adhering to the European guidance, which offers a sound practical and ethical foundation upon which to build future developments (see Nellis, 2015). This guidance recognises that electronically monitored punishment involves restrictions of liberty and incursions on personal privacy and, as such, its use as a sentencing option or as a form of early release should be justified and in keeping with the purposes it seeks to achieve and fundamental principles (e.g., proportionality) which underpin notions of justice.

iv. **There is emerging evidence to support the increased use of 'away from' restrictions and/or bilateral EM as part of a multi-faceted approach to protect victims of violent crime and sexual crime.** Some jurisdictions are making increasing use of bilateral EM in cases of domestic abuse and stalking, although there are variations in how this is done. Its use with people accused of domestic abuse involving GPS technology is typically integrated within a wider range of restrictions on their liberty, including probation-like conditions and bans on communication with and proximity to the victim. To be clear, the EM technology itself, whether it is RF or GPS-based, cannot be said to directly protect victims by *preventing* crime – and this must be clearly established with victims and their advocates to ensure realistic expectations of participation in EM. However, if EM equipment is working as it should, it can offer advance notice to victims and authorities if a monitored person tries to enter exclusion zones or approach the victim(s). Furthermore, 'away from' restrictions can be used in tandem with tailored time curfews and restrictions to a place in cases where this is appropriate.

v. **Victim, public and media attitudes towards EM need to be understood in their cultural context.** Internationally, there remains a paucity of research about these issues. There is some evidence from Sweden that media attitudes towards EM

can be improved through effective media strategies, although there is a need for these to be culturally situated and similar media engagement approaches may not work in the same ways in other jurisdictions with a more hostile media and political climate.

vi. **Flexibility and graduated changes to EM orders can be used to motivate compliance.** Flexibility in the use of EM orders and conditions may foster motivation for monitored people to comply. The capacity to incentivise and reduce temporal and spatial restrictions (e.g., reduce the days of time curfews from 7 days a week down to 5 days a week) as a form of recognition and reward for a monitored person's formal compliance (e.g., not accruing violations) during the initial stages of their order may positively affect their motivation levels, perceptions of the legitimacy of the order and 'may foster reintegration back into society' (Nellis, 2013b: 204). This flexible and responsive approach is advocated as 'helpful' in the Council of Europe ethical standards (see Nellis, 2015: 13). Other penal sanctions (e.g., prison or probation/community payback) routinely involve a lessening of restrictions or levels of supervision and the potential of earned privileges, if a person's risk classification is reduced and they demonstrate compliance and pro-social behaviour; there is merit in exploring the impact of graduated reductions in monitoring. More research is needed to compare the perspectives and compliance (e.g., numbers of violations, order completions) of monitored people whose orders are adjusted by authorities in response to their compliance, compared to those with the same curfew times and days for the duration of their order.

vii. **One size does not fit all: tailor the use of EM in response to the diversity and vulnerability of monitored people.** The potential positive impact of EM and generalised claims of effectiveness are significantly diminished in cases where it is used without due regard for diversity and vulnerability. Specific practice considerations or challenges may be encountered when EM is used with women (especially where they are a primary caregiver), with people from minority ethnic groups and speakers of other languages, and with people with cognitive impairment, mental illness and learning disabilities. Within the current operation of EM in Scotland, to give an example of responsivity, there are tailored provisions for the electronic monitoring of people who are deaf or hearing

impaired. They are subject to the same processes and standards as other monitored people in terms of things like breach criteria; however, the *way* in which they communicate with the monitoring services provider (G4S) is tailored to enable their participation. However, the need for tailoring in response to diversity also points to a more general issue regarding creativity in the use of EM, with there being scope for a less standardised usage – through, for example, the more creative and individualised use of curfew times – to better support monitored people and facilitate their compliance, rehabilitation and desistance from crime.

The final sub-sections draw conclusions about the two new technologies that have formed the basis of discussions in Section 5.

6.2 Conclusions about GPS Tagging and Tracking

A number of conclusions can be reached, based on the international evidence and experience of GPS EM featured in this Review. However, the following conclusions are offered with full acknowledgement of the limited availability of robust and longitudinal empirical data, as well as mixed findings and results about impact and effectiveness across different jurisdictions.

i. **GPS may complement RF, but there is not a clear case for GPS to totally replace RF for use with all monitored people in Scotland:** In light of the evidence and experience presented in this Review, our position and conclusion is that GPS should not entirely replace RF monitoring in Scotland. This reflects the Council of Europe discussion of the principle of proportionality (Nellis, 2015), as well as the fact that few, if any, European jurisdictions have completely superseded the use of RF with GPS. It also incorporates the above discussions of cost, with international experience suggesting that GPS is more expensive in terms of direct costs, as well as the costs of responding to increased data, including alerts and violations. As has been established, GPS tags can also detect RF signals, meaning that one device can use both systems, and tagged offenders can be given 'away from' restrictions in combination with curfews and restrictions to a place for a time. In light of this, if GPS is introduced and deemed to be necessary in the surveillance of certain offenders or offence types, arguably there is no

demonstrable need to abolish the concurrent use of RF in Scotland, as it is already in use and working effectively for the purposes it is intended to monitor others who do not require location-based continuous surveillance.

ii. **There is some modest empirical support for the use of GPS monitoring as a component of surveillance and risk management with certain types of offenders.** GPS monitoring with particular types of offences and offenders may be justified where it will offer real-time knowledge and bolster the capacity for authorities to act to protect victims and the public. Although the numbers of electronically monitored people managed through MAPPA currently remain small, GPS EM may be used as one feature of an integrated package of risk management and support. The overarching empirical evidence about potential positive impact needs to be weighed up in light of the potential legal issues and ethical implications involved in introducing GPS, especially active GPS, in Scotland. However, it is our view as authors that there is not enough convincing evidence that GPS should be used with children which, in Scotland, would mean the small numbers of children with Movement Restriction Conditions made as a component of an ISMS order, managed through the Children's Hearings System.

iii. **If GPS is introduced as a technology used in electronically monitored punishment in Scotland, it needs a legislative or statutory basis.** Given the emphasis on potential uses of GPS monitoring with sex offenders and domestic abuse offenders, enabling them to 'opt out' of a GPS tag whenever they feel like it, without sanction for non-compliance, raises numerous ethical concerns. Their consent should still be sought, as is currently the case with RF EM in Scotland, however, if the purpose of EM in Scotland with adults is to continue to function as an alternative to custody, then GPS EM with adults necessarily needs to be imposed by authorising agencies. Experiences of optional and entirely voluntary GPS monitoring of people with prolific offence histories in England and Wales show that there are moderately high attrition rates where people decide to stop participating (see Nellis, 2014b). It is vital to note that any amendments to existing legislation, or any new legislation, to enable the introduction of GPS monitoring fits with other legislation and conventions on privacy, data protection and human rights.

iv. **Integration of GPS monitoring with supervision and support options is linked with improved effectiveness.** This echoes the earlier conclusions stating more generally that the most effective and ethical international approaches involve some level of integrated service provision or close inter-agency work to not only monitor offenders, but offer supervision and support as well. We feel this argument is particularly salient if GPS is introduced and used with offenders on the grounds of risk. If a domestic abuse or sex offender is deemed to need location-based monitoring, it can be argued that engagement with helping professionals such as criminal justice social workers and referral to other treatment and support options is essential to help them address the criminogenic risks and needs associated with their offending. A GPS tag may have some impact during the duration of the order or licence; however, it seems unrealistic to expect this alone to be a catalyst for rehabilitation and secondary desistance.

v. **Limitations of GPS technology and monitored people's rights:** In-depth consideration needs to be given to the limitations of GPS technology, and the documented international experience that it may routinely generate alerts with regard to monitored people's rights. We believe this is particularly salient with regard to prisoners and parolees. In the current operation of EM in Scotland, while the discretion for revocation of a HDC licence remains that of the authorising agency (for example, the HDC Coordinator for a Scottish Prison Service facility), any violations are likely to prompt revocation and recall of prisoners to custody (Scottish Government, 2013a). Recall has serious implications for their prospects of release. The appeal process to challenge a HDC revocation and recall is handled through the Parole Board; as with any detailed process of review, it may take time. If GPS technology is introduced, retaining the current strict breach criteria for prisoners on HDC and parolees may affect rates of revocation and recall. Given that some of the limitations of the technology are issues beyond the control of the individual, consideration needs to be given to the rights of monitored prisoners and parolees, including avenues for appeal, to verify and differentiate compliance or non-compliance with the conditions of their licence, and compare circumstances such as loss of signal to behaviours that are demonstrably intentional in breaching the conditions of their licence. For example, returning a person to custody because of a violation (loss of signal)

incurred during a train journey is not ethically defensible, and may affect perceptions of the credibility and procedural justice of EM.

vi. **Workload, time and resource implications:** The introduction of GPS EM will entail considerable use of resources, and is likely to produce increases in the workload and statutory responsibilities of some stakeholders (Armstrong and Freeman, 2011; DeMichele and Payne, 2007; Geoghegan, 2012; Payne and DeMichele, 2010).

vii. **Awareness-raising about what GPS monitoring can and cannot do would be beneficial in encouraging realistic expectations:** The literature in the United States and the UK warn of myths and unrealistic misconceptions among the media, the public and some practitioners and stakeholder agencies. Marketing EM as a wonderful new 'crime fighting tool' may belie the reality that a GPS tag alone cannot physically stop, nor directly prove, the commission of a crime. The capacity for tags to be removed, or signals to be jammed, needs to be acknowledged. In terms of excellent practice, it seems that the approach taken in Sweden and Norway of awareness-raising and positive proactive engagement with the media and the public about what EM as a penal measure involves may be beneficial, rather than leaving revelations of limitations to feature in critical headlines following an incident or serious case review.

6.3 Conclusions about Remote Alcohol Monitoring

As a mechanism for monitoring alcohol consumption, transdermal alcohol monitoring (TAM) has several advantages over remote breathalysing because it is less prone to cheating, provides continuous , round the clock monitoring and, by being portable, can provide samples regardless of where the monitored person is. McKnight *et al*. (2012) have identified the costs of the service and the need to educate stakeholders about its operation and potential as the main disadvantages of TAM. However they also cite a number of advantages including its effectiveness in deterring alcohol consumption during the period of monitoring enabling monitored persons to proceed to a recovery stage; the accuracy of the information collected; the increased likelihood of detecting instances of non-compliance; the timely provision of information about non-compliance to supervising officers; the ease of

installation and use of the equipment; its greater effectiveness than other techniques and available technologies in monitoring use of alcohol; and the fact that monitored persons may avoid a prison sentence and/or the need for frequent visits to provide regular breath tests.

On the basis of the material reviewed it is possible to reach a number of conclusions (some more tentative than others):

i. Studies consistently report high levels of compliance with the conditions of TAM during the period of monitoring.

ii. There is the potential for RAM to be used at different points in the criminal justice process – for example as a diversion from prosecution, as a condition of bail, as a condition of a community sentence and as a condition of early release from prison.

iii. There is also the potential for different types of alcohol related offences although its relative effectiveness with different target groups is not known.

iv. There is some indication of an impact on alcohol-related offending although the evidence is very limited and it has been suggested that a monitoring period of at least three months is required for reductions in alcohol-related offending to be achieved.

v. It would appear that while RAM in itself may not have an effect on long-term behaviour, it may be useful in providing additional motivation for those convicted of alcohol related crime to abstain from the use of alcohol while seeking treatment for alcohol problems.

There may, therefore, be some scope for the use of RAM on a statutory basis, subject to the monitored person's consent, with the availability of clear and appropriate sanctions for non-compliance. The experience at HMP Barlinnie suggests that it may be of limited use as a voluntary measure without the availability of graduated sanctions in the event that the monitored person fails to comply by consuming alcohol or tampering with device. However, although there is reasonable empirical support for the accuracy of the information provided by TAMs and levels of compliance have been reported to be high, it is important to recognise that similarly high levels of compliance may not be achieved with a different population of

offenders. Much of the research on RAM in the USA, for example, has focused on those convicted of drink driving offences whereas in Scotland there is a greater concern about levels of alcohol-related violence. If RAM is introduced in Scotland, therefore, it would seem prudent for this to be done initially in the context of a pilot that is carefully evaluated to establish the feasibility and effectiveness of RAM in the Scottish context.

Against a wider backdrop of the ongoing evolution and applications of electronic monitoring internationally, it seems appropriate to conclude with observations by Nellis and Vanhaelemeesch (2012: 1), reminding us that:

> Not all uses of EM have been wise... So, in thinking about a "gold standard" for EM in all its aspects we should remember that it is not EM in itself that we are judging, but the contribution that EM could and should make to civilised and constructive criminal justice systems, which make only sparing use of imprisonment and which are as firmly committed to the rehabilitation and reintegration of offenders as they are to public protection.

Each of these penal aims, and achieving the right balance between them, remain important considerations in the operation, and potential expansion, of EM in Scotland.

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