Mandating Interlocks for Fully Revoked Offenders: The New Mexico Experience

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Objective. In New Mexico, between July 1999 and December 2002, the installation of an ignition interlock was an optional judicial sanction for second and third driving-while-impaired (DWI) offenders. This is a study of the recidivism of 437 offenders who were convicted and installed interlocks for an average of 322 days during that period.

Methods. The comparison group was a stratified random sample (N ~ 12,554) of the 20,949 offenders who were convicted during the same period but did not install interlocks. DWI arrest and conviction data for all study participants were received from the Motor Vehicle Department’s Citation Tracking System.

Results. Only 11 (2.5%) of the interlock offender group were rearrested for DWI while interlocks were installed, whereas 1,017 (8.1%) of the comparison group were rearrested during an equivalent 322-day period. Survival graphs and Cox proportional hazard regression analyses were used to compare the interlock and noninterlock groups during installation, after installation, and for the entire period up to December 2004. Results indicate a reduction in recidivism of 65% during installation. After removal, there was no significant difference in recidivism rates in a 3-year follow-up period. Following all offenders for 4 years, including both the period while the interlock was installed and the period after its removal, indicates that the difference in recidivism achieved during installation, though not increased, is maintained, so at the end of 4 years, interlock users still have lower total recidivism than nonusers.

Conclusions. The magnitude of interlock effectiveness reported here is similar to those in other published studies with comparable samples.

Keywords DUI; DWI; Impaired Driving; Interlock; Recidivism; Mandatory; New Mexico

There is substantial evidence that interlock devices, which require the driver to take a breath test to start the car, are effective in reducing the recidivism of drivers convicted of driving while impaired (DWI) by 35 to 75% while installed on the vehicle (Coben & Larkin, 1999; DeYoung et al., 2004; Voas et al., 1999). A recent meta-analysis by Willis, Lybrand, and Bellamy (2005) found that, while installed, the interlocks reduced DWI recidivism to 0.36 of that of noninterlocked offenders. A major limitation to their programmatic effectiveness is the low installation rate due to the reticence of judges to impose interlocks and the resistance of offenders to install these devices due to cost and conflict in laws. Generally, less than 20% of offenders eligible for interlock programs install the devices (Voas et al., 1999, 2002). De Young (2002) conducted a survey of judges in California and found that, although some judges questioned the effectiveness of interlock devices, most did not order installation of an interlock because of the cost, the offender’s claim of not owning a car, and the effort required to monitor compliance with the program. The offenders’ motivations for not installing interlocks are less clear, although the cost of the device, the high cost of insurance, and the relative ease of driving illicitly without a high risk of apprehension probably played a role.

A significant impediment for judicial interlock programs in many states that provide for interlocks as a condition of probation has been conflicting laws requiring a minimum "hard" (no driving) suspension period for multiple DWI offenders. Because up to 75% of revoked offenders drive illicitly to some extent during their suspensions (McCartt et al., 2002; Ross & Gonzales, 1988), there is justification for requiring interlocks even if the offender is fully revoked. Judges, however, have strongly resisted this (DeYoung, 2002), arguing that it sends the wrong message to offenders (i.e., the court expects them to drive illicitly). Further, judges often find it is difficult to justify the installation cost (circa $75) and the service charge...
(circa $2.30 per day) for a device that the offender is prohibited from using. Consequently, few fully revoked DWI offenders are ordered by the courts to install interlocks, and of those few offenders, only a small percentage install the device.

De Young (2002) reported on a particularly dramatic example of the barriers to imposing interlocks on fully revoked offenders in the state of California, where judges ordered the interlock on only 83 (10%) of 887 convicted drivers mandated to receive interlocks and only 18 (2%) of the offenders actually installed the devices. Despite these limitations, DeYoung (2004) found that offenders who installed the units under court order exhibited an 18% lower recidivism rate. This is a smaller reduction than the 50 to 90% reduction generally found for offenders who can legally drive when they install the interlock, but it does indicate that interlocks, while installed, can reduce illicit driving by fully revoked drivers. Because the Federal Transportation Equity Act for the 21st Century (TEA-21), which puts pressure on (he states to mandate a full year’s license suspension for second offenders, potentially interferes with existing state court interlock programs, additional information on the efficacy of the interlock on fully revoked offenders would appear to be useful.

Our study considers the efficacy of interlocks in a context similar to California’s, where judges mandate interlocks for offenders who were ineligible for any license to drive legally. From July 1, 1999, to January 1, 2003, New Mexico had a law making ignition interlocks an optional judicial sanction for second and third DWI offenders, while another New Mexico law required a 1-year hard suspension for second DWI offenders. A judicial requirement to install an interlock did not affect the suspension status of the offender. As a result, 95% of the subjects of the current study were revoked at the time they installed interlocks. For this New Mexico study, records of interlock installations were available, so it was possible to replicate the similar study in De Young’s 2004 paper.

METHODS
Defining Interlock and Comparison Groups
In New Mexico, interlock service providers were required to forward records of all installations and removals to the state Traffic Safety Bureau. These data for offenders who installed interlocks from July 1, 1999, to December 31, 2002, were matched with DWI arrest and conviction records in the New Mexico Motor Vehicle Division DWI Citation Tracking System (CTS). The CTS, developed as a statewide offender tracking system, contains the records of every driver arrested for a DWI offense in New Mexico. Our objectives were to determine the recidivism rate of those who installed interlocks compared to similar offenders who did not install units during three periods: (1) while the interlock was on the car, (2) following removal of the interlock, and (3) over a 4-year interval (that combined periods 1 and 2).

Based on installation records received from interlock providers (98% of which could be matched with the New Mexico Motor Vehicle Division DWI CTS records), 437 multiple offenders installed interlocks between July 1, 1999, and December 31, 2002. During that same period, 20,949 other multiple offenders were convicted but did not install interlocks, indicating that less than 5% of the offenders installed interlocks during that period. Of the 437 interlock cases, 415 removed the units before the end of the study period. Based on the CTS record, the licenses of 94.9% of the interlock offenders were revoked before they installed the device, 2.3% had reinstated before installing the interlock, and 2.8% could not be matched with a revocation record.

A histogram of the time between conviction and interlock installation for the 378 offenders who installed interlocks within one year of conviction is shown in Figure 1. The mean time between conviction and installation was 0.19 years or 70 days. A histogram of the times between installation and removal for the 415 offenders who removed their interlocks before the end of the study period is shown in Figure 2. The mean installation period was 0.77 years (281 days). The long tail of the graph, consisting of 41 persons with installation durations longer than 400 days, was apparently composed of offenders for whom the probation department may have extended the requirement or who voluntarily kept the interlocks installed.

Stratified Random Sampling of Noninterlock Offenders
A clear concern in comparing the relatively small group of interlock users with the much larger group of nonusers is that those who installed the units may be a select set of offenders with a lower risk of recidivism. In an effort to produce groups with equivalent recidivism risk, DeYoung (2004) used the propensity score procedure described by Rosenbaum and Rubin (1985). We used an equivalent procedure designed to ensure the inclusion of the largest possible number of the cases from the
This procedure maximized the inclusion of available offenders who did not install interlocks and yielded a 12,554-member comparison group having the exact same proportion in each of 16 matching categories as in the interlock group. Consequently, the comparison group and the interlock group were each composed of 84% males, 73% of whom were aged 31 or older. Each group had 51.6% second offenders and 49.4% third or more frequent offenders, and 66.8% of the members of each group had arrest BACs of .16 or higher or had refused the breath test (refusers had recidivism rates similar to those with BACs of .16 or higher).

Survival rates for the comparison and interlock groups were then compared using Cox regression with covariates with the same bivariate structure for arrest BAC, age, gender, and priors as used in the matrix procedure described above to further reduce the influence of those factors in the analysis. Recidivism events included a subsequent arrest for DWI. Three analyses were conducted. The first analysis compared the recidivism rate for interlock users with the comparison group while the interlock device was installed on the vehicle. The second analysis covered the period following interlock removal for approximately 3 years to the end of the study period. The third analysis covered the total 4-year period from the same starting point as the first analysis. It was designed to evaluate the overall impact of the interlock, combining both the period while the unit was installed and the period after it was removed for the interlock group.

Because the average time between conviction and installation for the interlock group was 70 days (Figure 1), the index time for the comparison group was shifted to 70 days (0.19 years) after conviction for the first and third analyses. The purpose of this shift was to make the beginning of the exposure period the same for both groups. For the second analysis covering the post-interlock period, an additional 281-day (total 70 + 281 = 351) shift of the index time for the control group was included to match the average interlock removal time of those in the interlock group (Figure 2). For each analysis, those who reoffended before the index time were excluded. For the first and third analyses, control group was reduced to 12,340 by the exclusion of the 17 persons whose previous arrest BACs of .16 or higher or who refused to take a breath test. For the interlock group, the index time was 70 days (0.19 years) after the date of the conviction, the index time for the control group was shifted to 70 days (0.19 years) after the date of the conviction, and the index time for the interlock group was 70 days (0.19 years) after the date of the conviction. For the third analysis covering the post-interlock period, the comparison group was shifted to 70 days (0.19 years) after the date of the conviction.

RESULTS

Based on the procedures described above, it was possible to examine the recidivism rates of interlock users, relative to nonusers, during three periods: (1) while the interlock was on offenders’ vehicles, (2) after the interlock was removed, and (3) for the sum of both periods, which provided the best comparison with the earlier work of DeYoung (2004).
Table I  Results of the Cox regression analysis of recidivism while the interlock was installed on the vehicles of multiple offenders

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>Sig</th>
<th>R</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.4337</td>
<td>0.0630</td>
<td>47.4598</td>
<td>1</td>
<td>0.000</td>
<td>0.6481</td>
<td></td>
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<tr>
<td>BAC</td>
<td>0.3079</td>
<td>0.0659</td>
<td>21.8399</td>
<td>1</td>
<td>0.000</td>
<td>0.8200</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.0432</td>
<td>0.0803</td>
<td>5.9020</td>
<td>1</td>
<td>0.000</td>
<td>1.0442</td>
<td></td>
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<tr>
<td>Prior DWI</td>
<td>0.2284</td>
<td>0.0601</td>
<td>14.4365</td>
<td>1</td>
<td>0.000</td>
<td>1.2566</td>
<td></td>
</tr>
<tr>
<td>IID vs. SRS</td>
<td>-1.0753</td>
<td>0.3030</td>
<td></td>
<td>1</td>
<td>0.000</td>
<td>.3412</td>
<td></td>
</tr>
</tbody>
</table>

Table II  Results of Cox regression analysis of recidivism during the post-interlock period

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>Sig</th>
<th>R</th>
<th>Exp(B)</th>
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<tbody>
<tr>
<td>Age</td>
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<td>0.0467</td>
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<td>0.6756</td>
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<td>BAC</td>
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<td>0.0469</td>
<td>16.3699</td>
<td>1</td>
<td>0.000</td>
<td>1.2725</td>
<td></td>
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<tr>
<td>Gender</td>
<td>0.1655</td>
<td>0.0610</td>
<td>7.3630</td>
<td>1</td>
<td>0.006</td>
<td>1.1800</td>
<td></td>
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<tr>
<td>Prior DWI</td>
<td>0.2331</td>
<td>0.0439</td>
<td>28.1327</td>
<td>1</td>
<td>0.000</td>
<td>1.2625</td>
<td></td>
</tr>
<tr>
<td>IID vs. SRS</td>
<td>-0.0390</td>
<td>0.1190</td>
<td></td>
<td>1</td>
<td>0.7432</td>
<td>.9618</td>
<td></td>
</tr>
</tbody>
</table>

On the Interlock

Table I provides the results of the multivariate Cox regression analysis with dichotomous covariates for age, BAC, gender, and prior for the period that the interlock was on the vehicles of those offenders who installed the device. For each variable, the regression estimates the recidivism ratio for the two subgroups of that variable. For the age variable, the regression indicates that the recidivism rate of those aged 31 and older is only 65% (Exp(B) = 0.6481) of that for those aged 30 or younger. The recidivism rate for those who refused or had BACs > 0.16 is 1.36 times that of those with BACs < 0.16. The recidivism rate of males was not significantly higher than that of females, ratio = 1.04, p = .59. Those with three or more DWI convictions were 1.26 times more likely to recidivate than second offenders.

The "Sig" is the p value for each estimate. It indicates, as might be expected, that prior arrests, arrest BAC, and age have a significant relationship to recidivism. The multivariate analysis adjusts for any potential biases due to differences in covariates and estimates the recidivism rate of the interlock group to be 0.34 of the comparison group's. The small p value, 0.0004, indicates that the recidivism ratio is unlikely to have occurred by chance but the relatively small size of the interlock group results in a relatively large 95% confidence interval, 0.19 to 0.62.

Figure 3 presents a graphical comparison of the recidivism versus time for the interlock and the comparison groups while the device was on the vehicle of the interlock group. By the end of a 1-year period after installation, only 3% of the interlock group had reoffended, compared to more than 9% of the comparison group. Both the regression and the recidivism curves indicate that members of the comparison group were three times more likely to be rearrested than the interlocked group.

After Removal of the Interlock

The Cox regression analysis of recidivism during the post-interlock period, with covariates as before for prior arrests, BAC, gender, and age is shown in Table II. All of the covariates were significant, and when their influence is removed, the recidivism rate of the interlock group after interlock removal is indistinguishable from that of the comparison group. The recidivism ratio is 0.96 with a 95% confidence interval from 0.76 to 1.21. The recidivism curves are shown in Figure 4.

Overall Period

Table III provides the results of the third analysis covering a 4-year period beginning 70 days after conviction (the average point at which offenders installed interlocks) that encompasses both installation and post-installation conditions for the interlock group compared to the noninterlock group. As before, covariates for prior arrests, arrest BAC, gender, and age were included in the Cox regression analysis and the rearrest rate ratios for all covariates are significant. With the impact of those demographic variables controlled by the multivariate Cox regression, the rearrest rate for the interlock group was 0.78 of that for the control group.
group with $p = 0.02$. A graphic presentation of the recidivism curves is presented in Figure 5.

**DISCUSSION**

Interlocks were originally introduced as a voluntary program for DWI offenders, primarily to permit DWI offenders to drive while protecting the public by ensuring that offenders could not operate their vehicles while impaired. The success of the interlock units while installed on the vehicle (Coben & Larkin, 1999; Willis, Lybrand, & Bellamy, 2005; Voas et al., 1999) has led to the passage of laws mandating their use (Voas, 2003). A major limitation to mandating interlocks effectively, however, is the reluctance of the courts to order their use and the resistance of offenders to installing them when they are not permitted to drive because of conflicting state license suspension requirements (DeYoung, 2002; Voas, 2001).

DeYoung found that, under these conditions in California, those offenders who installed interlocks had an 18% lower recidivism rate over the following 4 years (1,300 days). Our objective was to replicate that study in New Mexico. Our results over a similar 4-year period indicated that offenders with interlocks had a 22% reduction in recidivism (Table III). We separated the recidivism occurring during the period when the interlock was on the car from the period following its removal. While on the vehicle, recidivism was reduced two-thirds (66%), but after the interlock was removed, there was no significant difference in the recidivism rates.

The similarity of our results in New Mexico with those of DeYoung in California (22% compared to 18%) is striking. It also is interesting to note that the rearrest probability ratio of 0-34 while the interlock was on the vehicle in the current study is almost identical to the .36 reported by Willis, Lybrand, and Bellamy (2005) in their meta-analysis of interlock studies. This suggests that, although a conflict between suspension requirements and interlock installation may substantially limit the use of such devices, revoked offenders who are forced to install the units by the court when they are not free to drive, experience similar reductions in recidivism to offenders who voluntarily install the devices when their use results in the issuance of a limited driving permit allowing them to drive the interlock car legally.

This study has several limitations. Despite the effort to equate groups through stratified random structuring of the comparison and the use of covariates in the Cox regression, it is possible that the contrasting groups are not entirely equivalent as would occur through a random trial. The interlock group is a small, possibly select sample of all offenders for which controls for demographic and prior record factors do not entirely compensate for group differences. It is not entirely clear whether those who installed interlocks should be expected to have lower recidivism because less problematic offenders may be more likely to install the devices, or those who are forced to install units by the judges may be offenders whom they view as most likely to continue to drink and drive. However, the almost identical recidivism rate of the interlock users and the control group in the period following removal of the device from the vehicle suggests that the two groups are not significantly different in the level of recidivism risk.

The number of offenders in our study who installed interlocks was too small to determine the impact on crash involvement. This is an important limitation because DeYoung et al. (2004) found that non-alcohol-related crashes increased among offenders who installed interlocks. He attributed that finding to increased exposure due to increased driving by interlock users. Most crashes do not involve alcohol, and the interlock would not be expected to reduce non-alcohol-related crashes. So if the presence of the interlock results in driving more than when fully revoked, then the increase in non-alcohol-related crash involvement would not be unexpected.

Like most of the previous interlock studies, we did not have access to court or treatment records, so we could not consider those interventions in our analysis. There is no evidence, however, that indicates any difference between interlock and comparison offenders in the other sanctions they received. We also had no way to measure the amount of illicit driving by either group. State records tend to be imperfect in tracking offenders who move to another state. Those who move to another state will not accumulate offenses in New Mexico. This record problem is more likely to produce a reduction in recidivism among the comparison revoked drivers who are more likely to be able
to leave the state without notice than interlock participants who must report each month to have their units checked.

A feature of these results not in the DeYoung et al. (2004) study was the separate evaluation of the on-interlock and post-interlock periods. Consistent with prior studies (Voas et al., 1999; Willis, Lybrand, and Bellamy, 2005), we found that the reduction in recidivism rate achieved during installation does not continue after the device is removed from the car, but the total difference in recidivism accumulated during the interlock period is sustained after removal. This difference in cumulative recidivism is arguably the most important measure of a sanction that is intended to reduce drunk driving. The fact that the difference in cumulative recidivism is sustained after interlock removal implies that the benefit achieved during interlock installation is permanent.

A limitation in all the studies of the potential carryover effect is the difficulty of equating the interlock periods based on matching interlock and noninterlock groups. Perhaps the most precise method would be to match interlock with comparison offenders on a case-by-case basis, but this involves a very intricate process when an effort also is made to match on a set of covariates. For this study, fixed periods were used based on the overall distribution of the interlock installation times and the interlock-on periods. This approximation of the relevant periods following conviction compensates, although somewhat imperfectly, for problems, such as prospective interlock users who recidivate before installing the device and therefore do not appear in the interlock group. So it is appropriate to eliminate from the comparison group those who recidivate during the period between conviction and interlock installation (the average time is 70 days for this study).

Finally, this study illustrated that a law giving judges the option to mandate interlocks for second and third DWI offenders who could not legally drive even if they installed interlocks resulted in very few (less than 5%) interlocks being installed. Nonetheless, the law still demonstrated that interlocks reduced recidivism, even among fully revoked offenders who could not drive legally and would have been subject to arrest even when operating the interlocked car. New Mexico has passed additional interlock laws in 2002, 2003, and 2005, and research currently is underway on the effectiveness of those laws at getting more interlocks installed and reducing recidivism.

ACKNOWLEDGMENTS

This work was supported by the National Highway Traffic Safety Administration (contract number DTNH22-02-D-95121) and the National Institute on Alcohol Abuse and Alcoholism (grant number K05 AA014260). The results and opinions reported in the article are those of the authors and not necessarily those of the supporting agencies. The authors also express thanks to those who provided access to the Citation Tracking System and the Interlock Installation and Removal data: Larry Kehoe, Director of the New Mexico Motor Vehicle Department; Michael Sandoval, Bureau Chief of the New Mexico Traffic Safety Bureau; and James Davis, Director of the University of New Mexico Division of Government Research.

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