

• **Mountain Plains Evaluation, LLC** •

Analysis of 24/7 Sobriety Program SCRAM Participant DUI Offense Recidivism

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1 BACKGROUND

This analysis examines and describes individuals and outcomes for DUI offenders placed on Secure Continuous Remote Monitor (SCRAM) system as part of the South Dakota 24/7 Sobriety Program. The South Dakota 24/7 Sobriety Program started as a pilot project in January 2005. In 2007 the South Dakota Legislature authorized the creation of a statewide 24/7 Sobriety Program. The program requires DUI offenders to demonstrate sobriety through monitored sobriety testing. This program developed in direct response to the overwhelming need to address repeat impaired driving offenders in South Dakota. Due to the long distances that offenders had to travel for in person breath testing, in 2005 the program began integrating SCRAM technology as a pilot project in a number of South Dakota counties. Since then, SCRAM device usage has expanded throughout South Dakota and is being used by a wide array of offenders.

The 24/7 Sobriety Program is administered state-wide by the South Dakota Attorney General's Office. Alcohol Monitoring Systems (AMS) monitors data collected by SCRAM devices and generally provides daily electronic action reports to participating Sheriff Offices when there is a verified positive BAC reading or a tamper indication. Delayed reporting may occur on weekends and holidays. The Court may sanction an offender for those violations.

2 LITERATURE REVIEW

Impaired driving is a serious problem in the United States. In 2010, 1.41 million arrests occurred for driving under the influence of alcohol offenses (FBI, 2011). Statistics from the National Highway Traffic Safety Administration (NHTSA, 2012) shows 32,885 traffic fatalities in 2010. In that same year, South Dakota experienced 140 fatal traffic crashes with 46 (33%) of the crashes involving drivers with BAC of .01 or higher (NHTSA, 2012). Between 2010 and 2012 there were approximately 8,800 annual driving under the influence (DUI) arrests in South Dakota (SD Unified Judicial System, 2013). Approximately 30 percent of DUI arrests each year involve repeat offenders (Simpson, Mayhew, & Beirness, 1996). Repeat offenders are over represented in fatal traffic crashes (Fell, 1995).

Each year about 1% of all licensed drivers are arrested for a DUI offense and approximately 1/3 of all DUI arrests are repeat offenders (Fell, 1995). Attempts to reduce DUI recidivism are typically pursued through broad methods including the passage and enforcement of laws remediating offenders and through a combination of sanctions, education, and treatment (Hedlund, 1995). Traditional sentencing sanctions available to the judiciary have not been particularly successful with DUI first offenders and are even less successful with repeat DUI offenders (Wallace, 2008).

The South Dakota 24/7 Sobriety Program developed in direct response to the need to address repeat impaired driving offenses in South Dakota (Loudenburg, Drube, & Leonardson. 2010, p 1). Initiated in January of 2005, this nontraditional pilot project required participants to demonstrate abstinence from alcohol by reporting to the local county sheriff's office twice a day and passing a portable breath test. Participants who could not demonstrate complete sobriety or did not show up for the test were immediately returned to jail (Long, 2009).

Some participants could not get to the testing site at the prescribed times due to odd work schedules or the distance to the testing site (40 to 50 miles or more to the testing site) In addition, some rural counties lacked sufficient personnel to do the testing twice a day (Long, 2009). Secure Continuous Remote Alcohol Monitoring (SCRAM) bracelets were issued to participants in counties lacking the personnel to support testing twice a day (Long, 2009). In 2007, the South Dakota legislature authorized and funded the South Dakota 24/7 Sobriety Project statewide which included the use of SCRAM bracelets. Today 61 of South Dakotas 66 counties participate in the program (South Dakota Office of the Attorney General, 2014). These counties cover over 90 percent of the state's population (Long, 2009). On September 16, 2009, the South Dakota Supreme Court determined that the methodology utilized in the SCRAM bracelet met the evidentiary standard for the admissibility of scientific evidence (State v. Lemler 774 N.W. 2d 272, 2009 SD 86). Currently, more than 400 SCRAM bracelets are in daily use in South Dakota.

The Secure Continuous Remote Monitor (SCRAM) system from Alcohol Monitoring Systems of Littleton, Colorado is an ankle bracelet that measures alcohol consumption 24 hours a day, 7 days week by measuring alcohol excreted through the skin in the form of constant unnoticeable perspiration (Robertson, Vanlaar, & Simpson, 2006). About 1% of consumed alcohol is excreted through the skin (Swift, 2003). Individuals excrete consumed alcohol through the skin at different rates because of individual differences in the thickness, temperature, and hydration state of the external most layer of skin the stratum corneum (Anderson & Hiastala, 2006). In laboratory dose experiments, Transdermal Alcohol Concentrations (TAC) increase linearly as a function of the amount of alcohol consumed and correlate across participants with breath alcohol concentration and blood alcohol concentration but raw data is not an estimate of BrAC or BAC (Barnett, Tidey, Murphy, Swift, & Colby, 2011; Dougherty, Charles, Acheston, John, Furr, & Hill-Kapturczak, 2012; Marques & McKnight, 2009; Sakai, Mikulich-Gilbertson, Long, & Conway, 2006). The peak concentration of alcohol using TAC trail BAC and BrAC peak concentrations by 1.5 to 3.0 hours and have lower peaks (Anderson & Hiastala, 2006; Barnett, Tidey, Murphy, Swift, & Colby, 2011; Marques & McKnight, 2009; Sakai, Mikulich-Gilbertson, Long, & Conway, 2006). TAC correctly identifies alcohol consumption in 80 to 88 percent of drinking episodes in both laboratory and field studies (Barnett, Tidey, Murphy, Swift, & Colby, 2011; Marques & McKnight, 2009; Sakai, Mikulich-Gilbertson, Long, & Conway, 2006). False positives in laboratory studies have not been found (Marques & McKnight, 2009; Sakai, Mikulich-Gilbertson, Long, & Conway, 2006). False positive in field studies were not encountered (Barnett, Tidey, Murphy, Swift, & Colby, 2011; Marques & McKnight, 2009; (Sakai, Mikulich-Gilbertson, Long, & Crowley, 2006). Confounding blips from household chemicals and personal grooming items containing alcohol which might be interpreted as a "positive" can be identified by the magnitude, absorption speed and duration characteristics of the area under the TAC curve and ruled out as drinking episodes (Margues & McKnight, 2009). Based on monthly data from volunteers working in hair solons, auto shops, construction sites and other environments containing products which might be capable of producing positive results from other than alcohol consumption, AMS estimates the false positive rate is running at 0.12 percent (1 in 800) over 12 years of testing (Giles, 2009). About 15 to 24 percent of drinking episodes do not reach the current .02 cut off point and go undetected (Barnett, Tidey, Murphy, Swift, & Colby, 2011; Marques & McKnight, 2009). "The current validity and the level of accuracy of transdermal alcohol testing permit it to be used as a screening tool to verify compliance with orders of abstinence" according to Robertson, Vanlaar, & Simpson. (2006, p 9). Bock (2003) concluded that "the [Scram] product is able to detect circumvention of alcohol test

sampling, reliably ensures that test samples are from the intended test subjects, and detects drinking episodes around the clock regardless of subject’s schedule or location” (p. 4).

In 2009, Flango and Cheeseman published a retrospective study of SCRAM bracelet users and a matched comparison group who did not wear the SCRAM device. There were 114 SCRAM users and 261 in the matched comparison group. The average number of days SCRAM was worn by a participant was 70 days with a range of 8 to 212 days. Only 25 percent of the sample used SCRAM for 90 days or more. Of the 114 SCRAM users only four (3.5%) recidivated while wearing the bracelet and SCRAM did not reduce the probability of recidivism for offenders with no previous DUI offenses.

When the SCRAM device was worn by offenders with one or more prior DUIs for less than 90 days, the overall recidivism rate was the same for SCRAM users (21.7%) as the comparison group (21.2%). The pattern of recidivism varied over time for the two groups. At 364 days 33% of the SCRAM users had recidivated compared to 57% of the comparison group. At 648 days 30% of SCRAM user and 32% of the comparison group had recidivated while by 1000 days the trend had reversed.

When the SCRAM device was worn by offenders with one or more prior DUIs for 90 days or more, SCRAM user recidivism rate was 10.3% compared to 21.2% for the comparison group. The results did not vary over time (Flango & Cheeseman, 2009).

3 DESCRIPTION OF PARTICIPANTS AND DEMOGRAPHICS

The participants included in this analysis consist of 833 DUI offenders placed on SCRAM between December 2006 and September 2010 and had the SCRAM device removed as of 10/31/2010. As of 12/31/2012, the cutoff date for data collection for this analysis, a minimum of two years of post-SCRAM data had been collected for each participant.

Of the 833 study participants, 670 (80.4%) were male and 163 (19.6%) were female. The following table shows participant gender by DUI level.

Number and Percentage by DUI Level and Gender

DUI Level	Male			Female			All	
	N	Row %	Col %	N	Row %	Col %	N	Col %
1	114	76.0%	17.0%	36	24.0%	22.1%	150	18.0%
2	314	78.9%	46.9%	84	21.1%	51.5%	398	47.8%
3	197	84.9%	29.4%	35	15.1%	21.5%	232	27.9%
4	36	83.7%	5.4%	7	16.3%	4.3%	43	5.2%
5	9	90.0%	1.3%	1	10.0%	0.6%	10	1.2%
All	670	80.4%	-	163	19.6%	-	833	-

The mean age of all participants at SCRAM Off date was 36.3 years (stdev = 11.8 years). The mean age of male participants at SCRAM Off (36.6, stdev = 12.0) was slightly older than the mean age of female participants (35.0, stdev = 11.0). The following table summarizes each DUI level by age and gender.

Age at SCRAM OFF Date
mean (stdev, N)

DUI Level	Male	Female	All
1	36.0 (12.3, 114)	34.2 (12.7, 36)	35.5 (12.4, 150)
2	35.7 (12.2, 314)	33.4 (10.3, 84)	35.2 (11.9, 398)
3	37.9 (11.5, 197)	38.7 (10.9, 35)	38.1 (11.4, 232)
4	39.3 (11.3, 36)	38.4 (7.8, 7)	39.1 (10.8, 43)
5	38.4 (11.5, 9)	47.0 (NA, 1)	39.3 (11.2, 10)
All	36.6 (12.0, 670)	35.0 (11.0, 163)	36.3 (11.8, 833)

4 DESCRIPTION OF SCRAM PARTICIPATION

4.1 AVERAGE OF DAYS ON PROGRAM BY DUI

The mean number of days of SCRAM monitoring varied by DUI level with lower levels of DUI offenses having a lower number of days monitored on average. Thus, individuals with a DUI 1 offense in the sample were monitored for an average of 84.8 days and a median of 32 days. Individuals placed on SCRAM with a DUI 3 offense were monitored for an average of 217.4 days with a median of 186 days monitored.

SCRAM: Days Monitored

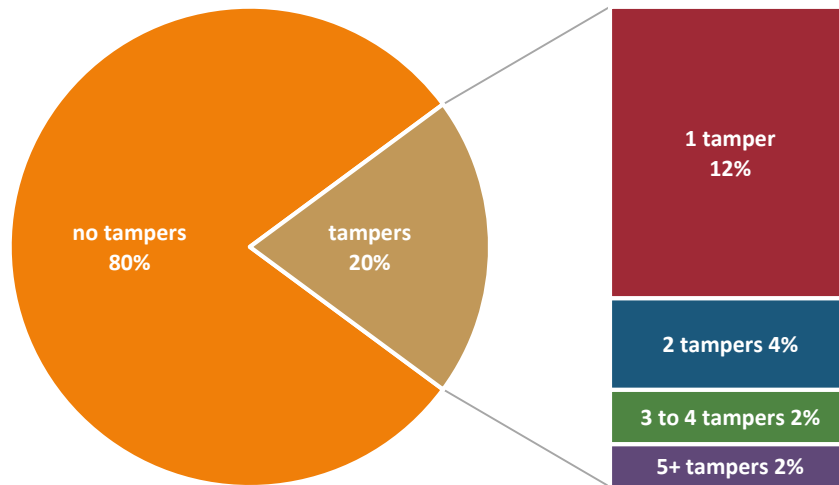
DUI Level	N	mean	stdev	Quartile 1	median	Quartile 3
1	150	84.8	112.8	30	32	82
2	398	175.5	121.6	76	157	254
3	232	217.4	157.0	91	186	325
4 or 5	53	201.0	185.4	82	148	261

4.2 DISCUSSION OF CONFIRMED POSITIVES, TAMPERS, COMBINED

The number of individuals having a confirmed positive test result (“positive”) while wearing the SCRAM was 46 (5.5%) of the 833 SCRAM wearers. An additional 167 individual (20.1%) had at least one tamper event (“tamper”) and 193 individuals (23.3%) had at least one tamper or positive while wearing

the SCRAM (twenty individual participants had both a tamper and positive while wearing the SCRAM device). It should be noted that 640 individual (76.8%) had neither a tamper nor a confirmed positive reported while being monitored. The tables and graphs below provide a summary of the confirmed positives and tampers of individual while wearing the SCRAM device.

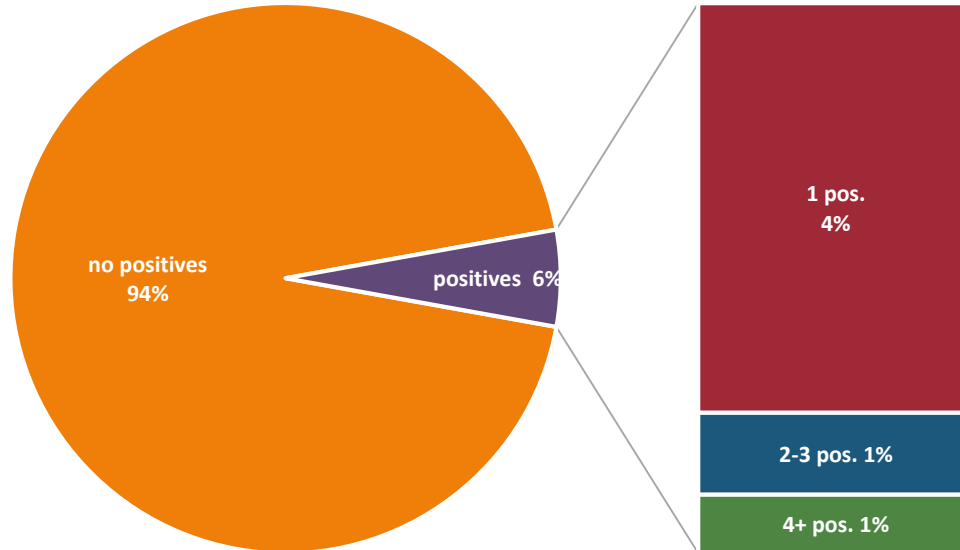
Tampers were recorded by 167 of 833 SCRAM users (20.1%) and had 338 tampering events.



Of those individuals with a confirmed tamper, 60% (101 of 167) of the individuals had only one tamper (2.0 events per participant with a confirmed tampering event).

N tampers	N	% of 167
1	101	60.4
2	32	19.2
3	12	7.2
4	7	4.2
5	5	3.0
6	4	2.4
8	3	1.8
10	1	0.6
11	1	0.6
12	1	0.6
total	167	100

Positives were recorded by 46 of 833 offenders (5.5%) with a total of 88 positive alcohol events reported (1.9 events per participant with a confirmed drinking event).



Of the 46 individuals with a positive alcohol event, only 12 individuals had more than one positive alcohol event reported.

SCRAM: N Positive Alcohol Events

N Positives	N	% of 46
1	34	73.9
2	4	8.7
3	3	6.5
5	1	2.2
6	2	4.3
8	1	2.2
11	1	2.2
total	46	100

Positives and/or tampers were recorded by 193 of 833 offenders (23.2%) and had 426 events (2.2 events per offender). Of all participants, 20 (2.4%) offenders had both a tampering event and a confirmed positive recorded.

SCRAM: N Tampers and Positives

N tampers and positives	N	% of 193
1	113	58.6
2	39	20.2
3	16	8.3
4	6	3.1
5	6	3.1
6	2	1.0
7	2	1.0
8	1	0.5
9	1	0.5
10	1	0.5
11	2	1.0
13	2	1.0
14	2	1.0
total	193	100

5 DEFINITION/ANALYSIS OF RECIDIVISM

Recidivism was defined in two ways for the analysis. The first analysis defines recidivism as any DUI arrest found in the South Dakota Unified Judicial System database from arrest to next arrest for all participants (n=833). Thus, the first analysis includes the time in which the participant was monitored by the SCRAM device as part of the exposure time in the analysis. Five participants had a DUI arrest that occurred between the SCRAM ON date and the SCRAM OFF date.

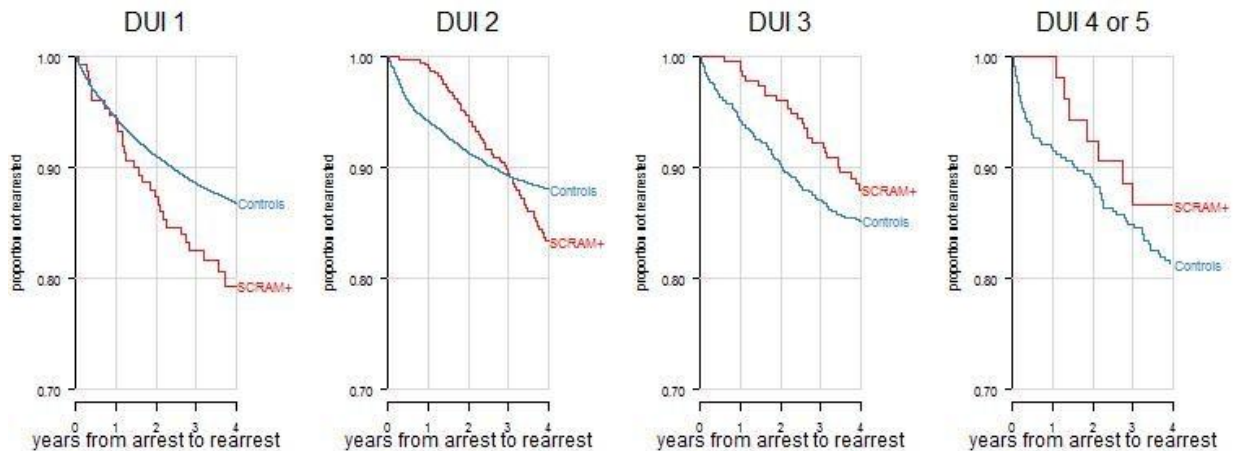
The last arrest data prior to SCRAM monitoring for a SCRAM participant in the sample (n=833) occurred in August 2010. Controls were selected from the South Dakota Unified Judicial System database by DUI level that had arrest dates that fell between August 2003 and August 2010, inclusive. In addition, individuals in the control group did not participate in any form of monitoring as part of the South Dakota 24/7 Sobriety Program. The following table and graphs provides a comparison of recidivism rates by DUI level and year from the initial arrest to future arrest.

DUI re-arrest rates for SCRAM participants is smaller in the initial year following arrest than controls all DUI levels except DUI 1, but this period of time includes a substantial portion of time in which participants were monitored by the SCRAM device. DUI 1 SCRAM participants had a larger recidivism rates compared to controls at all four years. DUI 2 SCRAM participants' recidivism rates rose in the second year following arrest and approximately equaled the control group rate at three years post arrest. By the fourth year from arrest, recidivism rates for SCRAM participants surpasses the controls for DUI 1 and DUI 2 and is nearly equal for DUI 3.

**Comparison of SCRAM Participants to Controls by DUI Level
at 1, 2, 3, and 4 Years Post Initial Arrest Date**
(n = 833)

Controls and SCRAM Participants by Year	DUI 1			DUI 2			DUI 3			DUI 4 or 5		
	n	n recid	% recid	n	n recid	% recid	n	n recid	% recid	n	n recid	% recid
One Year												
Controls	26,952	1,481	5.5%	3,489	201	5.8%	998	58	5.8%	339	29	8.6%
SCRAM	150	9	6.0%	398	4	1.0%	232	2	0.9%	53	0	0.0%
Two Year												
Controls	26,952	2,425	9.0%	3,489	301	8.6%	998	96	9.6%	339	38	11.2%
SCRAM	150	19	12.7%	398	21	5.3%	232	9	3.9%	53	4	7.5%
Three Year												
Controls	24,826	2,916	11.7%	3,371	366	10.9%	989	129	13.0%	336	51	15.2%
SCRAM	125	22	17.6%	382	40	10.5%	227	16	7.0%	51	7	13.7%
Four Year												
Controls	21,538	3,046	14.1%	3,173	389	12.3%	969	146	15.1%	329	61	18.5%
SCRAM	72	16	22.2%	261	40	15.3%	183	22	12.0%	44	7	15.9%

**Survival Curves for SCRAM Participants Compared to Controls by DUI Level
at 1, 2, 3, and 4 Years post SCRAM ON Date**
(n = 833)



For the second analysis, recidivism was defined as the first DUI arrest on or after the SCRAM removal date (SCRAM OFF date) as found in the South Dakota Unified Judicial System database. Participants arrested for a DUI while wearing the SCRAM device (SCRAM ON) were not included in the analysis since the purpose of this analysis was focused on DUI recidivism of SCRAM participants (n = 829 since 4 participants had a recidivism DUI recorded in the South Dakota Unified Judicial System Database between the SCRAM On date and SCRAM Off date) after removal of the SCRAM monitoring device.

Individuals placed on SCRAM with a DUI 1 offense had higher rates of recidivism at 1, 2 and 3 years. Individuals with DUI 2 and 3 offense were found to have a rather low recidivism rates at 1 and 2 year post SCRAM participation with rates at 4% after 1 year and 9% at 2 years. After 4 years, a recidivism rate for DUI 1, 2 and 3 offenders was found to be between 18.6% and 19.3%.

Recidivism by DUI level and Exposure
(n = 829)

DUI Level	Exposure: SCRAM Off date to future arrest			
	1 year (365 days)	2 years (730 days)	3 years (1,095 days)	4 years (1,460 days)
DUI1	8.2% (12 of 146)	14.4% (21 of 146)	18.9% (18 of 95)	18.6% (8 of 43)
DUI2	4.3% (17 of 398)	9.3% (37 of 398)	15.9% (41 of 258)	19.3% (23 of 119)
DUI3	3.9% (9 of 232)	9.5% (22 of 232)	16.7% (28 of 168)	19.3% (16 of 83)
DUI4 or DUI5	7.5% (4 of 53)	11.3% (6 of 53)	17.9% (7 of 39)	16.7% (3 of 18)

Recidivism rates by gender were similar after 1 and 2 years between males and females. At three and four years post SCRAM participation, females had a 5 percentage point higher recidivism rate than males. It should be noted that the sample size for females at years 3 was 108 and at year 4 was 47 individuals and thus caution should be noted in drawing conclusions about gender differences until a larger sample size is available.

Recidivism by Gender and Exposure
(n = 829)

Gender	Exposure: SCRAM Off date to future arrest			
	1 year (365 days)	2 years (730 days)	3 years (1,095 days)	4 years (1,460 days)
Female	5.6% (9 of 162)	9.9% (16 of 162)	20.4% (22 of 108)	23.4% (11 of 47)
Male	4.9% (33 of 667)	10.5% (70 of 667)	15.9% (72 of 452)	18.1% (39 of 216)

Some variations in recidivism rates can be noted in the table below. Individuals between the age of 21-29 and 40-49 have the highest recidivism rates at each year (excluding the 17-20 year olds due to small sample size). It should also be noted that the 40-49 year old age group recidivism rate at 2 years was documented as 12.6%. One would expect the 21-29 year old age group to have rather high recidivism rates based on the risk taking behavior of the age group and documented DUI offender ages. One might speculate that the individuals in the age group of 40-49 are significantly different than the 30-39 year olds or the 50-59 year olds, which might indicate a potential difference in the level of substance abuse and addiction within this sub-group.

Recidivism by Age at SCRAM OFF and Exposure
(n = 829)

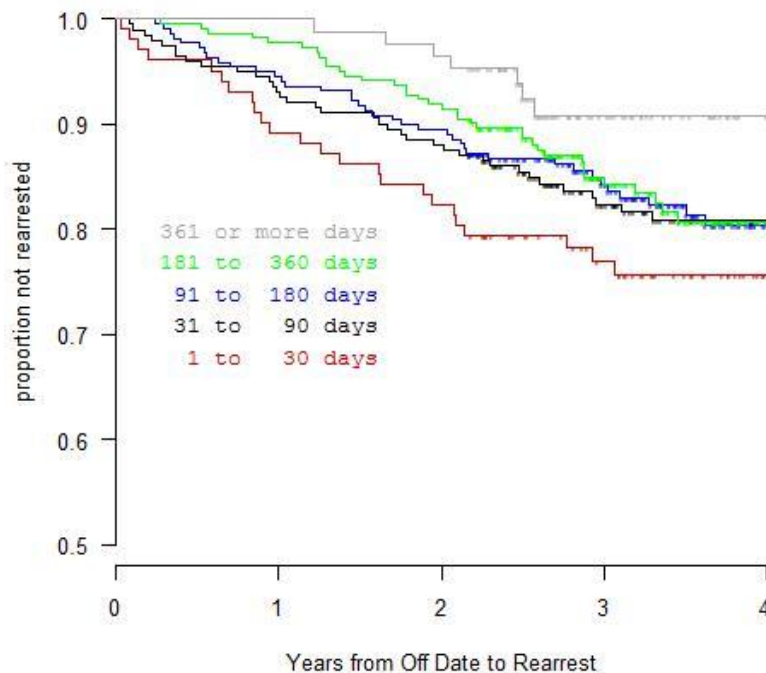
Age	Exposure: SCRAM Off date to future arrest			
	1 year (365 days)	2 years (730 days)	3 years (1,095 days)	4 years (1,460 days)
17-20	5.0% (1 of 20)	15.0% (3 of 20)	26.7% (4 of 15)	27.3% (3 of 11)
21-29	6.8% (20 of 294)	10.9% (32 of 294)	20.5% (39 of 190)	22.7% (22 of 97)
30-39	2.8% (6 of 215)	8.8% (19 of 215)	11.4% (17 of 149)	14.3% (9 of 63)
40-49	6.6% (11 of 167)	12.6% (21 of 167)	19.0% (23 of 121)	20.0% (12 of 60)
50-59	4.1% (4 of 98)	11.2% (11 of 98)	14.0% (8 of 57)	16.7% (4 of 24)
60-72	0.0% (0 of 35)	0.0% (0 of 35)	10.7% (3 of 28)	0.0% (0 of 8)

Variations in recidivism rates were noted by number of days monitored on the SCRAM device. Individuals with lower levels of monitoring had higher levels of recidivism as measured at each year post removal of the device.

Recidivism by Days Monitored and Exposure
(n = 829)

Days Monitored	Exposure: SCRAM Off date to future arrest			
	1 year (365 days)	2 years (730 days)	3 years (1,095 days)	4 years (1,460 days)
1-30	10.8% (11 of 102)	17.6% (18 of 102)	24.7% (20 of 81)	23.8% (10 of 42)
31-90	7.0% (14 of 201)	11.9% (24 of 201)	20.4% (31 of 152)	20.7% (18 of 87)
91-180	5.5% (12 of 219)	10.5% (23 of 219)	13.7% (21 of 153)	19.2% (14 of 73)
181-360	2.3% (5 of 222)	8.1% (18 of 222)	13.6% (18 of 132)	16.0% (8 of 50)
361 +	0.0% (0 of 85)	3.5% (3 of 85)	9.5% (4 of 42)	0.0% (0 of 11)

Recidivism by SCRAM Days Monitored



Comparison of recidivism rates for individuals with tampers and positive alcohol events compared to individuals without tampers or positive alcohol events identified lower rates of recidivism for individuals who had tampers or positive alcohol events documented while monitored by the SCRAM device at 1, 2, 3 and 4 years after the SCRAM device was removed.

Recidivism by Tampers and Exposure
(n = 829)

	Exposure: SCRAM Off date to future arrest			
Tamper	1 year (365 days)	2 years (730 days)	3 years (1,095 days)	4 years (1,460 days)
No Tampers	5.3% (35 of 662)	10.7% (71 of 662)	16.8% (74 of 440)	18.2% (38 of 209)
Tampers	4.2% (7 of 167)	9.0% (15 of 167)	16.7% (20 of 120)	22.2% (12 of 54)

Recidivism by Positive Alcohol Events and Exposure
(n = 829)

	Exposure: SCRAM Off date to future arrest			
Positive	1 year (365 days)	2 years (730 days)	3 years (1,095 days)	4 years (1,460 days)
No Positive	5.1% (40 of 783)	10.5% (82 of 783)	17.0% (90 of 528)	19.4% (48 of 248)
Positives	4.3% (2 of 46)	8.7% (4 of 46)	12.5% (4 of 32)	13.3% (2 of 15)

Tamper/Positive Alcohol Events and Exposure
(n = 829)

	Exposure: SCRAM Off date to future arrest			
Tamper/Positives	1 year (365 days)	2 years (730 days)	3 years (1,095 days)	4 years (1,460 days)
No Tamper/ Positives	5.5% (35 of 636)	11.0% (70 of 636)	17.3% (73 of 421)	19.0% (38 of 200)
Tamper/Positives	3.6% (7 of 193)	8.3% (16 of 193)	15.1% (21 of 139)	19.0% (12 of 63)

6 SUMMARY/CONCLUSION

Substantial research has supported the effectiveness of the SCRAM technology to identify alcohol consumption events as noted in the initial section of this report. Other published articles and reports have documented the effectiveness of the device to monitor offenders while the device is worn by the offender. To date there have been few studies of recidivism behaviors of SCRAM participants that examine recidivism once the bracelet has been removed. A literature search identified a small handful of published research findings that have followed and tracked the outcomes of SCRAM participants once the device is removed. The purpose of this analysis was to document DUI recidivism offense rates for SCRAM bracelet users who participated in the South Dakota 24/7 Sobriety Program. The results presented above are based on a retrospective review of SCRAM participants monitored between 2006 and September 2010 with a SCRAM device removal date of October, 2010. A minimum of 2 years of exposure in which to examine recidivism was available for all participants.

The findings suggest that recidivism rates decrease as the number of days monitored increases at 1 year and 2 year post monitoring. This recidivism rate pattern is consistent with the conclusions of Flango and Cheesman (2009) who suggest that “it appears that the intervention must last at least 90 days to reduce the probability of future re-offenses”. The recidivism pattern may be more complex as time passes. While those monitored for longer periods of time have lower rates at all follow-up years,

the recidivism pattern begins to rise as time passes. The data available for analysis includes a full 2 years of data on the entire sample and adequate sample sizes for analysis at years 3 and 4 post arrest. A complete picture of recidivism patterns at 3 and 4 years is emerging based on the recidivism data available, and that data indicates that the recidivism rates for DUI 1 and 2 SCRAM participants equals or exceeds the control group rates at 3 years post arrest. Recidivism rates for DUI 3 SCRAM participants approximately equals the rate of recidivism for controls at 4 years post arrest. Thus, the data suggests that reductions in recidivism initially gained during the SCRAM monitoring period and in the initial years after removal of the device are not sustained over time.

Another finding that warrants further exploration and consideration is the recidivism patterns of individuals in the 40 to 49 age group. The recidivism pattern of this group was similar to the recidivism pattern for individuals' ages 21 to 29 years. Based on the recidivism pattern for the 40 to 49 year old age group it would appear that this group is at an elevated risk for recidivism. The data set used for analysis did not include data on diagnosis or treatment and thus the level of addiction and/or diagnosis was not a part of the analysis. One could speculate that the characteristics of this age group might be fundamentally different and include individuals that require higher levels of treatment.

In conclusion, the data examined as part of this analysis supports the effectiveness of the SCRAM device as a tool for monitoring alcohol consumption of offenders while the device is worn by the offender. The analysis of the data, however, indicates that once the device has been removed, behavior change is not sustained, as over time recidivism rates begin to approach or exceed the recidivism rates of controls.

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