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**Introduction**

This Volume II report of the ICADTS Working Group on Alcohol Interlocks summarizes developments in recent years. It is not a comprehensive review, but it does capture some of the successes, problems, and new directions that are underway around the world. This 2005 Volume II fills in some program detail that was lacking in 2001 when the Volume I overview was issued. With the benefit of hindsight, we can now conclude that the content of Volume I has stood up well and remains a valid statement of the promise and challenges of interlock programs.

There have been some important program developments since the first report.

- **Sweden** has significantly expanded its interlock program targeted toward high-risk operators. It has pioneered development of primary prevention programs in which interlocks are installed not only in the vehicles of known DWI offenders, but also in whole fleets of vehicles. Sweden also is moving toward a 2012 implementation date for interlocks in all vehicles.

- **New laws in New Mexico USA** now require interlocks for all DWI offenders and allow for quick installation of an interlock following an alcohol conviction. In addition, the New Mexico laws provide an option that allows revoked DWI offenders to acquire an interlock-only driving license in lieu of a full prohibition of driving. All of these measures have been taken to reduce the high rates of driving while suspended among convicted alcohol offenders.

- **Australian interlock programs**, slow to unfold despite having the first written national standard in early 1990, have now begun to pick up due to a mandatory law in Victoria. Other states are at various stages of implementing programs. In time, Australia will likely give us the best information on the practicality of deeply rural interlock programs.

- **Interlock programs in Canada** continue to expand, and currently there are interlock programs in five or the six most populous provinces. In total, 81% of the Canadian people reside in a province or territory where interlock programs are available.

- **The European Union** has launched a four-nation pilot program to evaluate some aspects of public acceptance of interlocks. Some regions, such as Annecy in the Haute Savoie of France, have begun very significant interlock programs, and CENELAC, the European Standards Committee, has nearly completed an interlock standard.

Communication has improved among interlock research and program people due to the growing success and attendance at the annual Ignition Interlock Symposia (IIS). These symposia have been supported by a consortium of interlock manufacturers, managed by the Traffic Injury Research Foundation, and endorsed by ICADTS. The attendance has grown each year since the initial meeting when two dozen of us sat around a table in Montreal. Following on the heels of the 5th IIS meeting of October 2004 with 135 participants in Tempe, Arizona, the 6th IIS annual meeting will convene in Annecy, France, in September 2005. So far the interests of the safety research community and the manufacturers have been complementary, and these meetings have served the needs of both groups. Both groups believe public safety interests will be served if more well-monitored interlock programs take root. The IIS paper sessions have provided opportunities for researchers, vendors, and government officials to exchange information more regularly than would be possible if the 2- or 3-year meeting cycle of ICADTS were the only forum available.

Although the collaboration between public and private interests at IIS continues, the ICADTS Working Group on Alcohol Interlocks is attentive to potential conflicts of interest that might arise if the IIS program agenda were tilted more toward supporting private industry interests rather than those of alcohol safety. It is important to maintain a path that keeps public safety interests foremost with a broad cross-section of interlock researchers and program managers setting the agenda for these meetings.

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September 2005
Background

A benefit of drawing data and opinions from a multinational group of investigators is having the opportunity to learn from the successes and failures of differing program design efforts. Different local circumstances inevitably lead to a form of social ecological experimentation, and the knowledge that comes from this helps clarify strengths and limitations of technology such as the alcohol ignition interlock, or “alcolock,” as it has become known in Europe.

Those of us who write and read documents like this one seek novel ways to use technology to help resolve social problems. We have arrived at an interesting developmental waypoint. So far, we have some consensus on how to use alcolock technology effectively. Those insights were summarized as an overview in Volume I of these ICADTS ignition interlock reports. Beyond the generalities in Volume I, there is a variety of program approaches being pilot-tested, implemented, evaluated, guessed-at, hoped-for, and discussed. Many are designed around local compromises that reflect the contributions of many interested parties: advocates of safety, health, government, law, victims, business, and science. This volume discusses some of the directions that have been taken in new program designs in Australia and the European Union and new evidence that has been developed in the past 3 years from mature programs in the United States, Sweden, and Canada. It is not comprehensive, but it does highlight some of the many directions that are being explored.

All developmental paths lead from the present into a future we can only guess at today. Identifying some of these paths today may accelerate and maximize the potential public safety benefit of this technology leading to a future with fewer alcohol-related road deaths and injuries.

The following describes some of the developmental paths that lie ahead:

1. There is a hardware path in which manufacturers compete to deliver more features for lower cost while improving data security. In the future, the interests of interlock manufacturers may intersect with those of the automotive industry. It would seem that installation of these devices could be simplified if all concerned were willing to standardize around a compatible interface (such as a universal plug) between interlocks, vehicle electronics and on-board computers. Alternatively, the automotive industry may offer its own interlock designs. We expected to have a contribution to this document from an automotive industry association, but their failure to find a consensus perspective among their six member companies led to withdrawal of their paper from this volume. We do know, however, that alcohol interlocks have made it into their collective consciousness because the automobile alliance began seeking us out in mid-2004 at the Glasgow meeting of ICADTS. Their interest was piqued by legislation introduced in New Mexico to require interlocks in all cars and
Sweden’s comprehensive plans for a national interlock requirement by 2012. Any such initiative from the manufacturers is a long time off, however. As of 2005, the auto manufacturers have already closed out features for their 2009 model year platforms and are working on 2010 cars. Consequently, anything that comes directly from the auto industry is likely to be at least 5 years away.

2. There is a service program path concerned with monitoring offender compliance and determining how best to report to the administrative authority. This area is now undergoing evaluation to link interlock service programs to behavior change services. Efforts also are underway to link the driver interlock BAC tests, clinical indicators of alcohol consumption, and referral to external treatment services. Some service programs are managed by interlock companies, and in some cases, the interlock manufacturer will work out a service agreement with an existing automotive service company. There are pros and cons to both approaches. One of the papers in this volume represents the views of an automotive aftermarket service provider in Quebec, which has installation facilities throughout the province. The widespread availability of service centers may be one factor that has helped Quebec achieve its high rates of installation. The use of existing automotive providers to manage interlock programs has received some criticism because of role conflicts between the desire to meet customers’ needs and the necessity of enforcing program rules. But such tradeoffs may be warranted, especially since this delivery model may help solve the problem of providing service in rural areas. The cost of service delivery in rural areas is proving to be a significant problem in Australia and remote parts of North America. Two papers address this problem.

3. There is a data-mining path that extracts information from the interlock record and makes it useful to safety and health interests. This path is a natural link to the treatment intervention community because it uses the information recorded and stored in the interlock device to predict future impaired-driving risk with high accuracy. Use of these data may become more common as the stored record of breath tests results can be useful to both treatment services and sanctioning authorities. An ideal use will be for the relevant authority to make relicensing contingent on personal risk indicators; that is, require continual interlock restrictions for drivers who often have elevated BAC tests. This has been labeled as “criterion-based sentencing” or alternatively “compliance-based removal.” It has been the subject of investigation in several jurisdictions and one of the papers in this volume describes the predictive utility of these data records.

4. There is an equipment certification path that involves standards managed by governments. With careful framing, this path can help support all the other paths in navigating toward maximization of public health and safety. Currently, in 2005 the United States is updating its 1992 Model Specifications for interlocks, and at the same time, CENELAC, the European Standards Committee, is finalizing its
own interlock standards. There is hope that these can be harmonized to a considerable extent.

5. There is a **sanctioning** path for offenders that can lead to judicially mandated interlock programs, administratively offered interlock programs, or both. One sanctioning path, not often used but shown to be an effective way to increase utilization, is to offer the interlock as an offender-selected alternative to jail or house arrest. When the alternative is more restrictive than the interlock, the interlock shows evidence of being embraced by the courts and the offenders. The state of New Mexico in the United States has strongly embraced the interlock, and a slate of mutually supportive laws has resolved some of the barriers to more widespread interlock use. Two papers describe aspects of the New Mexico program and the manner in which this state has attempted to resolve the conflicts that arise between hard suspension, interlocks and the need to get more offenders onto interlocks.

6. There is a **prevention** path being evaluated that might result in wider use of the interlock as a primary preventive tool if devices were installed on whole fleets of vehicles. This direction has at least two features that are under evaluation now. These include the Swedish law and European Union trials to place interlocks in whole fleets of vehicles (eg, buses, trucks). There are papers in this volume that describe both the Swedish program and the multinational European pilot programs. In addition, another variation on this theme was opened by a legislator in the United States who introduced a bill that would have made interlocks mandatory in all cars sold in his state. The bill did not become law but the debate has begun, and it has aroused intense interest by automobile manufacturers.

7. There is a **personal identification** path that could evolve from hardware currently being evaluated that would definitively link the vehicle driver to the breath test unlike today when there is no direct link between an individual and a breath test because the interlock is a vehicle sanction. Another method for linking personal risk to the individual will be the use of blood-borne alcohol biomarkers. The biomarker and interlock evidence may well prove to be the strong tandem behavioral and biological evidence needed to prevent awarding future unrestricted driver’s licenses to high-risk drivers who have proven themselves a public hazard. One paper introduces this concept. This would only work, however, with adequate monitoring and enforcement.

8. There will be a **continuous alcohol-monitoring** path as the technology involving **alcohol biosensors** begins to play a more active role in the restraint of alcohol-affected drivers, much as vehicle interlocks do today. Currently, electrochemical transdermal alcohol sensors are being used to enforce court orders to not drink at all. Alcohol vapor sensors attached to the skin surface could be made to work in concert with breath alcohol ignition interlocks. One company has reported development of an alcohol sensor based on rear-infrared spectroscopy
that can “look” under the skin surface to estimate alcohol concentration.

9. There may be a future insurance path if automotive insurance companies can find a business model that allows them to participate in public safety interests; alternatively, government could impose this requirement much as they do now for other high-risk drivers. Conceivably, alcohol interlocks may be viewed one day as insurance premium rate-offsetting safety equipment, much as airbags are today. One of the contributions to this volume describes the many barriers to engaging the private insurance industry as a partner in public safety.

The contributions that make up this Volume II describe program approaches or pilot evaluations in some parts of the United States, Canada, Sweden, Norway, Spain, Belgium, Germany, Netherlands, and Australia. Implementation issues that are discussed in this volume include the following:

- The low rate of interlock utilization relative to the apparent potential benefit of more widespread use.
- The problems of working with judges and courts and the tentative reception of interlock programs by many courts.
- The possible ways of blending the interlock programs with treatment services and possible ways to motivate DUI offenders to embrace behavior change.
- The potential benefits of making interlock installation and service available from private automobile aftermarket vendors who do not ordinarily work with offender populations.

When reviewing interlock research and development, it is important to always keep in mind that the interlock device is different from an interlock program. The program is best thought of as the device plus the supportive services that are needed to help the offender understand how best to comply with the device requirements. Also it is important to distinguish between the interlock program that an offender is enrolled in and a jurisdiction’s interlock program or interlock law. Just because a law has been written requiring judges to order interlocks does not mean that interlocks will be installed, and if installed, it does not mean they will be adequately monitored. The paper from California is a good example of this. The California program of judicial mandates has been weakly implemented. This is partly due to conflicting requirements placed on the judges and partly due to judicial disinterest. Accordingly, weak outcomes from the California interlock program (e.g. law) often reflect the legal context of those interlock program enacted but do not necessarily mean the interlock program at the user level (e.g., the device plus supportive services) is not working as intended. The California data show interlock device efficacy similar to those reported by other investigators; however, the California interlock program effectiveness (that is, the implementation of laws) is weak.
In reviewing interlock work, it is important to keep in mind that this is a rapidly changing picture. The contributions in this Volume II give a snapshot of some of the developments as of 2005.

A note on editing and usage

Because the authors of these papers are accustomed to writing in slightly differing standards of the English language, there has been no attempt to convert all usage into an American or UK variant for the purpose of uniformity. Therefore, spellings of some words will differ (eg, “offence”/“offense” and “behavior”/“behaviour”) throughout this volume. When there has been editing for grammatical clarity, it has been undertaken with the intention of retaining the author’s own words, whenever possible, and the author’s meaning always (we hope).
Section 1:
Research Findings
Primary and Secondary Prevention of Drinking and Driving by the Use of Alcolock Device and Program: The Swedish Experience

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Abstract

To prevent drinking and driving, alcolock (or alcohol-interlock) devices and programs were introduced in Sweden in 1999. Two types of prevention programs were begun. A primary prevention strategy was initiated to prevent alcohol impaired driving by individuals not pre-selected for having prior DWI (driving-while-intoxicated) offences. This approach was first applied as a pilot project in three commercial transport companies (buses, trucks, taxis). In addition, a secondary prevention trial was begun as a voluntary 2-year program for DWI offenders involving strict medical requirements, including counseling and regular checkups by a medical doctor. The program did not require a prior period of hard suspension and focused on changing alcohol use habits.

After some early problems/hesitation, alcolocks in commercial vehicles have finally been well accepted by professional drivers, their employers, and their passengers. Because of public interest, the commercial operators in the supported pilot project have continued using the alcolock devices, and the number of vehicles with alcolocks as a primary prevention measure is rapidly growing in Sweden. We found that 3 of 1000 starts in the primary prevention program were blocked by the alcolock after measuring a BAC (blood alcohol concentration) higher than the legal limit and lock point of .02% (20 mg/dl).

The results from the secondary prevention strategy are limited as only 11% of eligible DWI offenders took part in this voluntary program. Of these, 60% had diagnoses of alcohol dependence or abuse and 68% self-reported dangerous or harmful alcohol habits when starting the 2-year program. During the program, alcohol consumption generally decreased significantly as measured through five biological alcohol markers, and the rate of DWI recidivism fell sharply from a yearly rate of approximately 5% to almost zero. Successful completion of the program appears to have lasting effects in terms of far lower rates of DWI recidivism, even 2.5 years later. The effects on DWI recidivism are paralleled by reduced rates of traffic accidents involving injuries.

Hard suspension seems almost to have an adverse effect on DWI recidivism, but crashes resulting in injuries may be reduced during revocation.
Background

In Sweden, as in many other countries, drinking drivers represent perhaps the biggest problem in road traffic safety. As the risk of detection is very low, it can be assumed that most people convicted of drinking and driving have driven while under the influence of alcohol on many previous occasions (Rauch et al, 2002). Thus, it is likely that a DWI offence predicts more or less serious alcohol problems.

According to Swedish population surveys, 10% to 15% of all men and approximately 5% of all women are estimated to have chronic alcohol dependence, and around a quarter of these are in what can be called an “active” phase (Statens Beredning för medicinsk Utvärdering [SBU] report, 2001). However, we do not know how many and how often these people are on our roads while intoxicated. Conversely, we have found that 60% of DWI-convicted drivers can be diagnosed as alcohol dependent or alcohol abusers in accordance with DSM-IV criteria (Bjerre, 2003). In the United States, for example, the situation appears to be similar, with the diagnoses of alcohol abuse and alcohol dependence summing to 70% of people convicted of DWI (Miller and Windle, 1990). Based on this knowledge and knowing that most Swedes carefully avoid drinking and driving, we may assume that a major part of all drinking and driving occurs among a limited number of people (ie, active alcoholics). That assumption fits in very well with the results reviewed by Beirness and Simpson (2002) and Beirness et al (2002) in Canada. A survey indicated that 3% of licensed drivers accounted for 80% of all impaired-driving trips.

Evidence for the effectiveness of alcohol interlock programs has been reported in many parts of North America (Voas et al, 1999; Coben and Larkin, 1999; Beirness and Marques, 2004). Accordingly, in the past decade, alcolock programs have been adopted as part of the DWI control strategy in the United States and Canada, almost exclusively to prevent repeat DWI offences by convicted DWI offenders (for a review see Marques et al, 2001). In Sweden, too, a volunteer interlock program began in 1999 for already-convicted DWI offenders. However, this strategy of using voluntary secondary prevention was not expected to have a major impact on the overall problem of drinking and driving because too few people volunteer for the interlock. Therefore, in 1999 a primary prevention approach to prevent any kind of drinking and driving also was introduced in Sweden.

The primary prevention approach was adopted to overcome the difficult task of detecting vehicle operators with alcohol problems who are employed by various transport businesses and preventing them from drinking and driving. This primary prevention approach was first applied as a pilot project in three commercial transport companies that were given the chance to install interlock devices in their commercial vehicles (buses, trucks, and taxis). Later, alcolock installation was attempted on several more commercial vehicles.

This paper presents 5 years of experiences and results following implement-menting of both primary and secondary prevention of impaired driving.
Method

Primary prevention

The primary prevention strategy is defined as having alcocols in operation among a population of drivers who have not been monitored for alcohol problems. It does not exclude, however, the fact that some drivers in such a population could be known to have alcohol problems.

In the pilot project, about 300 devices were installed in the vehicles of three types of commercial transportation companies operating buses, trucks, and taxis. In all, about 800 drivers were employed in these transport companies and were thus obliged to use the alcocolk each time they started the vehicle. The alcocolk device installed in all the vehicles was manufactured by Lifesafer. However, due to technical problems in buses and trucks, the Lifesafer device was exchanged for the Guardian WR2 device after a short period. In addition to this pilot project, about 2700 more alcocols were installed in different kinds of commercial vehicles, including school buses, at a later stage. However, data from these companies were not available.

Process evaluation. In the pilot project, three polls were conducted, focusing on the evaluation of attitudes toward the alcocolk. Questionnaires were addressed to the drivers as well as to the employers, customers, and passengers. The first evaluation was made during the installation phase in spring 2000, the second in summer 2001, and the third at the end of 2002.

Outcome evaluation. The outcome evaluation was conducted by studying the log data recorded from the ignition interlock devices installed in the vehicles. This evaluation was, however, not possible to perform in the pilot project but was made in another population of 538 different vehicles. The number of breath tests at start and the number of positive breath tests (BAC>.02%) were recorded. Also the number of tests showing BAC>.10% was identified.

Secondary prevention

The secondary prevention strategy refers to the use of a comprehensive interlock and medical monitoring program after a DWI offence. In this context, it refers to the volunteer program that has been underway in Sweden since 1999 (for further details, see Bjerre, 2003). This program covers 2 years and involves strict regulations entailing regular medical checkups. It focuses strongly on changes in alcohol habits; consequently, individuals with continually high alcohol consumption are not permitted to remain in the program.

The alcohol ignition interlock program was launched as a pilot project in 3 of 21 counties in Sweden. In October 2003, the program was expanded to cover the entire country and now includes passenger cars, as well as trucks, buses, and taxis.
Two control groups were used to evaluate the results. One consisted of DWI offenders who had chosen not to participate in the program and who therefore had their driver’s licenses revoked (group K2). The other consisted of individuals matched from counties that were not taking part in the program (group K1). In other words, K1 consisted of DWI offenders who would have taken part in an interlock program had they been offered the opportunity. (The recruitment for control group K1 ended in September 2003, as the interlock program was expanded to cover the entire country.)

**Process evaluation/assessments.** This involved longitudinal monitoring of interlock users, with the main focus on any changes in lifestyle and drinking behavior. These changes were determined through alcohol use questionnaires as well as through five biological markers: the three liver enzymes GGT (gamma glutamyl transferase), AST (aspartate aminotransferase), and ALT (alanine aminotransferase), the mean volume of red blood corpuscles (MCV) and carbohydrate-deficient transferrin (CDT). We also present the results from the alcohol problems survey determined through the alcohol-problem screening questionnaire AUDIT (Alcohol Use Disorders Inventory).

Group K1, the matched controls, could be assessed only by the AUDIT, and not the biological markers. No assessments were possible for group K2.

**Outcome evaluation.** Outcome data were derived from official accident statistics (road accidents involving injury per police reports), the number of DWI offenses, hospital discharge registers, and sick leave registers. Data were collected covering the 5 years before the DWI offence and onwards. In this paper, sick leave data are not presented. The hospital discharge registers presented here only include statistics of traffic accidents leading to hospitalization. The chi-square test was used for statistical analysis of the differences between the groups being studied.

**Results**

**Primary prevention**

**Process evaluation.** In the pilot project, the first poll was conducted while the alclocks were still installed on the vehicles of the three companies. This poll mainly reflected expectations of the interlock devices.

Several drivers reported that suspicion automatically was thrown on them because they had to blow into the alclock before they could start the vehicle. The drivers also expressed that they expected an increased workload and disturbances in their daily work. Conversely, the drivers as well as the employers and passengers considered it important to secure safe transport by using alclocks.

The second poll was conducted when most vehicles had had the interlock device installed for a year and a half. At that time, three of four drivers found that the interlock device had no negative impact on their
professional role. Moreover, the confidence in alcotlocks also had increased among the employers and passengers who were asked.

At the time of the third poll, most of the vehicles had had the alcotlock installed for 3 years. At that time, most of the drivers viewed the device as a natural part of their driving routine despite the fact that about half of them had experienced technical problems with the interlock device. The group of taxi and bus passengers was most positive about the use of alcotlocks. Among the employers, three of four were of the opinion that alcotlocks should gradually become standard equipment in the vehicles. They also believed that the reputation of the company had improved by using alcotlocks in their vehicles.

**Outcome evaluation**. Positive breath tests (BAC > .02%) were recorded in each of the 3000 vehicles with alcotlocks. The information about such positive tests, however, is sensitive for commercial as well as individual reasons. Therefore, we can only publish the results from those 538 vehicles where the monitoring program is served by the alcotlock supplier. These vehicles represent taxis, trucks, buses, and passenger cars. The commercial companies had their own alcotlock service.

In all, 848 positive breath tests were recorded among the 251,580 starts that were monitored during 2003. This means that 99.66% of all BAC tests were lower than .02%. But this also means that 3.3 of 1000 trips would have been drink-driving trips if they had not been stopped by the alcotlock. Moreover 4 of 10,000 trips would have been performed with a BAC > .10%. The rate of BAC tests > .02% in this Swedish primary prevention program can be compared to data reported by Marques et al (2003). They found that 99.43% of 18 million interlock BAC tests taken by 7300 DWI offenders in Quebec were lower than .02%. It is very interesting to find that the elevated rate of 3.3 per 1000 tests in our Swedish primary prevention program is somewhat lower than the rate of 5.7 elevated tests per 1000 in a sample of convicted DWI offenders. This difference is 72% lower for the primary prevention program, but the absolute differences seem smaller than we might have thought.

If the rate of tests > .02% is regarded as a background rate of alcohol-affected driving, it is important to understand how the employers interpret and deal with the positive breath tests. Some of the companies have found that positive breath tests do not occur merely at random but, in some cases, repeatedly among a small number of their employees, suggesting the presence of alcohol problems. In a few cases, recently employed drivers decided to quit when confronted with the positive breath test recorded. In other cases, when it has been revealed that an employee has alcohol problems, the employer has offered adequate treatment.

**Secondary prevention**

During the period under evaluation, 836 people had voluntarily applied to participate in the interlock program (as of August 2004). About 5% of the applicants had been rejected due to other medical problems, which was
often simultaneous abuse of other drugs. In all, only 11% of the eligible DWI offenders have taken part in the program.

**Process evaluation.** Here, we focused on changes in alcohol habits, and in this context, the main interest was changes detected with the biological markers of alcohol during the first 12 months in the program. These were studied because the participants had to demonstrate a sober lifestyle from 12 months in the program onwards. To demonstrate that the biological markers had to show normal levels, provided the increased level of the markers could not be explained by factors other than alcohol consumption. Otherwise, the participants were dismissed from the program.

As shown in Figure 1, the number of participants with increased levels of the alcohol markers MCV, GGT, and CDT dropped noticeably from the first day of applying for participation in the program until their checkup after 3 months. The crucial assessment after 12 months was preceded by another drop. A more pronounced decrease was found regarding the number of participants reporting dangerous or harmful alcohol habits as measured by the AUDIT. At the start, the AUDIT scores indicated that 68% of all participants had dangerous or harmful alcohol habits, but only 14% self-reported this after 12 months in the program (Table 1). This self-reported reduction of alcohol consumption, however, was not paralleled by the biological markers of alcohol as 35% of the participants still had at least 1 of the 5 alcohol biomarkers higher than the reference level after 12 months.

![Figure 1. Percentage of interlock users with elevated GGT, CDT, and MCV values at each of the medical checkups during the first 12 months in the program.](image-url)
Table 1. Percentage of interlock users who have signs of harmful alcohol consumption (AUDIT scores >8 for men and >6 for women) or any of the five biological alcohol markers above the reference range during the first 12 months in the program.

<table>
<thead>
<tr>
<th>Time</th>
<th>At start</th>
<th>3 months</th>
<th>6 months</th>
<th>9 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUDIT</td>
<td>68%</td>
<td>46%</td>
<td>36%</td>
<td>23%</td>
<td>14%</td>
</tr>
<tr>
<td>Biological marker above reference</td>
<td>49%</td>
<td>34%</td>
<td>35%</td>
<td>39%</td>
<td>35%</td>
</tr>
</tbody>
</table>

In Figure 2, a comparison of the AUDIT data is made between the interlock participants and the control group K1. One year after having completed the 2-year program, the mean AUDIT scores remained at a low level among the participants. According to the AUDIT scores, the DWI offenders in the matched group of controls (K1) also reported improved alcohol habits, although they had higher mean scores than the alcoclock participants and were 3 years from the DWI offence. For these controls, no data are available to show the levels of biological alcohol markers.

![Graph](image)  

Figure 2. The mean AUDIT scores of the interlock users and the controls in group K1. The survey of alcohol problems through AUDIT was performed at start in the interlock program and at the revocation of the driver’s license (K1), after 1 year of program or revocation, and finally 1 year after having completed the program or 3 years after revocation. Three years after the DWI offence, several of the control subjects were relicensed.

**Outcome evaluation**

*DWI recidivism.* We have reliable data showing significantly reduced alcohol consumption among the interlock users during the program period, but the key question is whether this had any positive impact on road safety. Our data suggest this is likely to be the case considering the impressive effect of the program on DWI recidivism.

We describe the interlock users in three subgroups: those participants who are still in the program (*ongoing*), those who have completed the 2-year program, and those who have been *dismissed* from the program. As
shown in Table 2, the annual frequency of DWI offences was reduced from the prior 4.2 to 6.1% per year to almost zero while still participating in the program. Thus, there was a highly significant difference ($p<0.001$) for all interlock users between the annual rate of DWI offences before and during the program. This is in impressive contrast to what was found among those whose driver’s licenses had been revoked in the same counties (K2), as well as among the matching controls in other counties (K1) despite their self-reported reduction in AUDIT scores. In those groups, the annual rate of DWI recidivism was not reduced, but rather raised by revoking the driver’s licenses, which also indicates a very high degree of illegal driving. Among the controls, there was no statistically significant difference between the three periods: prior to the DWI offence, during the revocation, or after being relicensed. A similar result was observed among those participants who were dismissed from the interlock program (ie, the annual rate of DWI offences was raised soon after the dismissal). Conversely, those individuals who had completed the program still had a reduced annual frequency of offences ($p<0.01$) when monitored up to 2.5 years later (with a mean of 1.3 year). This annual rate does not differ, however, from that of the controls being relicensed.

**Table 2.** Frequency (percentage) of DWI offences per year. For interlock users, 5 years before the present DWI offence, during and after the interlock program. For controls, 5 years before the DWI offence, during the revocation and the period after being relicensed.

<table>
<thead>
<tr>
<th></th>
<th>Interlock Users</th>
<th>Controls</th>
<th>All of Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ongoing N=442</td>
<td>Completed N=171</td>
<td>Dismissed N=222</td>
</tr>
<tr>
<td>Five years prior:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Number of incidents</td>
<td>87</td>
<td>52</td>
<td>54</td>
</tr>
<tr>
<td>• Annual frequency (percentage)</td>
<td>4.2</td>
<td>6.1</td>
<td>4.9</td>
</tr>
<tr>
<td>During the program/revocation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Number of incidents</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>• Annual frequency (percentage)</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>After the program/after being relicensed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Number of incidents</td>
<td>—</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>• Annual frequency (percentage)</td>
<td>—</td>
<td>1.8</td>
<td>4.3</td>
</tr>
</tbody>
</table>

The annual rate of DWI offences before the studied offence is significantly higher among those participating in the interlock program than among those who did not (control group K2) ($p<0.001$). Conversely, there is no statistically significant difference in prior rates of DWI offences between interlock users and the matched controls (K1).

**Crash rates.** The low rate of DWI recidivism during the interlock program is paralleled by a reduced collision rate. As shown in Table 3, the police-reported crash rates are about five times higher among all the studied DWI offenders as compared to the average Swedish driver (5 years before the DWI offence). During the alcolock program, the annual rate of crashes...
involving injury is reduced significantly, both for those who complete the program \((p<0.001)\) and for those who are dismissed \((p<0.01)\). Both groups of controls show reduced rates of police-reported crashes during revocation \((p<0.001)\), even though the DWI recidivism was unchanged during this period.

Table 3. Rate (percentage) of road crashes involving injury per police reports. For interlock users, 5 years before the present DWI offence, during and after the interlock program. For controls, 5 years before the DWI offence, during the revocation, and the period after being relicensed.

<table>
<thead>
<tr>
<th></th>
<th>Interlock Users</th>
<th>Controls</th>
<th>All of Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ongoing N=470</td>
<td>Completed N=169</td>
<td>Dismissed N=221</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group K1 N=865</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group K2 N=3 065</td>
</tr>
<tr>
<td>Five years prior:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Number of incidents</td>
<td>53</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>• Annual frequency</td>
<td>2.3</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>(percentage)</td>
<td>(percentage)</td>
<td>(percentage)</td>
</tr>
<tr>
<td>During the program/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>revocation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Number of incidents</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>• Annual frequency</td>
<td>1.9</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>(percentage)</td>
<td>(percentage)</td>
<td>(percentage)</td>
</tr>
<tr>
<td>After the program/after</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>being relicensed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Number of incidents</td>
<td>—</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>• Annual frequency</td>
<td>—</td>
<td>0.9</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>(percentage)</td>
<td>(percentage)</td>
<td>(percentage)</td>
</tr>
</tbody>
</table>

When comparing crash rates among interlock users, no difference was observed between the period before the offence and after having completed the program. However, these data are uncertain considering the hitherto few police-reported accidents. For now, there is insufficient statistical power to draw any conclusions about the role of alcocolock in crash reduction. Conversely, the controls (K1 and K2) show significantly lower annual crash rates after being relicensed as compared to before the DWI offence \((p<0.001)\).

A specific analysis of the statistics on the hospitalization due to road accidents is presented in Table 4. These data strongly support those from police-reported crashes involving person injury. Thus, the interlock users and the matched controls had an annual rate of hospital admission about five times higher than that of the average Swede during the 5 years before the assessment. Even though the data are still few, the preliminary findings suggest that during participation in the interlock program, but not during revocation, there is a reduced rate of hospitalization after traffic accidents. The hospital data also suggest a prior difference between those participants who successfully complete the program and those who do not. That suggestion is supported by data covering all kinds of hospital care (irrespective of medical diagnosis). Here, we find consistently higher rates of hospital admissions among those who are dismissed from the program due to continual drinking or relapses.
Table 4. Rate (per 1000 drivers and year) of hospitalization after traffic accidents according to hospital discharge registers.

<table>
<thead>
<tr>
<th></th>
<th>Interlock Users</th>
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<th>Controls</th>
<th></th>
<th>All of Sweden</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ongoing N=470</td>
<td>Completed N=169</td>
<td>Dismissed N=221</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Five years prior:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hospital admissions</td>
<td>38</td>
<td>10</td>
<td>22</td>
<td>94</td>
<td>17 000</td>
<td></td>
</tr>
<tr>
<td>Annual rate of admissions</td>
<td>17</td>
<td>12</td>
<td>20</td>
<td>22</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Days in hospital care</td>
<td>95</td>
<td>88</td>
<td>140</td>
<td>78</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>During the program/revocation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hospital admissions</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>33</td>
<td>17 000</td>
<td></td>
</tr>
<tr>
<td>Annual rate of admissions</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>22</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Days in hospital care</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>95</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>After the program/after being relicensed:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hospital admissions</td>
<td>—</td>
<td>0</td>
<td>12</td>
<td>1</td>
<td>17 000</td>
<td></td>
</tr>
<tr>
<td>Annual rate of admissions</td>
<td>—</td>
<td>0</td>
<td>42</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Days in hospital care</td>
<td>—</td>
<td>0</td>
<td>172</td>
<td>13</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

In Sweden, drinking and driving largely predicts alcohol problems. This presumption is based on several findings. Population polls indicate that Swedes generally are very careful not to drive after having drunk alcohol. Furthermore, the low risk of detection means that the DWI offender statistically has committed drink-driving offences several times before being convicted. Different studies also have shown a very high frequency of alcohol problems among DWI offenders, irrespective of the BAC level at detection (Bergman et al, 2000). Therefore, it would be a great advantage to find the problem drinkers before they cause a crash or commit a DWI offence (i.e., to introduce a primary prevention strategy). This would be most desirable for professional drivers who use the roads more and therefore constitute a higher traffic safety risk.

The chance of identifying individuals with alcohol problems by ordinary means is low at most workplaces and probably even lower at transportation companies where employees often operate independently. The installation of alcolock devices in all the vehicles of a commercial or public transportation company would offer the possibility not only to prevent drinking and driving, but also to identify individuals who have alcohol problems. This was the idea behind initiating the pilot project reported in this paper.

As reported in this study, the installation of interlock devices in the vehicles of the first three commercial transport companies (buses, trucks, and taxis), after some initial hesitation, was eventually very well accepted by the employers and employees as a safety measure to ensure high-quality transport services. Moreover, according to the polls, the passengers in buses and taxis were the most positive about the use of alcolocks; consequently, all commercial operations that had installed alcolocks kept the devices in their vehicles. Another result of these positive experiences
is that the number of commercial transport vehicles with alcolocks installed is rapidly growing in Sweden.

In our primary prevention study, we found that, in a representative sample of 538 vehicles, 3.3 of 1000 starts were prevented by the interlock device after a BAC level exceeding the legal limit of >.02% (20 mg/dl) had been measured. This rate of 0.33% drink-driving attempts was surprisingly high for the primary prevention study, as we had expected a preventive effect because the participants knew the alcolock was installed. Although probably an underestimate, this figure does give some idea of the prevalence of drinking and driving on Swedish roads. Unfortunately, we have no recent Swedish data for a comparison. However, in 1996, the prevalence was estimated at 0.19%.\(^1\) That estimate was based on roadside breath tests performed by police officers through random controls insofar as was possible.

We also observed that 4 of 10 000 starts were prevented after breath tests showing a BAC level >0.10%. That would correspond to a prevalence of at least 0.04% of gross drinking and driving on the roads in Sweden. In comparison, the 1996 US national roadside survey (Zador et al, 2000) showed that 16.5% of the nighttime weekend drivers had BAC levels higher than zero, whereas an equivalent of 0.7% of the drivers had a BAC of 0.15 or higher. Keall et al (2004) found in a New Zealand roadside survey that 0.4% of the drivers on the road had BAC levels higher than 0.155. Nonetheless, the Swedish primary prevention rates of high BAC can be compared to the Quebec interlock results of Marques.\(^2\) He found that of 7300 DUI (driving-under-the-influence) offenders using an interlock, 5.2 per 10 000 were start attempts with a BAC of .08% or higher. These Canadian rates for offenders are not very different from the rates found among the Swedish primary prevention sample. The differences between interlock and the roadside surveys may reflect differences in methodology and the more restricted time of day that the roadside surveys are conducted.

Our data indicate that about 4700 drink-driving attempts that occur per year have been prevented by the alcolocks installed voluntarily in the 3000 commercial vehicles. In this context, the several difficulties in recording data from the operators that voluntarily use alcolocks in their vehicles are notable. The most important and at the same time understandable reason is the lack of interest from commercial transportation operators to publish such data. This is because from a legal point of view, any positive breath test showing a BAC higher than the legal limit of .02% reveals a DWI offence that could have occurred had the alcolock not prevented it. This is a major concern for the employers who have been forced to develop an alcohol policy to deal with drinking drivers. According to such policy documents, employers now routinely use warnings after the first BAC-positive breath test and suggest treatment in case of repeated positive tests.

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Due to the secrecy problems mentioned, we are unable to present data demonstrating the effects of the primary prevention strategy on crash rates. Nevertheless, by personal communication, we know that some transportation operators have observed less damage to their vehicles after the installation of alcolocks.

The **secondary prevention strategy** presented in this paper refers to voluntary participation in an interlock program following a DWI offence. In contrast to the primary prevention approach where an alcolock device is simply installed in the vehicle to prevent starting when BAC is higher than .02%, the secondary prevention involves a strict program including regular medical checkups. The strict regulations are aimed at changing previous drink-driving habits and reducing alcohol consumption.

Our data have clearly demonstrated that DWI offenders are generally in a high-risk category long before their offence (Bjerre, 2003). Thus, we observed a four to five times higher crash rate for DWI offenders than for the average driver. Moreover, we found that 60% of the DWI participants in the program could be diagnosed as alcohol dependent or alcohol abusers. Consequently, it is not surprising that 68% of the participants at the start of the interlock program self-reported dangerous or harmful alcohol habits through the AUDIT questionnaire. The self-reported data also fits well with the finding of increased levels of at least one of the five measured biological alcohol markers among 48% of the participants at the start.

After 12 months in the program, only 14% still self-reported elevated AUDIT scores associated with harmful alcohol habits. The more objective measure of alcohol consumption—the level of the different biological markers—confirmed the general decrease in consumption during the first 12 months in the program. However, 35% of the participants still had at least one biological marker with an increased level after 12 months.

In keeping with this finding, more than 40% of the participants could not cope with the strict regulations of the 2-year program and therefore were dismissed due to continual drinking or relapses (Bjerre, 2003). We observed that those individuals who chose to participate in the interlock program had a significantly higher, prior annual rate of DWI offences than those who did not participate in the program. This observation may be explained by the fact that in the former group, we find drivers using their cars more frequently and therefore being more exposed to supervision by the police. In any case, during the alcolock program, we can clearly demonstrate significantly reduced alcohol consumption. The rate of recidivism for DWI offenders is dramatically reduced from a previous yearly rate of about 5% down to almost zero while still in the program. Most encouraging is the finding that a successful completion of the 2-year interlock program seems to have lasting effects reflected by a markedly reduced rate of DWI recidivism even 2.5 years after the end of the program. The reduction in alcohol consumption and DWI recidivism also leads to reduced crash rates during the interlock program. There are still too few patients to evaluate whether there will be lasting effects after the program.
Another picture was observed among the controls. During the period of revocation (1 or 2 years), the annual rate of DWI recidivism was not changed as compared to the rate 5 years before revocation began. That finding does not fit very well with the self-reported improvement of alcohol habits by way of the AUDIT scores for the control group K1 when evaluated 1 and 3 years after the DWI offence. These controls, relicensed after a medical examination, still shows about the same rate of DWI recidivism as found before the offence and during the revocation. Conversely, the crash and injury rates (according to police reports) were reduced during the period of revocation as well as after being relicensed. These discrepancies are not easily explained but may suggest the adoption of more careful driving habits as others have reported, even though overall alcohol use is unchanged. However, it also could reflect an underreporting to the police as the rate of hospitalization after traffic accidents is unchanged at least during revocation.

Although the results of the secondary prevention strategy are impressive, the number of volunteer participants is small. Thus, the impact of this measure on the entire problem of drinking and driving will be limited. Conversely, it may be argued that the primary prevention strategy is overestimated in the sense that according to our data, 997 of 1000 breath tests at start were unnecessary because the driver’s BAC was lower than .02%. Perhaps another more efficient way to accomplish prevention would be to identify individuals who have an alcohol problem and require the use of alcolocks to prevent them from drinking and driving. Several of these individuals, especially those with advanced alcohol problems and alcohol-related diseases, are treated in the healthcare system. This system might agree to identify the individuals who need alcolocks. In Sweden, the Driver’s License Act states that doctors are obliged to report to the licensing authority patients who, for medical reasons, are clearly unfit to hold a driver’s license. Alcohol dependency or abuse constitutes a medical reason for reporting if sobriety has not been verified (Swedish Road Administration, 1996). According to a recent poll (Bjerre et al, 2004a, 2004b), Swedish doctors would report a substantially greater number of alcoholics than at present if there were an opportunity for the patient to participate in a 2-year alcohol ignition interlock program as an alternative to license revocation. Based on these findings, another prevention strategy will soon be introduced in Sweden: permitting doctors to report patients to the licensing authority for participation in an alcolock program. This targeted prevention approach also might be regarded as a primary prevention strategy as the alcoholics identified by the doctors have not (yet) been detected as drinking drivers.

With the use of alcolock devices and alcolock programs through the three strategies presented in this paper, we are likely to increase the public’s acceptance for more general use of alcolocks in Sweden. The Swedish government has already presented two goals for alcolocks: installation in all buses and trucks by 2010 at the latest and installation in all new cars by 2012. Thus, we seem to be making good progress with a broad approach towards the prevention of drinking and driving on our roads by using alcolock devices and alcolock programs.
References


Interlock BAC Tests, Alcohol Biomarkers, and Motivational Interviewing: Methods for Detecting and Changing High-Risk Offenders

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Pacific Institute for Research and Evaluation, Calverton, Maryland, USA

Introduction: The Sorting Problem

There has been ample evidence from the primary literature and from summary reviews that alcohol interlock programs reduce DUI (driving-under-the-influence) offenses (Beirness and Marques, 2004; Voas et al, 1999; Coben and Larkin, 1999; Beck et al, 1999; Marques et al, 2001a). Research also has shown that if a whole county implements an ignition interlock program, such as has been done in Hancock County, Indiana, it can reduce the overall rate of repeat offense convictions for the county, not just for those few with interlocks. These outcomes occur when interlock programs are required by the court, and then monitored and enforced (Voas et al, 2002). High rates of court-ordered interlock use are not restricted to suburban/rural Hancock County. In mixed urban/rural Santa Fe County, New Mexico, a 63% installation rate was achieved by three of the four magistrate court judges between January 2003 and September 2004, which significantly reduced overall Santa Fe County recidivism relative to the state.³

There remains concern among a minority of people that those who install alcohol interlocks are lower risk or not fully comparable to offenders who do not install interlocks; however, few continue to view this as a serious problem. We have had repeated demonstration that interlock offenders have future DUI offenses rates similar to noninterlock comparison groups after interlocks are removed (Beirness and Marques, 2004; Voas et al, 1999; Beck et al, 1999; Tippetts and Voas, 1997). Interlock programs work well as long as the interlocks are enforcing compliance, but after the interlock is removed and the driver’s license is restored, the differences between interlock users and noninterlock users are substantially reduced or disappear entirely.

On the other hand, alcohol ignition interlock programs will not adequately solve the public health and safety problem of impaired driving as long as interlock programs are brief and remain separate from efforts to resolve alcohol abuse and dependency problems. Each DUI conviction is an opportunity to reduce public risk exposure; DUI drivers are by definition a public hazard. Punishment by itself is not a very effective means of changing behavior. Accordingly, to make a lasting impact, we should build better links between enforcement and community treatment programs to help advance common goals. Those goals should be improving individual health and public health while reducing both public and individual risks related to alcohol.

³ Roth, personal communication, February 2005
Alcohol treatment clients and alcohol offenders overlap somewhat, and more effort is warranted to integrate methods of intervention and assessment. Not all DUI offenders are alcohol dependent and not all dependent alcohol treatment clients are impaired drivers, but by almost any practical definition, they both have alcohol problems. The definition of alcohol dependence is well established. Both major diagnostic systems—the Diagnostic and Statistical Manual Fourth Edition (DSM-IV) and the Tenth International Classification of Diseases (ICD-10)—show excellent concordance on the definition of alcohol dependence, whereas the definitions of alcohol abuse (DSM-IV) and harmful use (ICD-10) show less agreement (Grant, 1996). The major portion of a treatment sample will meet the criteria for dependence. In our own evaluation of alcohol treatment service delivery in eastern Pennsylvania, we found that by diagnoses from both clinician assessment or patient assessment using the Substance Abuse Outcomes Module, more than 90% of the 963 patients who entered alcohol treatment met the criteria for alcohol dependence, but only 25% reported prior DUI convictions (Marques et al, 2003c). But what proportion of convicted DUI offenders meets the criteria for alcohol dependence? Lapham et al (2004) cautioned us to be aware of underreporting alcohol dependence symptoms in DUI samples. They reported that as few as 20% acknowledged symptoms of dependence upon intake in usual offender assessments. By contrast, Helzer et al (1985), using lengthy structured interviews to arrive at DSM diagnoses, identified 82% of male DUI offenders as dependent. However, most screening opportunities with DUI offenders are short and do not allow for in-depth questions or the development of the rapport needed for structured interviews. Bjerre (2003), who has conducted extensive medical evaluations of alcohol offenders, reported that 70% of convicted DUI offenders in Sweden meet the criteria for alcohol dependence. Our own 2005 evidence from 243 interlock-using DUI offenders in Alberta who sat for the Alcohol Module interview of the Computer Diagnostic Interview Schedule (DIS-C) determined that 47% of the sample met criteria for dependence.

If the true proportion of offenders who are alcohol dependent is near or exceeds 50%, then we are attracting half or fewer into treatment. In a study sample of 166 interlock-using DUI offenders in Texas, we found the proportion who reported having received alcohol-counseling services in the past to be low. Just 20% of this group of offenders had prior outpatient alcohol treatment, and 5% received prior residential alcohol treatment services.

Although the treatment and offender populations probably do have more in common than surveys reveal, it would be naive to assume that they are identical, have the same interest in cooperating with intake assessments, or that there is a common form of alcohol treatment service that will be right for all. Those who may need treatment services differ on many dimensions, and one factor is often readiness for self-change or motivation for treatment. Motivational Interviewing (Miller and Rollnick, 2002) is an approach to therapy that is client-centered: it engages clients to resolve ambivalence and form their own views about the value and the approach that should be taken toward personal change. A variant of this approach was used with the interlock-using DUI offenders in Texas, and they self-
reported that this nondirective motivational enhancement approach was quite acceptable (Timken and Marques, 2001; Marques et al, 2004) and, for most, highly valued. Project MATCH Research Group (1997) determined that nondirective motivational approaches are well suited for difficult-to-change populations.

There is a roughly accurate and convenient rule of thumb that has emerged from alcohol treatment intervention studies that could be called the “one-third” rule. That is, in most alcohol or drug treatment intervention studies, approximately one-third of the sample will remain abstinent for up to 12 months, one-third will have resumed dependent or abusive use, and one-third will be in the gray zone between the two. Programs that achieve success in excess of those rates, such as Project MATCH, are the exception. Such manual-based interventions are usually done by extremely skilled clinicians operating from explicit treatment protocols for the purposes of research. These are costly services delivered to only uncomplicated alcohol patients having no drug or mental health comorbidities and can be expected to differ from the ordinary services most widely available.

Because most behavioral interventions will not end problem drinking in half to two-thirds of all treated alcohol abusers, and knowing that even effective safety interventions such as the alcohol ignition interlock only temporarily reduce risk, what criteria are available by which we can classify DUI offenders to scale their enduring risk to the public? As we attempt to address this practical problem, we should consider three aspects of it. What are the characteristics of those who will not change despite our best efforts to help them? Then having classified someone as posing a higher degree of risk, what should we do about them? That is: (1) Who will change? (2) Who will not change? (3) How do we tell the difference?

This question may sound slightly familiar since it is a rewording of the “Serenity Prayer,” a ditty commonly heard in Alcoholics Anonymous and other mutual support/self-help programs. In its original form, the Serenity Prayer usually asks for “the serenity to accept the things I cannot change, the courage to change the things I can change, and the wisdom to know the difference.” Those of us interested in public safety use a functionally similar mantra to guide our work: we need the data to detect the offenders who will not change, the resources to help change the ones that are able to change, and evidence to know the difference. It probably is worthwhile to add a line: “...and the good luck to live in an area where the courts are willing to act on this information.” This last line is warranted because the courts, due to their low usage of interlocks in sentencing decisions, are now probably the single major barrier to controlling impaired driving with interlock programs.

The larger point here is that these pleadings for behavior change address similar problems whether viewed from the frame of the individual or of society. But we do not want to just accept that there will be some people who cannot change, we want to know who they are so society can impose constraints on their choices to assure that the rest of us do not
have to share their personal risk. We also want to do what is possible to help those who can find the motivation to make the necessary changes.

Most DUI offenders could benefit from some type of change in their drinking behavior, whatever their diagnostic category of alcohol use disorder. Without good documentation to scale driver risk and a solid effort to stimulate change, we will lack the wisdom to know the difference; that is, to know which ones are just not taking serious steps toward self-change. These are the DUI offenders who pose too much of a public risk to warrant restoration of their full unrestricted driving privileges.

If we can agree that re-granting of a driver license after an interlock program should be a decision based on scientific evidence of risk, then what should that evidence be?

**Detecting the Offenders’ Risk Evidence**

The period of interlock-restricted driving is an excellent opportunity to monitor a driver’s compliance with the expectations of a behavior change program because each month the record of hundreds of breath tests can be reviewed and discussed. If the interlock was ordered by a court, the courts can play an important role in assuring that all the assessment opportunities during the regular visits to the interlock service program are used to full advantage. One day this may involve having a counseling component integral to the interlock program for the monitoring and assessment of offenders.

Routine self-report assessments have been part of alcohol intervention services for many years, but newer, more objective methods for scaling driver risk are now available that could be exploited. The need for better methods is evident from Lapham et al (2004) who have documented a high degree of underreporting of diagnosable alcohol-related problems by DUI offenders. The motives for truthful disclosure by the court-sanctioned population are different from the motives of the treatment population. Self-report assessments proven to be valid and reliable with alcohol treatment samples have a more difficult task when it comes to court-ordered or government-sanctioned DUI offenders. The difference is self-interest. Non-DUI treatment clients are more apt to be motivated by self-interest or family interests to honestly disclose drug or alcohol use. DUI offender populations probably have more in common with illicit drug offenders as both may want to underreport usage to avoid further sanctions.

Many researchers have shown that use of self-report to estimate illicit drug involvement is often flawed both with criminal justice populations (Mieczkowski and Newel, 1999), as well as drug abuse treatment populations (Wish et al, 1997; Marques et al, 1993; Kline et al, 1997). The discrepancies have come to light with concurrent measurement of biological samples and self-report. Hair or urine test results have shown there to be a high degree of underreporting in both populations. To evaluate the extent of this problem, the US National Institute on Drug Abuse (NIDA) devoted an entire 1997 research monograph to the issue of self-report validity (NIDA, 1997). When working with assessment in a criminal justice
sample, the accuracy of self-report is often a weak link in the chain of documentation because the motivation for self-disclosure is low when the court requires an intervention. Most offenders will not see honest disclosure as in their self-interest. But unlike self-report assessments or interviews, technological approaches are not dependent on the veracity of self-report.

As a result of the low reliability of self-report together with the high cost and limited value of jail as a solution, there is a growing interest in a community corrections approach that involves the technical monitoring of offenders in their homes or while on the job. Traditionally, this has involved calling in offenders for breath and urine tests or making surprise visits to the offender’s home. Recently new technologies have been developed that permit frequent remote monitoring of alcohol-involved criminal offenders (Voas and Marques, 2004). Although some of these are focused on monitoring the location of the offender (Conway, 2001), at least three electronic systems have been developed that can provide regular remote alcohol monitoring: the ignition interlock, house arrest systems like the “Sobrietor” that require telephone-linked BAC testing, and the transdermal alcohol monitoring systems (Swift et al, 1992; Swift, 2003) that can monitor alcohol vapor that emanates through the skin surface following drinking.

Combining multiple types of technically gathered information can aid in more refined detection of circumvention efforts. The most developed technical monitoring approaches to alcohol consumption monitoring that require no reliance on self-report are (1) the breath-test data from the ignition interlock device and (2) biological specimen data from the offender’s breath, blood, serum, urine, or hair.

**Behavioral evidence from the interlock record**

The concept of collecting “unobtrusive measures” was born 40 years ago with publication of a book by Eugene Webb, Donald T. Campbell, Richard D. Schwartz, and Lee Sechrest titled *Unobtrusive Measures: Nonreactive Research in the Social Sciences* (1966). It alerted researchers to uncommon, often overlooked sources of data for measuring behavior. A nice feature of such measures is that the data are created as life is unfolding rather than the usual situation in which events stop while an interviewer or questionnaire requires someone to recount the past. Unobtrusive measures do not depend upon subject recall and a motivation for truth telling. These methods use data that are independent of a subject’s motivation for honesty. The alcohol ignition interlock device logs driver BAC (blood alcohol concentration) test data with a median 6 to 9 tests per day. The interlock is used so frequently that the BAC monitoring aspect of it unobtrusively fades into the background.

We have shown that the rate of elevated interlock BAC tests strongly predicts the likelihood of future impaired-driving convictions during the years after the interlock is removed. We first documented this in Alberta from data of 2200 offenders who provided 5.5 million BAC tests (Marques et al, 2001b) and subsequently confirmed in Quebec with 7200 offenders
based on 18.8 million breath tests (Marques et al, 2003c). Figure 1 shows the 24-month post-interlock re-conviction rate plotted against 10 groups (each with approximately 720 offenders) who differed on the rate of interlock BAC tests elevated higher than .02%.

As shown in Figure 1, within 24 months after relicensing, there is an approximately tenfold higher rate of repeat DUI offenses by those in the tenth decile compared to those in the first decile. That is, these offenders behaviorally “told us” that they would be high-risk drivers long before the interlock was removed and they received unrestricted licenses. An evaluation of the potency of this effect relative to other known predictors of repeat offending has found it to be the best advance indicator yet identified (Marques et al, 2003a, 2003b), better than prior DWI (driving-while-intoxicated) offenses, moving violations, and DWS (driving-while-suspended) charges, and vastly better than demographic and questionnaire-based information. An indicator like this has particular merit for first-time DUI offenders on whom there is often little advance indication of whether an individual will pose a public hazard if he or she receives an unrestricted license. The interlock record is the type of unobtrusive behavioral indicator that will help predict which offenders may be unsafe without the restraining effect of the alcohol interlock.

Another indicator from the interlock record that we have shown to be predictive of future DUI is the proportion of elevated BAC tests that occur in the morning. Analyses of data from three jurisdictions that are widely different attest to the predictable patterns in the timing and risk evidence contained in the interlock record. Data from Texas, Alberta, and Quebec, three linguistically and culturally distinctive areas of North America, are shown in Figure 2, which portrays the timing of BAC tests on the working weekdays Monday to Friday when people’s routines are most schedule-
bound. The hour of the day with the most total tests taken is late afternoon (solid lines in Figure 2), but the hours with most tests elevated ≥.02% is in the 7 to 8 AM interval (dashed lines). These elevated tests reflect the unmetabolized ethanol from a prior night of drinking and are good examples of unobtrusive indicators that reflect level of drinking. For example, a BAC elevated higher than .02% at 8 AM would require a BAC of more than .16% at midnight for an average size male. When modeling predictors’ ability to forecast future DUI recidivism, we found that by knowing which offenders logged two or more elevated BAC test results during the morning hours, we strengthen the predictive model by an additional 45%, even after accounting for all other factors including prior DUI and overall rate of elevated BAC tests (Marques et al, 2003a, 2003b), including prior DWI status. Starting the day with an elevated BAC is a strong risk indicator even if a BAC of .02% is not itself a high risk.

![Figure 2](image_url)

**Figure 2.** Relative rates of interlock BAC tests >.02% (dashed lines) and all tests taken (solid lines) over 24-hour periods, Monday to Friday, in Quebec, Alberta, and Texas. Sampling base=38 million breath tests.

Predictive profiling that makes use of the interlock record as a partial criterion for full relicensing may come to be used by courts and motor vehicle authorities. However, sole reliance on the interlock record for evidence about future risk also would be a mistake. This is because the interlock, for all its benefits as an intervention, is still a vehicle sanction even though it is often thought of as a personal sanction. Anyone stipulated to drive an interlock-equipped car can easily drive a non-interlock-equipped car. Accordingly, full reliance on the interlock record could be misleading. In addition, if the interlock record became the sole objective criterion for relicensing decisions, it would create a further disincentive for impaired drivers to use their interlock-equipped cars.

Another source of objective evidence that can be used to supplement the interlock record is the record of past ethanol consumption.
Biological evidence from bodily specimens

The most widely used biological specimen to document ethanol consumption is BAC or BrAC (breath alcohol concentration). This is the best indicator of alcohol use because it is a 100% specificity marker that drinking has occurred, but it does not last very long. After 12 hours, in all but the most impaired drinkers, the alcohol will have cleared from circulation. However, other biological indicators reflect past drinking and do not change over time as quickly as BAC.

Biological markers of alcohol consumption differ in sensitivity, specificity, and timeframe of detection after drinking has ceased. These markers can be roughly divided into two groups based on whether they directly reflect ethanol or whether they reflect an indirect consequence of ethanol exposure. Liver enzymes, such as AST (aspartate aminotransferase) and ALT (alanine aminotransferase), are nonspecific indirect markers because they become elevated with alcoholic liver disease, as well as other liver disorders. Accordingly, these are not very sensitive indicators of recent drinking; that is, many who have been drinking will not show elevated AST or ALT. Some indirect markers, particularly MCV (mean corpuscular volume), are very insensitive; nonetheless, they continue to be studied because they can be quite specific for high levels of alcohol dependence. By the time MCVs become elevated (if they do elevate), their rise will have been preceded by other markers.

Direct alcohol markers in body fluids can often be measured for several days after drinking ceases. The primary body fluids for finding both direct and indirect markers are blood serum or urine. Some direct markers such as ethyl glucuronide (EtG) (Wurst et al, 2003) and fatty acid ethyl esters (FAEE) (Pragst et al, 2001) can be measured in serum or urine for 1 to 4 days, but these two markers also can be found in hair. This is because growing hair follicles exchange materials with the blood supply, and markers that are in transit through the blood can become sequestered and deposited in the growing hair shaft. Once a marker is in the hair, it is available for detection many months later. Considerable recent work by Friedrich Wurst and his collaborators in both Europe and the United States have determined that EtG is an excellent direct marker and can be found in urine for many days after drinking; it also can be found in hair, serum, and (presumably) saliva/oral fluid. Varga et al (1998) reported that phosphatidyl ethanol (PEth) is an excellent direct marker for drinking, even in normal drinkers, for up to 14 days. Wurst et al (2004) have reported that PEth, found in the red cell fraction of the blood, can be detected for up to 1 week. Both EtG and PEth are sensitive indicators of recent drinking. Most of the developmental work on these direct ethanol markers has come from laboratories in Sweden, Switzerland, and Germany.

Table 1 summarizes markers that can be measured, along with the specimens in which they have been found and the approximate timeframe in which elevation can be detected following cessation of drinking. The indirect markers do not usually elevate without daily exposure to ethanol. For example, carbohydrate deficient transferrin (CDT), an iron transport-
ing glycoprotein, is a marker that has been the subject of intensive investigation for several years, particularly by alcohol treatment researchers (Allen et al, 2001; Javors and Johnson, 2003). Elevation of it ordinarily requires alcohol exposure of at least five drinks daily (60 gm) for 2 weeks. CDT and GGT (gamma glutamyl transferase) have been the most widely used ethanol markers for monitoring the course of alcohol treatment. Some researchers claim that these two markers, used together, have close to 100% specificity for determining alcohol dependence levels of consumption. However, emerging nonoxidative markers are proving very exciting to the research community, and these may come into more widespread use in the near future.

TABLE 1. Alcohol Biomarkers

<table>
<thead>
<tr>
<th>Some Alcohol Markers</th>
<th>Indirect or Direct</th>
<th>Breath</th>
<th>Serum/Plasma</th>
<th>Whole Blood</th>
<th>Urine</th>
<th>Hair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alanine Aminotransferase (ALT)</td>
<td>Indirect</td>
<td></td>
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<tr>
<td>Aspartate Aminotransferase (AST)</td>
<td>Indirect</td>
<td></td>
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<tr>
<td>Gamma Glutamyltransferase (GGT)</td>
<td>Indirect</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mean Red Cell Volume (MCV)</td>
<td>Indirect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>weeks</td>
</tr>
<tr>
<td>Carbohydrate Deficient Transferrin (CDT)</td>
<td>Indirect*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>week</td>
</tr>
<tr>
<td>Sialic Acid Index of Apolipoprotein J (SIJ)</td>
<td>Indirect*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Ethanol (ETOH)</td>
<td>Direct</td>
<td>hours</td>
<td>hours</td>
<td>hours</td>
<td>hours</td>
<td></td>
</tr>
<tr>
<td>Phosphatidyl Ethanol (PEth)</td>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethyl Glucuronide (EtG)</td>
<td>Direct</td>
<td>hours</td>
<td></td>
<td>days</td>
<td>months</td>
<td></td>
</tr>
<tr>
<td>5-Hydroxytryptophol (HTOL/HIAA) ratio</td>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>days</td>
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<tr>
<td>Glucuronide conjugate of HTOL (GTOL/HIAA)</td>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
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<td>days</td>
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<tr>
<td>Whole Blood Acetaldehyde (WBAA)</td>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>week</td>
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<tr>
<td>Fatty Acid Ethyl Esters (FAEE)</td>
<td>Direct</td>
<td>hours/day</td>
<td></td>
<td></td>
<td></td>
<td>months</td>
</tr>
</tbody>
</table>

* Based on an altered structure of a target protein.

So far, alcohol biomarkers have seen virtually no use in North America as a part of the driver licensing decision making (and are infrequently used, even in alcohol treatment even though there now are physician billing codes for CDT, and GGT is quite inexpensive and routinely measured). In Europe, these markers are increasingly used as part of driver fitness decisions (Bjerre, 2003; Gilg et al, 2000). CDT and GGT can be measured in blood for a week or more after heavy drinking. Bjerre (2003) reports that CDT was elevated above normal for 16% of interlock users at the start of a medical intervention program but fell to 5% after 12 months of interlock and medical alcohol rehabilitation services. This baseline proportion of elevated DUI offenders is approximately similar to our own preliminary data from an interlock biomarker study in Alberta where 30% of interlock
offenders willing to provide blood samples showed elevated %CDT (≥ 2.6%), whereas 25% showed elevated GGT (≥ 70 IU) (Marques et al, 2005 in press). Marker elevation is not a criterion for dependence, but it does connote high levels of alcohol exposure. CDT elevation, in particular, is very specific to alcohol as are all the metabolites.

Direct ethanol metabolites found in blood, urine, or hair are generating much interest as rapid indicators of relapse in patients who are undergoing ethanol dependence treatment. But there have not yet been reports in the literature of studies evaluating the direct, nonoxidative markers as indicators of alcohol status among DUI offenders in general or interlock users in particular. Our research project underway in Alberta is studying interlock-using first and multiple DUI offenders who provide whole blood, blood serum, and hair for the measurement of markers, including PEth in blood; CDT, GGT, ALT, AST, and Apo J in serum; and FAEE in hair. Samples are being collected at the start of the interlock period and again 6 months later, after driving with an interlock. Self-report and interview instruments also are used to determine degree of alcohol involvement including the Timeline Followback, the Diagnostic Interview Schedule, the Drinker Inventory of Consequences, and the AUDIT. The outcome criterion will be future DUI offenses that are accumulated over a 2-year period following initiation of the interlock program. Some preliminary blood marker results among offenders in this program are shown in Figure 3 where log and square root normalized scatter plot of GGT and PEth values broken out by first (circles) and multiple offender (squares) status. The total variance in common between these markers is similar at an overall 30% (r squared = .3041). The diagonal regression lines portray the strength of relationship between these direct (PEth) and indirect (GGT) markers. This demonstrates no notable difference between these markers by prior offense status. In the study to date, PEth is the one marker most strongly correlated with all the others.

The major difficulty with all of these novel technological approaches to detecting driver risk or intervening to rehabilitate drivers is the importance of finding a way to do so without forcing more high-risk drivers out of compliance and into the decision that it is simply easier to drive while suspended or revoked. Without some incentive to embrace changes in drinking, driving, or both, it will be difficult to make full use of the evidence.
Changing the Offender’s Behavior

Although there are a variety of methods to counsel or motivate drivers to reduce their drinking, as noted earlier, the MATCH study (Project MATCH, 1997) determined that motivational approaches may be the most helpful among those who are most resistant to the idea of personal change. Work by Tom Nojchaski, Bill Wieczorek (Wieczorek and Nojchaski, 2004), and their collaborators have shown that as a group, DUI offenders are generally less motivated for self-change than people who enter regular alcohol treatment services. Our own work has evaluated a motivational program built around the alcohol ignition interlock in a loosely structured form in Alberta (Marques et al, 1999, 2000) and later as a tightly structured program in Texas (Marques et al, 2004). The purpose of these interventions has been to help DUI offenders enhance their awareness of the self-interest benefits that can follow from adhering to plans that separate drinking and driving with the purpose of reducing public risk after interlock removal. That is, the programs attempt to build the motivation to stick with whatever life adjustments were made by the offenders to accommodate to the interlock devices.

The behavior theory underlying the intervention models studied in these interlock-linked programs is developed around personal change readiness and motivational enhancement theory. The former is usually associated with the research of Prochaska, DiClemente, and collaborators (Prochaska and DiClemente, 1984; Prochaska et al, 1992), whereas the latter is
associated with the work of Miller, Rollnick, and collaborators (Miller and Rollnick, 1991; Bien et al, 1993; Miller and Sanchez, 1993; Miller and Rollnick, 2002). A combination of these approaches arises from evidence that personal change proceeds along a somewhat predictable readiness-to-change sequence. Until someone accepts that an effort to change has some personal benefit, the person usually will not bother to try. Wieczorek et al (1997) reported that motivational approaches are effective with the DUI populations and that among DUI offenders, many have not thought much about personal change.

The preliminary results of our Texas interlock program has shown that participants in the SIP (Support for Interlock Planning) program report improvement in most scales that describe drinking levels and problems, whether by assessments that screen for alcohol problems (AUDIT) or by in-depth evaluations of the adverse consequences of drinking (DrInC [Drinker Inventory of Consequences]). More subjects showed higher stages of readiness for change in the post-intervention period than in the pre-intervention period. The following charts summarize these effects for a preliminary evaluation based on 196 clients. Figure 4 shows pre-SIP and post-SIP AUDIT scores ($p<.0001$) broken out separately for males and females. Figure 5 shows pre- and post-DrInC scores across the five subscales (all $p<.0001$). Between the pre-SIP assessment and the post-SIP assessment, many more people appear to have moved into the “Action” stage of change.
As a group, it is evident that at least by relying on self-report, the SIP program appears to be quite effective. Unfortunately, we know that self-report is not necessarily a reliable way to establish drinking levels and problems. In several months, information will be available and that will allow us to attach interlock behavioral records of BAC tests to compare the testimony derived from questionnaire assessments.

**Summing Up: Distinguishing the Problem Drivers from the Reformed Drivers**

In this report, we have discussed the problem of how to estimate the risk of continued drinking and driving by using a combination of behavioral (interlock record) and biological marker data. The interlock data are from a vehicle that we think (but may not know) is being driven by the DUI offender of interest, and although definitely from the offender, the bodily specimens are not foolproof either. The ability to triangulate in on problem-level drinking using evidence from both sources offers a better chance to establish a relationship between those predictors and real world risk of impaired driving. The joint presence of vehicle nonuse or high rates of BAC test violations, together with elevated marker data, almost certainly means we should impose further or continuing controls on an individual. We are still several years away from having the outcome evidence from our ongoing study in Alberta that can confirm that assumption. Time will tell if our assumptions are borne out.

Just because offenders continue to drink while under an interlock sanction does not mean that they are unable to change their drinking with the right combination of sanctions and assistance. With a treatment or counseling intervention that helps offenders find the motivation for self-change, together with monitoring and behavior-linked sanctions, change can occur for some. In the United States, at least the helping and sanctioning functions of society have different traditions and do not always work together in an optimal way. Until such time when there is a more
seamless integration that can simultaneously punish and help the offender while protecting society, interlock programs can serve an important protective function by shielding the public from drivers believed to pose a continuing hazard to the innocent road users.

Almost all our successful DUI interventions have achieved only modestly positive improvements. Interlock programs are promising, but there will always be some users who will circumvent the interlock. For them, there are more restrictive interventions such as electronic monitoring, house arrest, or transdermal alcohol sensors that can be imposed. Until we systematically use our leverage to make the consequences (including offender costs related to both money and freedom) contingent on the violations and an inability or persistent unwillingness to embrace change, then we are not likely to reduce alcohol-related crashes significantly.

Considering the low probability of detection and arrest of the average impaired driver, we should take full advantage of each occasion when someone is arrested driving with a high BAC. A combination of monitoring with all available methods is warranted if we are to improve the safety of the roadways.
References


An Evaluation of the Effectiveness of Ignition Interlock in California

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Introduction

Although significant progress was made in reducing alcohol-involved crashes during the 1980s and early 1990s, this progress stalled in the mid-1990s, prompting a renewed effort to find effective countermeasures to reduce drinking and driving further. One relatively new class of countermeasures targets offenders’ vehicles, rather than the offenders themselves. Ignition interlock devices show promise as a vehicle-based countermeasure, and several studies have examined their effectiveness in reducing DUI (driving under the influence), relative to license suspension and other more traditional sanctions. This paper reports the results of a recently completed evaluation of the effectiveness of ignition interlock efforts in California.

Most studies evaluating the effectiveness of interlock devices report that the devices are effective in reducing DUI, at least while they are installed on offenders’ vehicles. Two studies showed that interlocks did not work as intended. A 1990 study of a pilot ignition interlock program in California was unable to demonstrate that drivers installing interlock devices had different rates of subsequent DUI offenses than drivers in a matched comparison group (EMT Group, 1990). Similar findings were reported from an evaluation of Oregon’s pilot interlock program, where the evaluator summarized the study results by stating that interlock devices were effective while installed but were no more effective than license suspension (Jones, 1992).

Studies since then have found ignition interlock to be an effective DUI countermeasure. Research in North Carolina (Popkin et al, 1992); Ohio (Elliot and Morse, 1993); Alberta, Canada (Weinrath, 1997); and Illinois (Raub et al, 2003) showed that DUI offenders installing an interlock device have a lower rate of subsequent DUI convictions than similar offenders receiving other sanctions, such as license suspension. One study of ignition interlock devices in Maryland, notable for randomly assigning repeat DUI offenders to interlock or control conditions, found that offenders in the interlock group had substantially fewer subsequent DUI convictions than offenders in the control group (Beck et al, 1999).

The evidence on the effectiveness of interlock devices is somewhat mixed; nonetheless, the preponderance of evidence suggests that the devices are an effective DUI countermeasure while they are installed on offenders’ vehicles. The International Council on Alcohol, Drugs and Traffic Safety (ICADTS) issued a position paper on interlocks that comes to this conclusion and reports that interlock devices can reduce DUI recidivism by as much as 40 to 95% (Marques et al, 2001).
Although interlock devices can work when installed, implementing a successful ignition interlock program has proved elusive in most jurisdictions. Perhaps the biggest problem is getting the devices into vehicles; most studies show that only a minority of offenders will install interlock devices, even when ordered to do so by the courts (DeYoung, 2002; Marques et al, 2001). In addition, results from a process evaluation of California’s interlock program show that judges are reluctant to use interlock devices as a sentencing option, even when it is required by law (DeYoung, 2002).

This study is an outcome evaluation that examines the effectiveness of both the interlock devices themselves, as well as the judicial and administrative programs utilizing them in California. This study, like the earlier process evaluation of California’s interlock program, was mandated by the California legislature, and is intended to provide guidance on its legislation and policy regarding use of interlock devices. This study also intends to answer two questions that have received only limited attention in prior research:

1. Do the interlock devices, the judicial directives, or the administrative opportunities to use them work better with some types of drivers than others?

2. Do they have any impact on crashes overall (alcohol-related and non-alcohol-related)?

Methods

California’s ignition interlock laws prescribe and authorize the use of ignition interlock devices for offenders in different situations, so that California’s ignition interlock program has several different subprograms. Two examples are that (1) judges are required to order interlock devices for offenders convicted of driving while suspended, when the license is suspended for DUI (DWS-DUI), and (2) multiple DUI offenders can choose to end their license suspension or revocation term early by installing an interlock device and obtaining an interlock-restricted license from the Department of Motor Vehicles. Because of this, the outcome evaluation is comprised of six studies, each of which assesses the effectiveness of interlock devices or the programs utilizing them for different types of offenders, with the devices used in a specific context. Taken together, these six studies provide a comprehensive picture of the effectiveness of both interlock devices and the current programs utilizing them as a traffic safety countermeasure in California. A brief description of the six studies follows:

1. **DWS-DUI offenders with a court-ordered interlock device or restriction.** This sample was identified using court conviction data on department of motor vehicles (DMV) records and consists of drivers convicted of DWS-DUI who are ordered by the court to either install an interlock device, or restricted to driving only an interlock-equipped vehicle (eg, they do not own a vehicle). This study can be considered an evaluation
of California’s current judicial ignition interlock program, and thus is of central importance.

2. **DWS-DUI offenders with a court-ordered interlock.** This sample of drivers was initially identified using the DMV driver’s license database, and then tracked back to the adjudicating court. It differs from the first study in that it only evaluates the effectiveness of court orders to install an interlock device, ignoring interlock restrictions.

3. **DWS-DUI offenders installing an ignition interlock device.** This sample of drivers who actually installed an interlock device was obtained from records maintained by ignition interlock providers. It differs fundamentally from the other studies by focusing on the efficacy of the devices themselves, rather than the effectiveness of California’s interlock program and laws. Thus, this study provides information about whether the devices, when installed, can reduce DUI recidivism; this is fundamental because, if the devices are ineffective when installed, no ignition interlock program is likely to be effective. The data in this study represent DUI recidivism spanning both the periods of installation and after interlock removal.

4. **DUI first offenders with a court-ordered interlock device or restriction.** This study is similar to the first one in that it evaluates California’s judicial interlock program, but this study is different in that it focuses on the effectiveness of interlock laws for first DUI offenders (rather than DWS-DUI offenders). This sample was developed using DMV’s driver record database.

5. **DUI second offenders with a court-ordered interlock device or restriction.** This study is similar to study 4, but differs from it by focusing on second DUI offenders. Like study 4, it examines judges’ discretionary use of interlock devices for DUI offenders, when judges either order offenders to install a device or restrict their driving to only vehicles equipped with an interlock device.

6. **DUI second offenders installing an interlock device.** This study is unique in that it examines the effectiveness of California’s discretionary ignition interlock program, where multiple DUI offenders, after serving half of their period of license suspension, can install an interlock device in their vehicle to obtain a restricted driver license from DMV. All offenders provided proof of installation before receiving their licenses.

These studies can be termed quasi-experiments, in that it was not possible to assign offenders at random to either an interlock group or a comparison group. Drivers were sampled from DMV records (except for drivers in study 3, who were sampled from ignition interlock provider records) if they had a DWS-DUI or DUI conviction or had an interlock device installed on their vehicle between January 2000 and January 2003. Drivers were assigned to the interlock group if their DMV driver record indicated that they had an interlock device order/restriction/installation.
during the study period, or to the comparison group if they had no such order/restriction/installation.

The effectiveness of the ignition interlock was assessed by comparing the rates of subsequent DUI convictions and crashes between the interlock and comparison groups. A third outcome measure—subsequent DUI incidents, which represents DUI convictions, alcohol-related crashes, and administrative per se actions—also was examined. The results based on DUI incidents were very similar to those for DUI convictions for four of the six studies, and for the sake of brevity, the results for DUI incidents are only discussed for the two studies where they differed from those for DUI convictions.

A type of survival analysis, Cox regression, was used to determine whether there was a significant difference between the interlock and comparison groups on subsequent DUI offenses and crashes. This technique uses the number of days to first subsequent incident (for this study, the first subsequent DUI conviction or crash) to establish group survival rates; the rates of the groups can then be compared over time. The period for counting the number of days to first subsequent conviction/crash began at the point of interlock installation or order to install, and ended on September 1, 2003, the date at which the study follow-up period ended.

Because it was not possible to assign offenders at random to interlock or comparison groups, there is a possibility that the groups were not equivalent to begin with, and that this nonequivalency biased the results. To mitigate as much of this potential bias as possible, statistical controls were used on two levels. First, the comparison group was formed by matching comparison drivers to interlock drivers based on propensity scores group (Rosenbaum and Rubin, 1985), which were formed using data on the drivers’ prior driving records and demographics. This helped to ensure that the comparison drivers were as similar as possible to drivers in the interlock. In addition, statistical controls were used in the analyses of the data, by including information on drivers’ demographics and prior driving record. Although it is impossible to know whether all significant biases were controlled, the statistical controls and design that were used did control bias on those dimensions for which information was available.

**Results**

For the sake of brevity and clarity, the results from the six studies have been combined into two sections, the first dealing with the effectiveness of California’s judicial interlock program, and the second dealing with California’s administrative program. Studies 1, 2, 4, and 5 comprise the section on the judicial program, as they all deal with judicial orders to install an interlock and/or restrict driving to an interlock-equipped vehicle. These studies differ from one to another only by the offender group being examined.

Section 2 deals with California’s administrative program and includes study 6, where the focus is on second DUI offenders installing an interlock
and obtaining a restricted driver’s license. Section 2 also includes study 3, which examines all offenders installing an interlock. Although study 3 is not strictly confined to looking at California’s administrative program, it is included in section 2 because it is similar to study 6 in that both examine offenders who have actually installed interlock devices.

**Section 1. California Judicial Ignition Interlock Program**

For each of the four studies in this section, Cox regression models were developed for each outcome measure: days to first subsequent DUI conviction, days to first subsequent DUI incident, and days to first subsequent crash. Because studies 1 and 2 both addressed DWS-DUI offenders and because their results were so similar, they are combined for discussion purposes. The results are presented in an abbreviated fashion, in Table 1.

<table>
<thead>
<tr>
<th>Offender Group</th>
<th>OUTCOME MEASURE</th>
<th>DUI convictions</th>
<th>DUI incidents</th>
<th>Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies 1 &amp; 2: (n=6742/1691 group) DWS-DUI</td>
<td></td>
<td>Not Significant</td>
<td>Not Significant</td>
<td>Significant: Interlock 24–42% lower</td>
</tr>
<tr>
<td>Study 4: (n=1227 group) First DUI</td>
<td></td>
<td>Not Significant</td>
<td>Not Significant</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Study 5: (n=5416 group) Second DUI (directional)</td>
<td></td>
<td>Not Significant</td>
<td>Significant: Interlock 13% lower</td>
<td>Significant: Interlock 19% lower</td>
</tr>
</tbody>
</table>

The most notable aspect of Table 1 is that the results of the four studies on the effectiveness of California’s judicial ignition interlock program are mixed. It is clear, for instance, that the results for study 4, which examined first DUI offenders with high BACs, fail to show any evidence that interlock orders/restrictions are effective for this group. Judicial orders to install an interlock or restrict driving to interlock-equipped vehicles do not affect subsequent DUI convictions or incidents for first offenders, nor do they affect their subsequent crash rates.

There is more evidence that judicial interlock orders/restrictions are effective with second DUI offenders, as the results for study 5 show. There is a statistically significant association between judicial orders/restrictions and subsequent DUI incidents for this group ($p=.017$). The parameter estimates and associated hazard ratio for the treatment effect indicate that second offenders receiving a judicial interlock order/restriction have a 13% lower risk of subsequent DUI incident than second offenders not receiving an interlock order/restriction. The results for DUI convictions, while not statistically significant ($p=.085$), suggest that interlock orders/restrictions are also associated with a lower risk of subsequent DUI offenses for second DUI offenders.

DWS-DUI offenders, the focus of studies 1 and 2, do not appear to respond to judicial orders to install an interlock/restrict driving to an interlock-
equipped vehicle. There is no evidence that judicial interlock orders are associated with reductions in either subsequent DUI convictions or DUI incidents for DWS-DUI offenders. However, although interlock orders/restrictions do not appear to work as intended for this group, they do seem to be associated with a reduced crash risk. Interlock orders/restrictions are associated with a 24% (study 1; interlock orders/restrictions) to 42% reduction (study 2; interlock orders only) in subsequent crashes for DWS-DUI offenders.

It is likely that interlock devices do not reduce crash risks per se, but that offender noncompliance with judicial interlock orders is responsible for this reduction in crash risk. The process evaluation of California’s ignition interlock program (DeYoung, 2002) found that only a minority of offenders comply with judicial orders to install an interlock. Such offenders likely drive more carefully, and perhaps less often, knowing that they can be picked up on a bench warrant for not complying with a court order. This is similar to the effects of license suspension, where drivers drive more carefully and less often to avoid detection by law enforcement. Note that this same reduction in crash rates also occurs for second DUI offenders, probably for the same reasons.

Section 2. California Administrative Ignition Interlock Program

As was the case in section 1, Cox regression models were developed for each outcome measure for the two studies comprising section 2. Although the two studies comprising section 2 are somewhat different—study 3 examines all offenders who installed an interlock, whereas study 6 examines second DUI offenders who installed an interlock to obtain a restricted driver license—they are alike in that both focus on offenders actually installing an interlock. Study 3 can be thought of as an efficacy study that examines the effectiveness of the devices themselves, whereas study 6 is an evaluation of California’s administrative program for repeat DUI offenders. The results for both studies are presented in Table 2.

Table 2. Traffic Safety Effects of California Administrative Interlock Program

<table>
<thead>
<tr>
<th>Offender Group</th>
<th>OUTCOME MEASURE</th>
<th>DUI convictions</th>
<th>DUI incidents</th>
<th>Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 3: (n=4219 group) All offenders</td>
<td>Significant: Interlock 18% lower</td>
<td>Significant: Interlock 32% lower</td>
<td>Significant: Interlock 84% higher</td>
<td></td>
</tr>
<tr>
<td>Study 6: (n=600 group) Second DUI</td>
<td>Not Significant (directional)</td>
<td>Significant: Interlock 41% lower</td>
<td>Significant: Interlock 2.3 x higher</td>
<td></td>
</tr>
</tbody>
</table>

The most salient feature of Table 2 is that the results are almost all significant. Even the one nonsignificant result for second DUI offenders on DUI convictions is directional (p=.075), suggesting a connection between installing an interlock and a reduced rate of subsequent DUI convictions.

Clearly, when interlock devices are installed, they work as intended, reducing subsequent DUI incidents and DUI convictions. This is true for all offenders who install an interlock (study 3), as well as for second DUI
offenders (study 6). These results show that California’s administrative program (study 6), where repeat DUI offenders must install an interlock to obtain an interlock-restricted driver’s license, does work to reduce alcohol-related driving incidents. The results also show that the devices themselves are efficacious. That is, when installed, they appear to work as intended, reducing driving after drinking.

However, interlock installation has an unfortunate, unintended, side effect. The results for crashes are significant, but the parameter estimates and associated hazard ratios for the treatment effect indicate that the risk of subsequent crash is significantly higher for offenders installing an interlock. It is unlikely that interlock devices actually cause crashes. What is more likely is that offenders installing an interlock often obtain a restricted driving privilege because of the installation, and thus probably drive more often. In other words, it is an exposure effect: more time and miles on the roads lead to increased crashes. Although the crash rates increase because of interlock installation, it should be noted that, at least for drivers in study 3, the higher crash rates for drivers installing an interlock device only rise to about that of the average California driver. This raises interesting questions about how such increased crash rates should be regarded.

**Discussion and Conclusion**

This outcome evaluation of California’s ignition interlock program provides a comprehensive look at the effectiveness of both interlock devices, and programs utilizing them, not only in curbing alcohol-related incidents, but also in reducing all crashes, and it examines the devices used in different situations with different offenders. This broad examination yields results that are somewhat mixed; ignition interlocks are an effective DUI countermeasure, but they do not work for all offenders, and they do not work in all situations. This strongly suggests that ignition interlock devices and their programmatic use needs to be targeted to offenders and situations where they work most effectively, and integrated carefully with other DUI countermeasures that have been shown to be effective.

The strongest evidence for the effectiveness of interlock devices comes from study 3, which examined offenders who installed an interlock. The results show that interlocks work as intended to reduce subsequent DUI convictions and DUI incidents. Thus, the devices are efficacious; they work when installed.

There also is convincing evidence that California’s administrative ignition interlock program works as intended. The results of this study show that repeat DUI offenders who installed an interlock device to obtain a restricted driver license had fewer subsequent DUI incidents, and possibly DUI convictions, than repeat offenders who chose to remain suspended. The key to the success of this program is that offenders actually installed an interlock device.

There is less evidence that California’s judicial program is effective. Although it appears to be effective for second DUI offenders, it clearly is
not effective for first DUI offenders with high BACs. Interlock directives also do not appear to be effective in reducing subsequent DUI incidents for DWS-DUI offenders, for whom judges are currently required to order interlocks.

Therefore, interlock devices are efficacious, and they work as intended when installed. This is in accord with the findings of most other prior research on interlocks, which examine the effects of the devices when installed. However, developing a successful interlock program is another matter. California has attempted to develop a successful interlock program for two decades, with limited results. The key problem is judicial resistance to using interlock as a sentencing option, and offender resistance to installing the devices. The process evaluation of California’s program (DeYoung, 2002) showed that judges only order interlock devices for about 25% of DWS-DUI offenders who, by law, should receive such an order. In addition, only about 20% of offenders who receive a judicial order comply and actually install a device. This lack of compliance is likely responsible for the largely non-significant findings on the effectiveness of California’s judicial program.

Offender resistance also limits the effectiveness of California’s administrative program. Although the results of this outcome study show that California’s administrative program works as intended to reduce subsequent DUI incidents, the overall impact of the program is limited, because only about 5% of eligible repeat DUI offenders choose to end their license suspension early and obtain a restricted driver’s license by installing an interlock. This lack of participation also has been reported in prior studies.

Thus, a key issue to be resolved is overcoming judicial and offender resistance and getting the devices installed in vehicles before a successful interlock program can be developed. Surveys of judges, district attorneys, and offenders in California suggest that the cost of the devices and the monitoring of offenders are issues that must be resolved to develop a successful interlock program (DeYoung, 2002).

There also is an issue of the increased crash rates for those offenders who have installed devices. Traffic crashes increase when offenders install interlock devices because of increased exposure, but the rates only rise to about the level of the average California driver. Thus, compared to other typical sanctions, such as license suspension, interlock installation is associated with increased crash rates, but since the crash rates only rise to the level of the average driver, this is not a serious problem.

Conversely, judicial orders to install an interlock/restrict driving to an interlock-equipped vehicle are associated with a lower crash rate, probably because offenders alter their driving to avoid being apprehended for not complying with a court order. This is an unintended positive traffic safety effect of judicial interlock orders. This positive traffic safety effect suggests that DWS-DUI offenders should continue to be included in the judicial program, even though judicial orders do not appear to affect their drinking-and-driving behavior.
Based on the results of this outcome study, as well as the earlier process study, the following recommendations are offered.

1. **A strong monitoring system involving the courts, DMV, and law enforcement is essential for a successful interlock program.** This is important so that actions can be taken when offenders do not comply with court orders to install an interlock.

2. **Shorten the hard suspension period to encourage repeat DUI offenders to install an interlock device and become relicensed.** A period of hard suspension is essential and is required to comply with federal guidelines. Suspension also is very effective in reducing crashes, primarily because offenders reduce their driving and drive more carefully to avoid detection. However, suspension terms can be shortened, for instance, by allowing repeat DUI offenders to serve only their administrative per se suspension (and not their post-conviction suspension) if they install an interlock device.

3. **Introduce legislation allowing peace officers to impound the vehicles of drivers restricted to driving an interlock-equipped vehicle, who are apprehended driving a non-interlock-equipped vehicle.** This would use a proven-effective countermeasure to deter offenders from violating their interlock restriction.

4. **Convene a task force comprised of representatives of all elements in the DUI countermeasure system to investigate barriers and develop solutions for using interlocks.** Developing a successful interlock program has proved elusive in most jurisdictions. A concerted effort in each jurisdiction to identify and overcome existing barriers will help utilize the devices.

5. **De-emphasize the use of judicial interlock orders for first DUI offenders.** Although their high BACs likely indicate an alcohol problem, judicial orders to install an interlock or restrict driving to an interlock-equipped vehicle have had little impact on first DUI offenders in California.
References


Section 2: Policy Issues
New Mexico Interlock Laws Allow Revoked Offenders to Drive

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Introduction

Recognizing that interlocks effectively reduce DWI (driving-while-intoxicated) recidivism, the New Mexico (USA) legislature and two governors have passed laws to increase the use of interlocks. The New Mexico laws do not conform to the hard suspension requirements in the federal TEA-21 legislation; consequently, the state has been nominally penalized with up to 3% of the funds normally provided by the federal government to New Mexico for highway construction transferred to safety programs. Currently, both state and federal laws require the interlock for all repeat DWI offenders, but in addition to mandating ignition interlocks for most DWI offenders (including high-risk first-time offenders), New Mexico’s new DWI law allows offenders to drive interlock-equipped vehicles legally, even while their driver’s licenses are revoked. This novel feature of the New Mexico laws conflicts with the TEA-21 requirement of a lengthy minimal period of hard suspension.

In 2002, Governor Gary Johnson signed a mandatory ignition interlock bill that became effective January 1, 2003. This law mandates interlocks for first-time aggravated offenders (arrest BAC≥.16) and all repeat DWI offenders. Further, it makes interlocks optional for first-time non-aggravated offenders.

In New Mexico, driver’s license revocations have ranged from 90 days for first-time nonaggravated offenders up to 10 years for those convicted of three or more DWI offenses within 10 years. Evidence from research studies in several states consistently has shown that a high proportion of revoked offenders continue both to drink and to drive. Even though the new law made interlocks mandatory, the courts initially were reluctant to impose this sanction because revoked offenders could not legally drive under any circumstances. That problem was eliminated in New Mexico in 2003.

In March 2003, Governor Bill Richardson signed the Ignition Interlock Licensing Act, making it possible for a revoked offender to obtain a license to drive an interlock-equipped vehicle—anywhere, anytime—as long as the vehicle was insured. Conversely, the privilege of driving a vehicle without an interlock remains revoked, and an offender who does so, even when sober, is subject to severe penalties. This law was intended not only to make it possible for revoked offenders to drive legally when sober so they can work to support a family, but also to reduce the reluctance of judges to mandate the interlock sanction on offenders who

License revocation and license suspension are often the same, but states differ in which word they use.
could not drive legally. Now the courts have legislative authorization to allow an offender to drive an interlock-equipped vehicle even while general driving privileges are still revoked.

Thus, DWI offenders, whose licenses are revoked, may choose insured, interlock-only driving as an alternative to license revocation in New Mexico. The hoped-for result is that these new laws will reduce the number of drivers who are unregulated, alcohol-impaired, and uninsured, and who continue to drive even while suspended.

How did these bills become law?

These two bills were passed unanimously by New Mexico's House and Senate. Effective lobbying convinced legislators that the option of legally driving interlock-equipped vehicles would be more effective, less costly, and fairer than license revocation, despite the federal sanctions. As is so often the case with legislation that intends to lower the public risk of exposure to alcohol-involved drivers, there were personal experience factors operating for legislators on both sides of the political spectrum. Passage of the bills was enhanced by the support of two senators: one, a Democrat, said that an interlock program had made a significant contribution to his recovery from alcoholism, and the other, a Republican, had had a sister-in-law and nieces killed by a drunk driver. These bills were eventually supported, or at least not opposed, by the New Mexico Transportation Department, the Traffic Safety Bureau, the Motor Vehicle Division, the Administrative Office of the Courts, the Trial Lawyers Association, the District Attorneys Association, and Mothers Against Drunk Driving (MADD).

These laws have a logical basis.

Recent summaries of the research evidence have concluded that interlock programs reduce DWI recidivism very effectively (Coben and Larkin, 1999; Marques et al, 2001; Beirness and Marques, 2004). However, administrative programs that are managed by motor vehicle authorities are voluntary (eg, someone has to choose to install an interlock in exchange for a shorter period of license suspension), while delayed interlock programs, which are only implemented after long periods of suspension, usually reach only a small fraction of DWI offenders. In contrast to the very rare judicially mandated programs that are backed up by the threat of jail and get more than 60% of offenders install interlocks (Voas et al, 2002), less than 10% of the eligible offenders install interlock devices in most jurisdictions. In the absence of a strong incentive like jail or house arrest, when given the choice to install or not install, most offenders will risk driving illegally (ie, without a driver’s license) to avoid the costs and inconveniences of installing an interlock. Moreover, these offenders soon learn that they are unlikely to be apprehended and often decide to not apply for a license even at the end of their revocation period.

5 The Transportation Equity Act for the 21st Century (TEA-21) penalizes states that do not require a 1-year hard license suspension for all repeat DWI offenders. The sanction transfers up to 3% of Federal Highway Construction Funds to Traffic Safety or Hazard Elimination Projects. In 2005, reauthorization and revision of US TEA-21 is underway. Among legislative revisions being considered in the Senate is one provision that would reduce the mandatory suspension to 90 days if an interlock were installed for the rest of the suspended/revoked period.
Hard revocation or suspension does reduce impaired driving more than doing nothing and accordingly there is support for this approach both in the literature and among many safety advocacy organizations. Mandatory license revocation laws are associated with a small decrease in nighttime crashes, and there is evidence that some suspended offenders drive more carefully when they do drive a car. However, these judgments preceded the availability of interlocks. There also are negative effects to hard revocation that the New Mexico laws seek to overcome.

The negative side effects of hard revocation

- Up to 75% of revoked offenders continue to drive (Ross and Gonzales, 1988; Voas and DeYoung, 2002).
- Revoked DWI offenders drive without insurance. In New Mexico, 50% of the alcohol-impaired drivers in crashes were uninsured.
- Offenders often learn during the period of revocation that they can drive, unlicensed and uninsured, without being caught; consequently, this lessens their fear of law enforcement.
- Less than 20% of offenders apply for reinstatement of their licenses during the 3 years after which they became eligible (Tashima and Helander, 2002).
- In New Mexico, offenders whose licenses have been revoked drive after drinking an average of 50 times per year.

The positive benefits of interlock programs versus license revocation

- Interlock programs reduce recidivism 40% to 90% while allowing offenders to drive when they are sober.
- Interlock programs allow offenders to be productive citizens and participate in family life.
- The cost of the interlock program is borne by offenders, not by the state.
- By consistently rewarding the correct behavior and disallowing the wrong behavior, interlocks provide a behavior modification service.
- By serving as a constant monitor of drinking and driving, an interlock functions as a 24/7 probation officer in the offender’s vehicle.
- Interlocks store BAC data that can be used to predict future drunk driving (Marques et al, 2003a, 2003b) and, thus, can be used to support compliance-based removal decisions by judges.
- Interlocks restrict all household members who drive the interlock-equipped vehicle to drive only while sober.
Preliminary New Mexico Data

In the 2½ years before January 1, 2003, interlocks were an optional sanction for those with second and third DWI convictions. During this time, only 510 of 30,000 convicted offenders were required to have interlocks installed. The average installation time for this group was 6 months, and the recidivism rate during this 6-month period was 1.5% (approximately 3%/yr).

In 2003, 2010 DWI offenders had ignition interlocks installed in New Mexico. Of these, 1941 (96%) were matched with DWI arrests in the Motor Vehicle Division Citation Tracking System (CTS), and it was found that the average interlock-using offender had 2.8 arrests before receiving the interlock. From this group, there were 51 DWI arrests of offenders during the 234 days after interlock installation (the median follow-up time). This is a recidivism rate of 2.6% (4.1%/year). Most interlock installations were court mandated, but about 800 were voluntarily installed by revoked offenders in order to qualify for the ignition interlock license, which became available in June 2003.

Using the combined group (volunteers and court-mandated offenders), the average number of DWI arrests before interlock installation was 2.9 (e.g., almost 3 prior arrests). In New Mexico, the DWI re-arrest rate for offenders with 3 prior DWI offenses is 12.8% a year. So, if the interlock users are free of selection biases that render them lower risk, these preliminary data indicate that the DWI recidivism rate of interlocked offenders is just 25 to 30% of the rates for noninterlocked offenders with comparable prior offenses. A more careful selection of the comparison group, a longer follow-up period, and a definitive separation of voluntary and mandatory installations are required before a more precise evaluation of the New Mexico interlock program can be completed, and that research is underway now. The direction and magnitude of effect presented here, however, are comparable to those reported by others.

Loopholes and Challenges for the Current New Mexico Interlock Laws before 2005

Following are some facts regarding DWI arrestees in New Mexico:

- 35% of those arrested for DWI are not convicted.
- 30% of DWI convictions are for first-time nonaggravated offenders (BAC <0.16%). Interlocks had been optional for this group.⁶
- 50% claim they “do not own a car” or have decided “not to drive.” The New Mexico laws require interlocks for “all vehicles driven by the offender.”
- 50% of those mandated to install interlocks do not. One disincentive appears to be that penalties are less than the cost of the interlock plus

⁶ 2005 legislation has made interlocks mandatory for all DWI offenders.
insurance. It may be that a stronger threat such as house arrest, as implemented in Hancock County Indiana and described in Voas et al (2002), will be needed to increase motivation for interlock.

- Existing stiff penalties for driving a vehicle without an interlock are rarely enforced.

- Compliance-based removal is rarely used by judges but if it were used it could keep more people on the interlock until they are ready for unrestricted licenses. Compliance-based removal means that the judge would extend the interlock program for any offender who had not demonstrated the type of driving that is consistent with safety, or who had not demonstrated convincing regular use of the interlock vehicle. Drivers need to do some minimal amount of driving to assure that the interlock car is being used. The driving that is done should convincingly demonstrate a sustained clear period with no failed interlock BAC tests, that is, no attempts to drive with elevated BAC.

First-time nonaggravated offenders receive only 90 days of administrative revocation but are court-mandated to drive only an interlock-equipped vehicle for up to one year. Therefore, some offenders become eligible for an unrestricted license to drive any vehicle while still mandated by a judge to have an interlock installed in every vehicle they drive. This conflict of laws must be eliminated through clarifying legislation.

**Closing the Loopholes, Meeting the Challenges**

These loopholes are not unique to New Mexico. They can, however, be closed if the legislature and the governor are willing and if the courts will then enforce the laws. New Mexico is fortunate to have stiff penalties for any revoked offender who drives a vehicle without an ignition interlock and an ignition interlock license. Here are some examples of additional legislative policies needed to strengthen the laws:

- Make it illegal to allow an impaired person to drive a vehicle that another person owns.

- Require immobilization of vehicles driven by any person arrested for DWI.

- Remove immobilization device only if an interlock is installed or if there is a successful administrative appeal of the DWI arrest.

- Provide a multilingual certified notification to household members of the penalties for allowing even a sober interlocked offender to drive a non-interlock-equipped vehicle.

- Forbid registration of any non-interlock-equipped vehicle owned by a DWI offender.

- Institute a compliance-based interlock removal program; that is, judicial certification attesting to no recorded BAC > 0.05% for a continuous period of 1 year before an interlock can be removed.
Questions That Can Be Answered by Evaluation of the New Mexico Program

Three interlock research studies are currently underway in New Mexico to evaluate the impact of these new laws: a NHTSA study to evaluate the mandatory law, a RWJ Foundation study to evaluate the interlock licensing law, and a TSB funded study to evaluate widespread use of the interlock in Santa Fe County. Some of the following questions will be answered by these studies.

- Are judges enforcing the law that requires interlocks for first aggravated and all subsequent offenders?
- Are offenders having interlocks installed when required to do so?
- Are court-mandated offenders applying for the interlock license? And if so, do they get it?
- Are nonmandated offenders applying for and getting interlock licenses? If so, how many?
- Is the interlock reducing recidivism of offenders?
- How can we rectify existing loopholes in the laws?
- Are interlocks available throughout the state and to what extent?
- Are license revocation and interlock-driving showing measurable results and, if so, what is the relative effectiveness?
- Are judges following up on interlocks they have required and using their option to insist on compliance-based removal of the interlocks and, if so, to what extent?

What Is Happening Now?

New Mexico has a serious DWI problem, but it also has a governor and legislature focused on reducing the problem. The governor has convened a Multi-Agency DWI Task Force and an Ignition Interlock Committee, and he is in the process of appointing a statewide DWI coordinator with a staff to implement the recommendations of the committees. The citizens of New Mexico also are solidly behind efficacious and cost-effective efforts to reduce the deaths and injuries that result from DWI. Closing the loopholes in our Ignition Interlock Program should contribute to the solution by reducing DWI recidivism. However, careful research will be needed to point the way to the most effective DWI solutions.
References


The Hard Suspension Barrier: Does New Mexico’s Interlock Licensing Law Solve the Problem?

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Introduction

Interlocks are effective.

There is strong evidence that DUI (driving-under-the-influence) offenders who participate in interlock programs have 50% to 75% lower recidivism rates while on the interlock than similar offenders whose licenses have been fully suspended (Coben and Larkin, 1999; Shults et al, 2001; Voas et al, 1999). The main challenge to this evidence is the inability of most courts to motivate more than 10% of the DUI offenders to participate in interlock programs (Simpson et al, 1996). This suggests that interlock participants might have had lower recidivism rates in any event. With the exception of one study (Beck et al, 1999), no randomized studies within the judicial setting have been conducted; therefore, it has not been possible to resolve this issue fully. However, early results from studies of the interlock law in Quebec, Canada, where usage rates are substantially higher, have found substantial recidivism reductions among interlock users (Vézina and Dussault, 2001). Despite the lingering question of how extensively the personal characteristics of interlock users contribute to their lower recidivism rates, it appears clear that placing DUI offenders on interlocks, rather than simply suspending their licenses, reduces the probability of their being rearrested for impaired driving.

Mandatory programs may conflict with license suspension/revocation laws.

Although several states have mandated interlocks for multiple DUI offenders, such programs have generally failed to result in a high proportion of offenders on interlocks. An important barrier to the effectiveness of such laws has been the conflicting requirements of laws mandating administrative license actions by departments of motor vehicles (DMVs). These include implied-consent suspensions/revocations for refusals of the breath test, administrative license revocation/suspension (ALR/ALS) laws for offenders with BACs (blood alcohol concentrations) higher than the permissible limit, and mandatory suspensions/revocations for a DUI conviction. These laws generally specify a minimum period of full or “hard” license suspension/revocation for a DUI offender that precludes the issuance of a limited or “hardship” license to go to work or a limited license for driving an interlock-equipped vehicle. Judges generally have been unwilling to require the installation of an interlock when the offender is fully suspended or revoked and therefore unable to drive legally under any circumstances.
California provides an example of such a conflict. State law requires a 2-year hard suspension for second DUI offenders and, simultaneously, requires judges to impose a mandatory interlock law sanction on multiple offenders. Despite the interlock mandate, few judges applied the sanction. They argued that it would send the wrong signal suggesting that, despite the full suspension, the court expected the offender to drive anyway. DeYoung (2002) studied the implementation of the California interlock law and found that only a small portion of all eligible offenders installed interlocks. Further, the interlock programs were poorly monitored, and many offenders failed to install interlocks despite the court order. Consequently, they appeared to have little impact on recidivism. Although the old, relatively unused law is still in place, California has enacted new legislation that allows offenders the option of installing an interlock during the second year of the mandatory full-suspension period (DeYoung, 2002).

Congress, in reauthorizing the Highway Safety Act—the Transportation Equity Act for the 21st Century (TEA-21)—required states to enact a minimum one-year hard suspension for second DUI offenders or face a 3% transfer of their highway construction funds to safety programs. Although this provision has been eliminated from the extension of the law in 2005, while it was in effect, it disrupted some existing mandatory interlock programs such as that in Texas, which provided for one year on the interlock for second DUI offenders from the date of conviction. TEA-21 required states to provide for the impoundment of the vehicle or the installation of an interlock on the vehicle of second offenders after a year of hard suspension. Because imposition of the interlock by the court following conviction was in conflict with the mandatory one-year hard suspension/revocation, a number of states (Colorado, Michigan, and Florida among others) have enacted laws requiring offenders to install the interlock as a condition for license reinstatement after they have completed the hard suspension/revocation period. Because many DUI offenders do not reinstate when eligible and some postpone reinstatement indefinitely, the effectiveness of that procedure remains to be determined.

Three types of DMV policies

Court-ordered interlock programs make the interlock a condition of probation and, potentially, provide the strongest incentive for offenders to install interlocks because failure to do so can result in relatively severe consequences. However, the court action may be impacted by the various laws relating to the role of DMVs in imposing licenses suspensions on DUI offenders. These fall into three categories:

- **DMV policies that relate to ALR/ALS laws**: DMV programs under ALR/ALS laws sometimes support and sometimes conflict with court interlock actions. They support the court action if the law permits the issuance of a limited license to operate an interlock vehicle. Conversely, they potentially can interfere if the department is prevented by law from issuing limited licenses that permit the
installation of an interlock for DUI offenders suspended under ALR/ALS laws. States with such policies include Texas and California.

- **DMV policies that relate to suspension/revocation periods:** Where state laws require a hard suspension period, interlock licenses cannot be issued. Conversely, some state laws provide that a portion of the administratively required full-suspension/revocation period can be served with an interlock vehicle. States with this type of policy include California and Delaware.

- **DMV policies that relate to license reinstatement:** As noted, some state laws make the installation of an interlock a condition of reinstatement. They can delay eligibility for full reinstatement or prevent it without interlock installation. Examples of states with this type of policy include Pennsylvania, Michigan, Iowa, Florida, and Oregon.

### The New Mexico Law

On January 1, 2003, New Mexico implemented a law that mandates interlocks for first-time aggravated offenders (arrest BAC $\geq 0.16$) and all repeat DUI offenders. To avoid a conflict with administrative revocation requirements, the state's legislature passed a companion law, Ignition Interlock Licensing Act (IILA), in March 2003, which became fully effective in June of that year. That innovative law has implications for all three types of administrative policies listed above. The law made it possible (with minor exceptions such as for those guilty of vehicle manslaughter) for revoked offenders to get a license to drive vehicles equipped with interlocks at anytime, provided they have insurance. This made it possible for suspended offenders, mandated by the courts to install interlocks, to obtain licenses to operate the interlocked vehicle, thus potentially eliminating the conflict. At the time, this did not overcome the problem created by TEA-21. New Mexico was still subject to the 3% transfer of its highway construction funds because offenders could be on the interlock instead of being fully suspended during the first year following their conviction as required by the federal legislation. However, Congress changed that provision, so it is no longer a problem.

The New Mexico interlock laws and their dates of passage follow:

- **July 1999**—Interlock is optional for second and third DUI.
- **January 2003**—Interlock is mandatory for all aggravated and repeat DUI.
- **January 2003**—Interlock indigent fund:
  - Judges decide when it applies
  - Fund pays first 4 months on interlock
  - Fund levies 10% surcharge on interlock rental for nonindigents
- **June 2003**—IILA: an alternative to license revocation—allows for re-entry of DUI offenders to legal driving if they install an interlock.
April 2005—Two new laws mandate interlocks for all DUI offenders, close some loopholes, synchronize judicial probation and interlock mandates, and extends ALR to match interlock requirement. Most significantly, the law extends the requirement for interlocks, mandating 1 year for first offenders, 2 years for second offenders, 3 years for third offenders, and lifetime for fourth offenders.

The June 2003 IILA law is important because it prevents a conflict between the mandatory license suspension requirements of the ALR/ALS law and court-ordered interlock programs. The IILA also makes it possible for currently suspended offenders to apply for an interlock license in lieu of remaining fully suspended for the remainder of their revocation period. In such cases, the length of the interlock period is determined by the remaining suspension period and can extend to several years. However, in some cases, because of delays in trials, the ALR/ALS statutory suspension period may expire before the court-ordered interlock probation period has ended. Currently, this allows such offenders to reinstate their regular licenses while still in the court-ordered interlock program. This potentially requires the probation department to increase its oversight of interlock offenders to ensure that they are not driving non-interlock-equipped vehicles. A law enacted in 2005 ensures that the license suspension period does not expire before the end of the court-mandated interlock program.

An important support for the New Mexico mandatory interlock laws is the interlock indigent fund, which reduces one factor often cited by the courts for not imposing the interlock on offenders who claim to be unable to meet the installation and monthly maintenance costs. None of the laws, however, overcome a major limitation in mandatory interlock programs, which is the ability of offenders (most of whom resist an interlock program) to avoid installation by claiming not to own or have access to a vehicle in which an interlock can be installed. Although this leaves the offender fully revoked under the state’s ALR law, it prevents the court from mandating the interlock. The only potential remedy is to apply pressure for the offender to produce a vehicle on which an interlock can be installed by making the alternative to the interlock a more disliked penalty, such as electronically monitored house arrest. The effectiveness of this alternative for motivating the installation of an interlock was demonstrated by a judge in Indiana (Voas et al, 2002).

**NHTSA Contract to PIRE**

The National Highway Traffic Safety Administration (NHTSA) awarded a contract to the Pacific Institute for Research and Evaluation to study the impact of New Mexico’s interlock laws. For this study, July 1999 through December 2002 will serve as the baseline period during which the courts left open the option of whether to require DUI offenders to install interlocks. Participation during that period will be contrasted with the following period (July 2003 to December 2004) when both the mandatory law and the IILA were in place. There is already some evidence that interlock installations have increased dramatically since the baseline period ended in January 2003 (see Figure 1).
Study objectives

The NHTSA-funded evaluation program has four major objectives:

- Evaluate the impact of the mandatory law.
- Evaluate the predictive validity of breath-test patterns in the BAC record.
- Identify features of the new law that contribute to reduction in recidivism.
- Identify the law’s shortcomings and remedies to improve it.

This new research program focuses on the impact of the mandatory law rather than the IILA. The effort is centered on evaluating the impact of court-mandated interlocks on DUI recidivism and crashes. In addition, we also will extend our previous research (Marques et al, 2003) on the predictive validity of the BAC record from the interlock recorder for estimating future impaired driving (recidivism and crashes). Because the New Mexico-mandated interlock legislation involves three different laws, is relatively complex in its application, and applies to both current and past offenders, we will assess the relative significance of the various features of the laws. Thus, we will evaluate the impact of the mandatory law in relation to new offenders who avoid the interlock sanction and those long-term offenders who elect to install interlocks in order to drive legally.
Analysis of loopholes in the law

We also will attempt to study limits in the law or in the court procedures that affect the proportion of arrested offenders that wind up installing interlocks. Following are some issues that will need to be considered:

- Arrested DUI offenders often avoid adjudication.
- Technicalities frequently result in not-guilty verdicts.
- The court often does not require the interlock when the offender does not own a vehicle or agrees not to drive.
- When the offender fails to install an interlock when mandated to do so, there is often no systematic follow-up.
- Interlock vendors currently are not required to report to the Motor Vehicle Division (MVD).
- In the past, the ALR period could end before the interlock period ended, potentially undermining the need for the interlock to drive legally. This problem appears to have been eliminated by the 2005 legislation.

Despite the mandating of interlocks for all second and aggravated first DUI offenders, a large proportion of those apprehended for those offenses avoid interlock programs. Approximately 35% of drivers arrested for impaired driving are not convicted of that offense; consequently, they will not be subjected to a mandated interlock program. Further, some of those convicted who are mandated by law to participate in an interlock program are not receiving a court installation order. The reasons for this are not entirely clear; however, the law provides that the offender “must install an interlock on any vehicle he or she intends to drive.” This opens the possibility for offenders to claim either that the do not have access to a car or that they do not intend to drive. This permits the court to excuse offenders from installing interlocks if they agree not to drive. However, some courts are imposing a more severe sanction, such as house arrest, on those who claim not to have a car. Finally, as in most states, some mandated offenders may fail to install interlocks. The success of the courts in issuing warrants and bringing in these scofflaws for further sanctioning is not yet known. Vendors also are not currently required to report to the MVD on interlock cases that result from interlock license applications from long-term offenders that do not go through the courts.

As noted, there is an important loophole between the laws providing for administrative revocations and the court procedures for mandating interlocks. The benefit of the interlock license to the offender is conditioned upon the individual’s license being fully revoked under the ALR law and leaving the offender with no other recourse for legal driving. When the period of revocation ends, the offender can legally drive any car at anytime. In the case of high BAC first offenders who receive a 3-month license revocation, the court-ordered interlock program period may not begin for several months because of delays in trial proceedings. Conse-
sequently, the court-ordered interlock period may run well beyond the end of the DMV full administrative revocation. When the administrative revocation ends, the offender can be fully relicensed and, therefore, is free to drive non-interlock-equipped cars. Although the offender will presumably still be subject to probation and court monitoring until the interlock requirement has been met, it is not clear to what extent the court can control the driving of non-interlock-equipped vehicles during this period. As noted, there is action underway in the state legislature to correct this problem.

Study will require a complex analysis of multiple datasets.

The New Mexico laws appear quite straightforward; nonetheless, evaluation of their impact involves significant complexity. As shown in Figure 2, we expect to identify eight outcome groups from the court-mandated interlock process. This large number of groups results from the multiple pathways through the judicial system. Many arrested offenders will not be convicted for a DUI offense to which the mandatory interlock law applies. Further, though the intention is for judges to sentence those eligible for the interlock to such a program, many offenders will avoid installation by claiming not to own a car. We will attempt to contrast the driving records of these groups from the day of their arrest, using their prior records as a covariate in the recidivism analysis.
Figure 2. Offender Groups To Be Studied
To conduct the recidivism study and to meet the four objectives listed above, we will collect data from the following large set of measures:

- **Interlock installation and removal** information is being provided by the interlock program providers.

- **Interlock vendors’ reports to the court**: Copies of these reports will be requested from interlock program providers.

- **Interlock event recorder data** are being collected and entered onto a statewide file by the Administrator of the Courts and will be made available to the project.

- Interlock licenses that have been granted will be reported by the MVD.

- **Interlock mandates from court** will be tracked through offender questionnaires administered at the time of interlock installation.

- **DUI arrests and convictions** are available from the statewide Citation Tracking System.

- **Other traffic citations** are available from the MVD driver files.

- **Crash data** are available from the state crash files.

- **Court process information** will be collected through interviews with key personnel including prosecutors, defense attorneys, judges, and probation officers.
To provide time to collect a sufficient number of cases and to permit post-adjudication driver records to mature, the research plan will require 3 years (see Figure 3). By the end of that period, we expect to have a good indication of the extent to which the mandatory interlock law in combination with the IILA has increased the use of interlocks in New Mexico and whether this increase has produced the expected reduction in recidivism and crash involvements of DUI offenders.

![Figure 3. Timeframe for Research Program](image)

**Discussion**

The use of interlocks has been limited by a number of factors, some of which are (1) the failure to prosecute DUI offenders or the acceptance of plea bargains or sanctions that avoid interlock sanctions; (2) the conflict between ALR periods and interlock program periods (which appears to have been corrected by the 2005 legislation); (3) the cost of interlock programs, (4) the ability of offenders to avoid the interlock requirement by claiming not to own a car or pledging not to drive; and (5) the failure of offenders to follow the court’s instructions to install an interlock. The New Mexico interlock laws should reduce the effect of some of these factors. Because the administrative revocation for the DUI offense is imposed at the time of arrest and is independent of the court action, the immediate availability of an interlock license may make installation a method for continuing to drive with minimum interruption and reduce the interest in making the interlock an issue in plea bargains.

The principal impact of New Mexico’s laws will be to remove the revocation status of the offender as a basis for the court not mandating an
interlock. Because the issue of cost to the offender is reduced by the availability of the state’s interlock indigent fund, this should clear the way for mandating the interlock on most, if not all, aggravated first DUI offenders and all second and subsequent DUI offenders. This objective is significantly threatened, however, by the provision of the law that allows the offender to avoid the interlock by pledging not to drive or by claiming not to have a car. Although offenders who make that choice will remain fully suspended, these provisions undermine the mandatory feature of the New Mexico law, thus making it more similar to “voluntary” programs in other states where offenders are simply offered the opportunity to install an interlock to drive legally rather than be fully suspended. An important issue in the study will be whether courts respond to low-installation rates by using other sanctions, such as house arrest, to motivate compliance with the mandatory interlock program.

An interesting sidelight provided by the IILA is its provision for the reentry of long-term suspended drivers to legal driving status through the installation of an interlock. Based on current interlock rates in “voluntary” programs, up to 10% of offenders serving long-term revocations may make use of this provision. This could provide for significant growth in the number of offenders in interlock programs. In the long term, it will be interesting to determine whether this provision produces an overall safety benefit. Although long-term revoked drivers are probably doing some impaired driving, they are likely to be restricting the amount of their driving overall to avoid apprehension. If they install interlocks, the amount of impaired driving may be reduced but overall driving mileage and exposure will probably increase, leading to greater non-alcohol-related crash involvement. Because long-term revoked drivers who elect to accept the interlock are likely to be a lower risk group than those who choose to continue to drive illicitly, it will be difficult to get an unbiased assessment of the effectiveness of this provision of the law.
References


The Insurance Industry’s Role in Promoting the Use of Alcohol Ignition Interlocks

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Introduction

As discussed elsewhere in this report, alcohol ignition interlocks appear to reduce recidivism effectively among some groups of impaired-driving offenders. Accordingly, interlocks are expected to reduce alcohol-related crashes among these drivers, and therefore, the human and economic costs associated with these crashes. Interlocks, however, are used as a sanction in only a small percentage of the eligible driving-under-the-influence (DUI) cases. This paper will focus on the role that the insurance industry could take in providing incentives for broader use of interlocks.

The automobile insurance industry can help to promote and expand the use of alcohol ignition interlock devices. By so doing, it would reduce the incidence of unlicensed driving, and increase the number of drivers who are properly insured. These steps could lead to improved traffic safety and reduce uncompensated losses. The insurance industry has been active in loss reduction activities, not only to reduce automobile crashes, but also in many other fields and industries. Working to increase ignition interlock use could be considered a loss reduction effort if interlocks can be shown to reduce costly alcohol-related crashes.

This paper will discuss how automobile insurance rates are set in the United States, examine how a DUI offense affects a driver’s auto insurance rates, discuss some initiatives from other countries, look at possible reasons why an insurance company might offer a discount to its DUI offender customers, examine what the insurance industry could do, and describe the impediments to doing it.

Automobile Insurance Rates in the United States

The rate a person pays for car insurance depends upon his or her risk, an assessment made by the insurance company offering the policy. Insurance companies base their insurance rates on the calculated risk of an individual getting into an accident. They estimate this risk not only on an individual’s driving record, but also by looking at the categories into which he or she fits, including age, sex, and marital status. In some states, where a person lives also has an impact, and even an individual’s credit score is considered. Other factors considered are the age, make, and model of the vehicle; purpose the vehicle serves; and the estimated amount and type of driving that is planned.

Insurance companies use statistical history to determine current rates. Rates are based on the amount needed to pay all claims and company business expenses, as well as the estimated costs to cover accidents that
may happen in the future. Of course, companies cannot see into the future, so to set their price rates for a vehicle and its driver, they use information about an individual’s past claims experience. Auto insurance companies price policies based on the amount they will need to cover:

- Accidents that have occurred.
- Claims salaries, building leases, and other claims-related costs.
- Non-claim expenses such as customer service salaries, advertising, and the price of selling policies (Instant Auto-online, 2004).

The lowest auto insurance rates are found in the “preferred” market. The preferred auto market refers to a type of risk most desired by an insurance company. Individuals eligible for this market generally have few if any accidents or violations. The typical preferred program has lower rates than the other programs, coupled with stricter underwriting standards. Other requirements might involve the type of car (no sports cars) or the age of all drivers (no drivers younger than age 25).

If an insurance company does not rate an individual eligible for coverage in the preferred market, the next best option is the standard market. Purchasing insurance in this market is more expensive. In addition, independent agents can help a person with a poor driving record find a private carrier specializing in high-risk drivers (Heimer and Breckenridge, 2002).

**Effect of a DUI Offense on Auto Insurance**

The effect of a DUI offense on insurance costs depends upon several factors, including the driver’s past record, the driver’s state of residence, and the driver’s insurance company. If an insurer discovers a DUI offense on the driver’s record, higher rates and possibly policy cancellation or nonrenewal are likely.

Insurance companies generally deal with customers convicted of DUI in two ways. The insurer first will likely raise a driver’s insurance premiums and second will categorize the individual as a “high-risk driver.” When an insurer does learn of a DUI conviction, it does not automatically impose higher premiums. The insurer will look at a driver’s record with the company and claims history.

For example, one major insurance company will often move a driver’s policy to a subsidiary of the company that issues standard policies and out of the company that issues preferred policies. If moved from preferred to standard status, a driver will pay higher rates. The company also will review the driver’s motor vehicle and insurance claims history to determine if it needs to raise the rates even further (Insure.com, 2004).

For drivers who cannot obtain auto insurance coverage on the open market, U.S. states have what is known as the “assigned risk pool”—a state-run system that forces all carriers to share the burden of insuring the riskiest drivers. Policy costs in the assigned risk pools are 50% higher on
average than private insurers, according to Robert Hunter, director of insurance for the Consumer Federation of America (Heimer and Breckenridge, 2002).

**Automobile Insurance in Canada**

In three provinces—Québec, Saskatchewan, and British Columbia—the government issues automobile insurance.

Québec has a public no-fault insurance plan that covers personal injury claims resulting from traffic crashes. This plan is administered by La Société de l’assurance automobile du Québec (SAAQ). The SAAQ is a provincial government agency that, organizationally, falls under the authority of the Minister of Transport. In Québec, the SAAQ is both a public insurance company and the Province’s driver licensing authority. Private insurance companies in Québec do offer coverage for drivers but only for vehicle property damage claims.

Saskatchewan, through the Saskatchewan Government Insurance (SGI), operates a mandatory vehicle registration and insurance program. When a vehicle owner purchases license plates, he or she also purchases a basic package of insurance that includes coverage for damage to his or her vehicle, coverage for personal injury as a result of a vehicle crash, and liability insurance for damage his or her vehicle may cause to the property of others or injuries to other people. The basic premium for a vehicle of a given make/model is the same for all vehicle owners/drivers and is not dependent on their driving record. SGI does have an associated program called the Safe Driver Recognition program (SDR). Drivers are assigned demerit points (on a cumulative scale) when they are involved in various types of traffic offences that result in convictions. For criminal-code convictions, a driver falls to the bottom of the scale (to a rating of -20) and is sent a bill for $500, which must be paid before he or she can do business again with SGI (e.g., vehicle registration, driver license renewal). For each such offence, a driver must pay the $500. The Saskatchewan ignition interlock program provides an incentive for people to get a provisional driver’s license after serving about a third of their suspension term. Drivers who do not install an interlock are required to serve a full term. At this time, no reductions in basic premiums or the $500 penalty fee are offered to drivers who enter the interlock program.

In British Columbia, the public Insurance Company of British Columbia (ICBC) covers both personal injury claims and property damage claims. A DWI (driving-while-intoxicated) conviction results in 10 penalty points (about the same as three speeding tickets). The rate structure considers penalty points, so the person would pay a higher premium when he or she is relicensed.

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Benefit of Offering Interlock Discounts

In its 2001 report on alcohol ignition interlock devices, ICADTS noted that evidence spanning nearly 10 years by eight or more research groups in the United States and Canada pointed toward 40% to 95% reductions in recidivism while the interlock programs were in effect relative to DWI rates of matched groups of offenders who were simply suspended and should not be driving at all (Marques et al, 2001). The US states and Canadian provinces studied were Ohio (Elliot and Morse, 1993); Oregon (Jones, 1993); North Carolina (Popkin et al, 1988); Alberta (Weinrath, 1997; Voas et al, 1999); West Virginia (Tippetts and Voas, 1998); Maryland (Beck et al, 1999); and Québec (Vézina and Dussault, 2001).

In most cases, the interlock programs ran for about 6 to 18 months and included a mix of first and multiple DWI offenders. Most research studies found that the effect of the interlock program on reducing DWI rates did not extend beyond the end of the program. The outcome of these studies showed that many people who avoided DWI arrests while the interlock was installed went back to their old ways after the program ended. Repeat offense rates by drivers after the interlock had been removed were similar to rates for those who never had an interlock and whose licenses were suspended. Nonetheless, when adding together the on-interlock and after-interlock DWI rates, the interlock programs still have a significant net advantage (Marques et al, 2001).

One of the studies mentioned above (Beck et al, 1999) should have particular influence on an insurance company’s decision to offer a cost reduction to a driver while the interlock is installed. The study was funded by the Insurance Institute for Highway Safety (IIHS), a highly respected research group funded by the US insurance industry. The research was conducted by the University of Maryland to find out if ignition interlock devices reduced the recidivism rate of repeat violators of drinking-and-driving laws. For the study, university researchers used a sample group of 1380 repeat offenders of drinking-and-driving laws who had received treatment and were eligible to have their driving privileges reinstated. They randomly assigned members of the group to either a continuing treatment program or a treatment and interlock program. Offenders participating in the interlock program received restricted licences allowing them to drive interlock-equipped vehicles only.

Results reported a year later revealed that only 2.4% of those repeat offenders assigned to the interlock program had committed an alcohol-related traffic violation. The violation rate for the control group was 6.7%. Kenneth Beck, one of the researchers and a professor of health education at the University of Maryland, reported, “This was a statistically significant difference and indicated that being in an interlock program reduced the risk of an alcohol traffic violation within the first year by about 65%.” (IIHS, 1997).
Existing Insurance Incentives for Installing the Interlock

Examples of insurance company incentives for installing interlock devices are found in North America and Europe.

In Quebec, Canada, one private company, La Capitale assurances générales inc (La Capitale General Insurance Inc), offers a 100% waiver of the premium surcharge to its property damage customers convicted of their first impaired-driving offense, if they participate in the interlock program for at least 12 months. For existing clients who are convicted of a second impaired-driving offense, a 50% waiver is offered. La Capitale’s offer has been in place since 1998 (shortly after the commencement of Quebec’s Ignition Interlock Program); however, fewer than 100 people have taken advantage of it. Because of the small number of drivers participating in the program, no evaluation of its effectiveness has been conducted.8

In Sweden, a 50 percent reduction in the part of the insurance premium that covers the vehicle is offered by one insurance company to drivers who install an interlock device (Lonegren, 2004).

A private insurance company in West Virginia in the United States offered a program to reduce rates if an interlock was installed, but then abandoned it when it did not prove popular among offenders. It is not clear if the program was well publicized and rejected, or just not well known (Marques et al, 2001).

What Could the Insurance Industry Do and What Are the Impediments

Interlocks might seem like a win-win situation for the insurance industry, their customers, and for traffic safety. Interlocks have been proven to reduce recidivism effectively while they are installed on offenders’ vehicles; consequently, it might make sense for an insurance company to offer a reduced rate to any customer who received a DUI and then installed the device. Usually, a DUI offender’s insurance premium is significantly increased. If a company would offer a reduction, at least as large as the cost of the interlock, it could serve as a major incentive for DUI offenders to install the interlock. Therefore, many more DUI offenders would probably opt for the interlock and therefore become legally licensed drivers with appropriate automobile insurance. This could be made very compelling if the insurance was stipulated to be in effect only when driving an interlock vehicle.

Greater use of the interlock might be expected to result in fewer alcohol-related crashes, fewer injuries, and fewer fatalities. However, we also know that more total driving will likely lead to more crashes even though those crashes would not be costly alcohol crashes. Fewer alcohol crashes might result in lower claims and lower costs to the industry provided overall crash rates, including alcohol-related and non-alcohol-related crashes, did not increase beyond the expected rate for all drivers.

Before insurance companies take this kind of action, several issues need to be considered. For the last 5 years, auto insurance companies on average have not made profits on the policies they have written. In other words, for every dollar in premium collected, they have paid out $1.04 in expenses. In general, most auto insurance companies do not make an underwriting profit; instead, they rely on profits from investments that follow from the influx of premium payments (A.M. Best, 2002). If rates are reduced, then insurance companies will have less money to invest, and therefore, their profits will be lower. Skeptics might say that insurance companies are not really interested in reducing crashes, because fewer crashes mean lower costs that result in lower insurance rates. Lower rates mean less money to invest.

In the United States, the rates that insurance companies charge their customers are regulated, to varying degrees, by state insurance commissions. In some states, the rates are actually set by the state. It is possible that insurance regulators or even state legislatures could impose requirements upon insurers to offer rate adjustment for the installation of interlock devices. There have been instances when regulators have required adjustments, such as with the discount offered to seniors who take driver education.

The state has considerable leverage over this problem. Installation of interlock devices could also be required as a condition for a driver to be offered a policy under a state’s “assigned risk pool” program.

The overall crash likelihood issue also needs to be resolved. In a study conducted in Quebec (Vézina, 2002), it was found that while people in the interlock program had fewer alcohol-related crashes, they had more total collisions than those who were not in the interlock program but simply under license suspension. The increased risk of collision (other than alcohol related) was probably due to increased exposure or total overall driving. This occurs because those who went into the interlock program regained their licenses earlier than those who did not. In addition, the legally licensed drivers in the interlock program probably drove more often than those who were not licensed. Even though many of the unlicensed drivers continued to drive, studies have shown that they drive less, and when they do drive, they do so more safely (Voas, 1994). The risk of unlicensed drivers has been studied over the years. A recent review in the United Kingdom examined data from three police forces on crashes involving unlicensed drivers (it was not possible to break the data down to identify drivers disqualified for drink-driving). Breath-test results showed that 17% of disqualified drivers who were breath tested after an accident were positive compared with the national average for all post-crash tests of 3%.  

The question then becomes: Is it expected that reduction of alcohol-related collisions has an overall benefit despite a possible increase in the overall collision rate resulting from increased exposure? The authors of the Quebec study did not have the individual exposure data necessary to

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9 McMahon, Kate, Divisional Manager, Road Safety Strategy Division, Department of Transport, Great Britain, personal communication on January 6, 2005
study that outcome. However, on a miles-driven basis, the authors believe that the number of collisions is lower for drivers in the interlock program compared to drivers not in the program.  

A recent series of evaluations of various California ignition interlock device programs was completed in 2004 (see DeYoung et al, this volume). The studies evaluated interlock programs imposed by judges as part of court proceedings and contrasted those with interlock programs imposed through an administrative process. The outcomes varied depending on the type of program and the type of offender. It should be noted that, in the California report, interlocks may have been required but not installed, and when installed, they were usually in place for a brief portion of the total comparison period, usually the first 6-12 months of the 3-5 year comparisons.

For the judicial program:

- Second offenders had 13% fewer DUI incidents (alcohol-related traffic convictions or crashes) and 19% fewer crashes overall.

- DUI suspension violators had 24% to 42% fewer overall crashes, but the program did not reduce alcohol-related crashes or convictions.

- For first offenders with a high arrest BAC (blood alcohol concentration), the program did not reduce crashes or convictions.

For the administrative program:

- All offenders in the administrative program had 18% lower rates of DUI convictions and 32% lower rates of DUI incidents. However, the overall crash rate was 84% higher.

- Second DUI offenders had 41% fewer DUI incidents but 2.3 times as many overall crashes.

Thus, these evaluations indicate that the interlock programs were effective in reducing alcohol-related crashes and convictions for some offenders. For the most part, they increased overall crash rates. It should be noted, however, that while overall crash rates were higher than for offenders who were not on the interlock (and presumably unlicensed), the crash rate was still slightly lower than that of average California drivers (DeYoung et al, 2005).

The bottom line for insurers, both public and private, is the overall effect on risk for drivers in the interlock program. Based on the California experience, it might be possible for insurance companies to provide premium relief for interlock use by their customers who become DUI offenders, providing they also fall in that group of drivers who have fewer DUI convictions and incidents, and also have fewer overall crashes. If it can be shown that the overall risk and subsequent claims are reduced for

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drivers in the interlock program, then financial incentives would be warranted to encourage drivers to enter the interlock program.

References


Section 3: Program Status and Development
Alcolock Developments in the European Union

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Introduction

The legal limit for drinking and driving in the current 15 member states of the European Union\textsuperscript{11} varies from a BAC of 0.2 grams pure alcohol per liter blood in Sweden (20 mg/dl or .02%) to more than 0.5 g/l (50 mg/dl or .05%) in most countries up to 0.8 g/l (80 mg/dl or .08%) in the Irish Republic and the United Kingdom.

The European Transport Safety Council (ETSC, 2003) estimated that transport crashes in the European Union killed 39,200 citizens in 2001, caused more than 3.3 million casualties and cost more than 180 billion euros. Yet another report of the ETSC (2001) states that despite “... a small percentage of drivers drive with excess of alcohol, they are responsible for at least 20 per cent of the serious and fatal traffic injuries in the EU ....”

There is a positive correlation between per capita consumption of alcohol and drinking and driving (Mann and Anglin, 1990). Thirteen of 15 European member states have a place in the 2001 world top 20 of per capita consumption expressed in liters of pure alcohol; by contrast, Australia is 23\textsuperscript{rd}; the United States, 26\textsuperscript{th}; and Canada, 27\textsuperscript{th}. Only two European Union member states, Finland (24\textsuperscript{th}) and Sweden (35\textsuperscript{th}), have lower rankings (Commission for Distilled Spirits, 2002).

No representative epidemiological data are available on the prevalence of drinking and driving in the European Union. Drink-driving roadside surveys are organized at the discretion of the member states; consequently, the results are not comparable due to methodological differences. Even when the data are gathered in a fairly comparable way (eg, Belgium and the Netherlands; for a comparison of both countries, see Vanlaar, 2002), the results can differ significantly, reflecting different enforcement levels, cultures, and drinking habits.

Finally, based on self-reporting figures—which are certainly subject to social desirability—we know that almost 4\% of European drivers report that they have driven in the last month at least once a week with alcohol levels exceeding the legal limit (SARTRE 2, 1998).

A consensus exists among researchers that an alcohol ignition interlock device (alcolock) is a powerful tool to combat the threats of drinking and driving on public safety, at least while installed. “Breath alcohol ignition interlock devices, when embedded in a comprehensive monitoring and service program, lead to 40\% to 95\% reductions in the rate of repeat DWI

\textsuperscript{11} Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Republic of Ireland, Spain, Sweden, and United Kingdom.
offences of convicted DWI offenders (Marques et al, 2001)." The immense value of this device regarding incapacitation (Beirness and Simpson, 2003) and the far-reaching impact it could have on traffic safety—if higher participation rates can be achieved—have recently been confirmed in the proceedings of an international Symposium on Enhancing the Effectiveness of Alcohol Ignition Interlock Programs.

Inspired by convincing findings such as these and by the recommendations based on a European feasibility study (Bax et al, 2001), the European Commission’s Road Safety Action Programme explicitly refers to behavioral research on alcolocks, required to enhance wide-scale implementation of this measure. Examining driver impairment detection devices like alcolocks is set as one of the priorities to reach the goal of halving the number of road deaths by 2010 (Commission of the European Communities, 2003). Because the risk exposure factors are much greater in the accession countries, the need for drastic measures like legal implementation of alcolocks becomes even more meaningful when taking into account this enlargement of the European Union in 2004.

In parallel with the European Road Safety Action Programme, a call for proposals in the field of transport (DG TREN/SUB/01-2003) was launched in the spring of 2003 to promote the objectives of the common transport policy. This call referred in particular to a project on trials with alcolocks.

The Belgian Road Safety Institute (IBSR) took the initiative to form a consortium of European institutes that were interested in participating in a qualitative field trial. The consortium comprises Belgium (IBSR as coordinator), Germany (BAST, Federal Highway Research Institute), the Netherlands (SWOV, Institute for Road Safety Research), Norway (TØI, Institute of Transport Economics), and Spain (University of Valladolid).

Besides this coordinated field trial, borne by a consortium of four European member states and Norway, there are some other valuable initiatives in Europe. The most well known is the Swedish program, which has recently been expanded to cover all of Sweden, based on the promising findings of the pilot study (Bjerre, 2003). Other countries like Finland, the United Kingdom, and the Netherlands also are preparing legal implementation of an alcolock program.

The European Qualitative Field Trial

In September 2003, the European Commission officially informed the consortium that the proposal submitted in response to the call in the field of transport was approved. The kick-off meeting of this European field trial began in the spring of 2004. All activities will be finalized over 2 years.

General and specific objectives of the European field trial

The general objective of the field trial is to contribute to a reduction of the number of victims on European roads. This will be done by preparing and facilitating legal implementation of alcolocks in the European Union and

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12 Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, and Czech Republic.
through research on the impact on drivers whose vehicles are equipped with an alcolock. The specific objectives of the field trial follow:

- To study the perceptions of four groups of drivers (public transport drivers, goods transport drivers, recidivists, and alcohol dependent patients [DSM-IV criteria]) and of related subjects of these groups (passengers for the first group; company owners for the second group; relatives—persons living together with the driver—for the third and fourth groups) toward driving with an alcolock. More precisely, the purpose is to study their ideas, beliefs, attitudes, expectations, problems, and so forth (ie, the psychological impact).

- To study the impact of alcolocks on the relation between drivers of these four groups and their related subjects (ie, the sociological impact).

- To study the impact of alcolocks on the drinking, driving, and drink-driving habits of the four categories of drivers (ie, the behavioural impact).

- To study practical consequences on these drivers and their related subjects (eg, the practical consequences of safely managing running retests; practical consequences of the place in the vehicle where the alcolock is installed; the practical consequences after a failure; and practical consequences of an alcolock in a family car with different drivers from the same family).

- To form a solid basis for theoretical and practical input for larger quantitative experiments on efficiency (pilots in different European member states) that could be a logical continuation of this qualitative approach as a final step before legal implementation.

Methodology

The in-depth qualitative field trial will comprise 150 drivers, divided into the following four target groups:

- 60 public transport drivers (30 in a Spanish trial and 30 in a Norwegian trial).

- 30 goods transport drivers in a German trial.

- 30 recidivists in a Belgian trial.

- 30 alcohol-dependent patients (DSM-IV criteria) in a Belgian trial.

Furthermore, the following related subjects will be included in the study:

- Passengers of public transport drivers.

- Goods transport owners.
- Relatives (ie, people living together with the subject) of recidivists and alcohol-dependent patients.

Because little is known about the psychological and sociological impact of alcolock programs, we want to keep any option open when studying the research subjects. This is typically realised in a small-scale qualitative in-depth research project. Furthermore, such a trial will allow the collection of exploratory empirical field data (ie, real-life experiences with alcolocks in European countries). This is a necessary and logical step towards legal implementation because the expertise with alcolocks in other parts of the world may be very important to Europe, but it still needs to be translated into the European context.

**Innovation**

In some parts of the world (Australia, Canada, Sweden, and the United States), alcolocks are used on a fairly large scale. As illustrated in the introduction, several years of experience show that alcolock programs have great potential in reducing drinking and driving, and as a consequence, alcohol-related accidents. There are two main reasons why this proposal could lead to new approaches and practices in Europe.

In Europe, until now only Sweden has adapted its legal system to allow driving with an alcolock as an alternative to driving license revocation. In other countries like Belgium, Finland, the Netherlands, and the United Kingdom, action has been undertaken to learn more about this promising measure, but these are isolated cases. A European field trial would overcome the potential problem of isolated findings and lead to new approaches and practices in Europe.

Furthermore, only one research project with a European dimension has been carried out until now (Bax et al, 2001). This European project consisted mainly of a literature study but not of a field trial, which would lead to new approaches and practices.

**Cost-effectiveness**

A recent case-control study in the Netherlands (Mathijssen et al, 2002) concluded that the (serious) injury risk of drivers with a BAC higher than 1.3 g/l (130 mg/dl or .13%) is approximately 45 to 50 times higher than the injury risk of sober drivers. In the Netherlands, drivers with a BAC higher than 1.3 g/l account for more than 20% of all (serious) road injuries, while constituting only 0.3% of all drivers. It is assumed that the situation in the whole European Union is not much different from the Dutch situation. The Dutch risk rates correspond with the results of previous research in the United States. Simpson and Mayhew (1991) concluded that the fatality risk of drivers with a BAC higher than 1.5 g/l (150 mg/dl or .15%) is approximately 200 times higher than the fatality risk of sober drivers.

Recent research in Canada and the United States indicates that alcolocks reduce recidivism rates by an average of 65% (Beirness, 2001). If the proposed alcolock field trial results in large-scale implementation of
alcolock programs in the European Union countries, the cost per 1000 participants would be approximately 2 million euros. If the program participants consist of high BAC drivers and the alcolock reduces their recidivism rate by 50%, the annual number of road fatalities would decrease by at least 5 per 1000 participants. European Union-wide alcolock implementation would probably save several hundreds of road fatalities and several thousands of serious road injuries per annum. Even when applying the rather low 1 million euros test per road fatality, large-scale alcolock implementation for high BAC drivers would be cost-beneficial.

With respect to professional drivers, alcolock implementation may not be cost-beneficial in a purely economic sense, but it may raise the subjective safety of, for instance, bus or train passengers.

Other European Union Initiatives

Before the start of the European Union feasibility study regarding alcolock implementation in the member states, Sweden already had started its own alcolock implementation experiment. The European Union feasibility study resulted not only in the qualitative European Union field trial mentioned above, but also in several other alcolock implementation initiatives:

- In September 2003, the Netherlands Ministry of Transport decided to implement an alcolock program as soon as possible, probably late 2005 or early 2006.
- In December 2003, a working group of the Finnish Ministry of Transport presented a proposal for a national alcolocks field trial, which will start sometime in 2005.
- In 2004, the start of a 30-month United Kingdom field trial commenced, investigating the social impact of alcolocks on users and their families.
- In November 2003, a start was made with the development of a uniform technical European Union standard for alcolocks.

Little is known about the United Kingdom’s intentions; therefore, only the Swedish experiment, the Dutch and Finnish initiatives, and the development of a uniform technical standard will be discussed.

The Swedish experiment

In 1999, Sweden started a voluntary pilot program for car drivers in three counties. Target groups were first and multiple DUI offenders, including alcohol-dependent drivers. Part of the program was a 3-month medical examination of alcohol dependency. Preliminary evaluation findings (Bjerre, 2003) from March 1999 to June 2002 showed impressive reductions of alcohol consumption and drink-driving recidivism among alcolock users. The annual frequency of DUI offences within the treated group was reduced from 4.7% to zero. In a matched control group, a reduction from
3.8 to 1.6% was found. The difference between both groups was not statistically significant. This was partly due to the relatively small number of subjects in both the alcolock group (n=311) and the matched control group (n=625), but also to very strong self-selection of alcolock users. Only 12% of eligible drivers applied for the program, and 5% of those applicants was rejected. During the program, 35% of the participants was dismissed and another 4% quit. Therefore, the Swedish evaluation findings would raise questions about the average 65% DUI reduction rate claimed by Canadian and American alcolock programs (Beirness, 2001) if similar exclusions were made.

Nevertheless, the Swedish evaluation results indicate that alcolock programs may substantially reduce drink-driving recidivism and alcohol-related crashes. Beginning in October 2003, the Swedish alcolock program was extended to all counties and all driver categories.

Together with the pilot program for DUI offenders, Sweden also started a program of commercial/preventive alcolock use. In late 2003, approximately 2000 allocks were installed in (school) buses, taxis, heavy trucks, and driving-school vehicles. Beginning on 1 January 2004, heavy trucks working for the Swedish National Road Administration (Vägverket) were required to have an alcolock installed. Swedish communities plan to follow this example for all public transportation vehicles. This means that over the next few years, more than 20 000 alcolocks will be installed in commercial vehicles in Sweden.

**The Dutch implementation initiative**

In September 2003, the Netherlands Ministry of Transport decided to implement an alcolock program as soon as possible. The target group consisted of DUI offenders who underwent a medical/psychiatric assessment and were declared “fit to drive.” The target group forms approximately 1% of all arrested DUI offenders in the Netherlands. In 2002, the police apprehended 38 500 DUI offenders; 4000 of these were multiple recidivists or had a BAC higher than 1.8 g/l (180 mg/dl or .18%). These hardcore drinking drivers had to undergo a medical/psychiatric assessment. The verdict in 90% of the assessments was “unfit to drive” and resulted in license revocation. For the remaining 10%, the verdict was “fit to drive” and resulted in a regranting of the license after a suspension period that, in most cases, was not longer than 6 months.

The alcolock program will be mandatory under administrative law and will span 2 years with the possibility of a 6-month extension. Two years after the start of alcolock implementation, the size of the target group will stabilize at approximately 800 subjects. The program cost per installed alcolock is estimated to be 2200 euros, two-thirds of which will be borne by the participants and one-third by the Ministry of Transport. The estimated benefit of the alcolock program is an annual reduction of four to five road fatalities, at an annual program cost of 0.9 million euros. The estimated reduction of road fatalities is based on a 65% reduced crash rate for the alcolock users, but even at a 25% reduced crash rate, the alcolock program would still be cost-beneficial. Future extension to alcohol-
dependent drivers and DUI offenders with BACs between 1.3 and 1.8 g/l, who presently have to attend a 3-day driver improvement program, might increase the road safety benefits by a factor of 20.

The preliminary program contains several features aimed at reducing post-program recidivism:

- Integration of driver improvement elements for all participants, and counseling for drivers who exceed a predetermined number of failed tests.
- A relatively long 2-year standard duration of the program.
- The possibility of a 6-month extension of the program.
- The possibility of mandatory re-entering the program after 2.5 years, following a new assessment of fitness-to-drive.

The Finnish alcolock trial

The report of the Finnish Working Group on Ignition Interlocks (2003) proposed a 3-year trial of alcolock implementation for DWI offenders. The proposed target group consisted of drink-driving offenders whose driver’s licenses normally would have been suspended. Voluntary alcolock program participation would make the suspension probationary. The period of program participation will be equal to the probationary suspension period, with a minimum of 1 year. The typical suspension period in Finland is 6 to 18 months. Drug users and drivers suspended for other reasons than drinking and driving will be excluded. Furthermore, the conditions of the trial require that alcolock users participate in an alcohol-dependency program and, after 6 months, undergo the alcohol dependency assessment; alcohol-dependent drivers will then have to leave the program. Medical surveillance covers the whole program period, and participants have to reduce their alcohol consumption to complete the program successfully. Participants who violate the rules of the alcolock program (eg, by operating a non-alcolock-installed car) also will be removed from the program. The working group’s report suggests that participants should pay the cost of the alcolock program, although its members were not unanimous on this.

The report also discusses the possibility of alcolock implementation for professional drivers, but so far leaves the initiative to market forces.

After the report has been commented on by all relevant bodies and any necessary adjustments have been made, it will be sent to Parliament.

Development of a uniform technical standard

On the initiative of the German Electro Technical Committee DKE, the European Committee for Electro Technical Standardization CENELEC has charged a task force with the development of a European Standard specifying requirements for construction, test methods, and performance and safety requirements for alcolocks. The European Standard mainly will
be directed to test laboratories and alcolock manufacturers; it also may be referenced as a requirement in European and/or national legislation or regulations. The task force consisting of representatives of the national electro technical committees of Belgium, Germany, Spain, Sweden, and the Netherlands held its first meeting in November 2003. The target date for voting on the European Standard as proposed by the task force is 1 August 2005.

Conclusion

Now that alcolocks have come of age, more and more concrete initiatives are being taken in the European Union. Apart from the Swedish exceptional example (also regarding the timing of implementation in comparison with other European Union member states as to the different program approach in comparison with the rest of the world), a European consortium has been constituted to conduct several European small-scale field trials. Initiatives also are being taken in Finland, the United Kingdom, and the Netherlands. Finally, representatives of different member states are working together to establish a European uniform technical standard.

One of the reasons for these recent developments in the European Union is the vast impact of drinking and driving on public safety. Several studies indicate drinking and driving is one of the main problems to be tackled to decrease the number of accidents, fatalities, and injuries. Even though each indicator used in these studies can be criticized, the combined picture of accident figures, per capita consumption, isolated ad hoc results of drink-driving roadside surveys, and self-reporting figures have led to the belief that drinking and driving is a major road safety problem in the European Union.

Now that this problem is widely recognized, the European Union and its member states are stimulating research on new extreme measures to combat this problem. The classical approaches that have been attempted so far, like police enforcement and publicity campaigns apparently, do not suffice. Because the evidence supporting the implementation of alcolock programs has become very convincing, initiatives are being taken accordingly.

However, because all the initiatives are still in preparation (except for the Swedish one), it is too early to indicate limitations of the chosen approaches. The main objective of the European Union field trials and the Dutch experiment actually is to explore advantages and disadvantages of different approaches. Many years of international experience with alcolocks have led to expertise and best practices, which will be of immense value to the European initiatives.

One of the greatest challenges will be to translate the international expertise to the European context without losing balance between the European identity on the one hand and the introduction of (almost all) non-European research findings on the other. This underlines the importance of a gradual approach of field trials, which will create opportunities for such a translation. If these trials are run efficiently, they could
soon lead to legal implementation of programs comprising the best parts of alcolock programs all over the world that have already been evaluated.

For a successful alcolock implementation, at least three main conditions must be met, irrespective of its cultural and geographical context. Otherwise, introducing alcolocks will lead to unsatisfying results. First, some minimal technical requirements of the device must be met to ensure that the device works correctly regarding accuracy, liability, and prevention of cheating. The objective of creating a European technical standard coincides with these requirements.

Second, the use of the alcolock device will have to be embedded in a well-designed monitoring and service program. It is the responsibility of the consortia bearing the different European trials to ensure that European programs combine the best aspects of the existing programs with features that best fit the European legislative systems and culture.

Finally, it is clear that without high participation rates, this measure will never be optimal nor fulfil our high expectations. Several evaluation studies thought this to be one of the major challenges; therefore, from the very start, one of the main responsibilities of the consortia will be to find the best solution to this problem.

If the above-mentioned conditions are met, a gradual approach eventually could produce satisfying results, which ultimately should lead to a decrease of fatalities and injuries in Europe. Moreover, the European experiences could in turn lead to interesting research findings that are applicable in the rest of the world.
References


Ontario’s Ignition Interlock Program – Overview and Status for ICADTS 2004

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Introduction

History

The objective of the ignition interlock program is to require offenders to separate drinking from driving. The social and economic costs of drinking and driving have been estimated at $2.2 billion per year. During the 1990s, the Ministry of Transportation of Ontario (MTO) introduced numerous initiatives to combat drinking and driving with some of the toughest laws and programs in North America. Although improvements had already been made, there were still approximately 16,000 convictions in Ontario for drinking and driving in 2002.

On 21 December 2000, Private Member’s Bill 131, Highway Traffic Amendment Act (Ignition Interlock Device), 2000, introduced by MPP Garfield Dunlop, received Royal Assent with solid all-party and stakeholder support. The bill provided for an ignition interlock program for convicted impaired drivers in Ontario. Enabling legislation for the ignition interlock program, which passed with all-party support, took effect on 23 December 2001. A driver convicted of an impaired-driving offence, committed on or after this date, could have their driving privileges reinstated on condition that they only drive a vehicle with an ignition interlock device installed or stay off the road. Ontario’s ignition interlock program applies to all drivers who have been convicted of impaired driving under sections 253, 254, or 255 of the Criminal Code of Canada. The first conviction under the new law occurred on 28 December 2001, and to date, more than 32,000 convicted impaired drivers will be subject to the new program when their licences are re-instated.

Ontario’s drinking and driving programs

In Ontario, drivers convicted of an impaired-driving offence are subject to a number of programs in addition to the ignition interlock. In November 1996, Ontario instituted the Administrative Drivers Licence Suspension (ADLS) for drivers who provide a sample over the legal limit (.08 g/dl) or who refuse a breath test. The ADLS is an immediate 90-day administrative licence suspension separate and distinct from any criminal charges a driver faces in court. Programs that suspend driver’s licences based on an administrative determination have demonstrated their effectiveness as a deterrent, not only in Ontario (Mann et al, 2000, 2002), but also in other Canadian jurisdictions (Beirness et al, 1997) and in the United States (Ross and Gilliland, 1991). With respect to suspensions, once convicted, tough suspension periods remain in place for convicted impaired drivers as follows:
- One year on a first conviction.
- Three years on a second conviction.
- Life on a third conviction, which may be reduced to 10 years if certain conditions are met.
- Life on a fourth conviction with no possibility of ever having an Ontario driver’s licence again.

Since September 1998, as a condition of licence reinstatement, convicted impaired drivers must complete the Remedial Measures Program (“Back on Track”) provided in Ontario by the Centre for Addiction and Mental Health. The Program is composed of three components: an alcohol assessment, an education or a treatment program, and a follow-up interview. The components are detailed as follows:

- **Assessment**: Determines the extent of the drink-driving problem and whether an education or a treatment program is most appropriate.

- **Education or treatment program**: Driver must successfully complete the appropriate program aimed at preventing drinking and driving. These programs focus on how alcohol affects driving performance, the consequences of impaired driving, and ways to avoid drinking and driving.

- **Follow-up interview**: Takes place 6 months after the completion of the education or treatment program to revisit the skills obtained and goals set.

Drivers must complete all three components of the “Back on Track” program before the end of their suspension period to get their licence back. In addition, they must satisfy all other requirements for licence reinstatement. Research has shown that rehabilitation of convicted impaired drivers has been generally effective in reducing recidivism (eg, Wells-Parker et al, 1995).

**Ontario’s ignition interlock program**

After serving the mandatory period of licence suspension (1 year for a first offence, 3 years for a second offence, and a minimum of 10 years for a third offence) and completing the Remedial Measures Program, a convicted impaired driver will have his or her driver’s licence reinstated with an interlock ignition condition for a minimum period. The ignition interlock condition will require that an interlock device is installed in any vehicle driven by the offender and is a mandatory condition of the reinstated licence. However, an offender may choose to sit out the interlock period. The condition periods correspond with the conviction order as follows:

- First-time offenders will have an ignition interlock condition on their licence for a minimum of 1 year.
Second-time offenders will have an interlock ignition condition on their licence for a minimum of 3 years.

Third-time offenders will be suspended for life, but they can apply for reinstatement of their driver’s after completing 10 years of their suspension periods. If they are reinstated, the ignition interlock condition will be permanent.

The program also features penalties for non-compliance with the licence condition. Drivers convicted of driving without an ignition interlock device or for tampering with the device will face fines under the Highway Traffic Act as follows:

- $200 – $20 000 for commercial vehicles
- $200 – $1000 for other motor vehicles

Ignition interlock violations for tampering or driving without a device will be reported to the MTO. This includes the Highway Traffic Act convictions and program violation reports (tampering/failure to attend maintenance appointment) from the service provider. Program violations will affect the amount of time the condition remains on the licence. For example, the condition will remain on the licence of a first-time offender for an additional year from the date of a tampering offence. Vehicle owners who knowingly allow a person with an ignition interlock condition to drive their vehicles may also be convicted under the Highway Traffic Act. In addition, it is also an offence for a person to knowingly lend his or her vehicle to someone who requires an ignition interlock device to drive. The fines outlined above would apply. The consequences associated with a conviction for impaired driving in Ontario are outlined in Table 1.

Table 1. Summary of Offences and Penalties

<table>
<thead>
<tr>
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<th>Consequences under the Highway Traffic Act</th>
<th>Minimum Penalties under the Criminal Code</th>
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<tbody>
<tr>
<td><strong>First Offence</strong></td>
<td>• 1-year licence suspension</td>
<td>• 1 year driving prohibition</td>
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<tr>
<td></td>
<td>• Remedial measures requirement</td>
<td>• $600 fine</td>
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<tr>
<td></td>
<td>• Minimum 1-year ignition interlock condition upon reinstatement</td>
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<tr>
<td><strong>Second Offence</strong></td>
<td>• 3-year licence suspension</td>
<td>• 2-year driving prohibition</td>
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<td></td>
<td>• Remedial measures requirement</td>
<td>• 14-day jail sentence</td>
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<td></td>
<td>• Minimum 3 years ignition interlock condition upon reinstatement</td>
<td></td>
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<tr>
<td><strong>Third Offence</strong></td>
<td>• Lifetime licence suspension (reducible to 10 years if remedial measures requirement and other conditions met)</td>
<td>• 3-year driving prohibition</td>
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<tr>
<td></td>
<td>• Ignition interlock condition for life if suspension reduced</td>
<td>• 90-day jail sentence</td>
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<tr>
<td><strong>Fourth and Subsequent Offences</strong></td>
<td>• Lifetime licence suspension</td>
<td>• Same as third offence</td>
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<tr>
<td></td>
<td>• No possibility of reinstatement</td>
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</table>
Key Program Elements

Alternative service delivery concept

An alternative service delivery concept was chosen in the program design phase, and a contract was awarded to Guardian Interlock Systems Corp. of Mississauga, Ontario, a world leader in interlock technology and program management, to deliver the interlock program on behalf of the MTO. In turn, Guardian has subcontracted with Standard Auto Glass (Belron Int.) to provide the installation, inspection, servicing, calibration, and de-installation of interlock devices. Guardian maintains all records of installation as well as all data downloaded from the data logger each time the device is serviced. These data are transferred to the MTO at least once each year after the convicted impaired driver has completed the program.

The ignition interlock service provider was fully operational on 28 December 2002, with 6 service centres, eventually expanding to the current 15 ignition interlock service centres. Guardian, again through their subcontractor Standard Auto Glass, has established centres in Ottawa, Toronto (Scarborough), London, Sudbury, Thunder Bay, Chatham, St. Catharines, Barrie, Peterborough, Kingston, Windsor, Etobicoke, Burlington, and Kitchener. Guardian also has a service centre in Mississauga. A map of Ontario with the locations illustrated is shown in Figure 1. The option of direct delivery of ignition interlock service by the government was not seen as a realistic option as the private sector holds the expertise in this area. Other Canadian provinces have employed a similar business model.

Time-based vs. behavioural-based approach

Initially, in the early phases of program design, there was a question of instituting a time-based versus a behavioural-based approach. The philosophy of a time-based approach is that providing there are no program violations, the Registrar will allow for the removal of the condition when the minimum time established in the legislation expires. It does not take into consideration the drink-driving behaviour (e.g., failed starts) recorded by the ignition interlock device. A behavioural-based approach would include all the elements of a time-based approach, but also include behavioural criteria in the MTO’s decision on whether to remove the condition based on readings from the device. For example, criteria could be specified in the regulations that if an offender had a certain number of readings higher than 0.08 BAC (blood alcohol concentration) for a specified number of times in a given period, the condition would not be removed.

A time-based approach for removal of the ignition interlock condition was adopted in program design. This means that if the convicted impaired driver’s record shows any convictions for tampering with or driving without the device or any reports by the ignition interlock service provider of any tampering and non-attendance for maintenance appointments, the condition removal date will be deferred. Therefore, the criterion for removal of ignition interlock condition is that offenders must have a
minimum period of 1 year for first-time offenders or 3 years for second-time offenders with no convictions or program violations. This rationale does not apply to third-time offenders, as their ignition interlock condition is permanent.

In essence, at the time of implementation of the program, there was no strong research to support policy decisions around using BAC data (Beirness, 2001; Marques et al., 2001). Therefore, a time-based monitoring was instituted. An outline of the benefits expected to result from this decision follows:

- Simple and more cost-effective to administer.
- An objective approach that meets the intent of the legislation.
- Consistent for offenders without device installed.
- Less potential for challenges from legal or privacy concerns.
- Maximum participation encouraged.
- Allows time for further study of drinking patterns.

The ministry chose a walk-before-run approach but committed to examining BAC patterns of offenders in the program during the first few years with a view to revisiting the approach with the benefit of data. In that vein, a program evaluation methodology has been developed (to be executed in 2006) that will study anonymised BAC data to determine if changes to the monitoring approach should be considered.

**Mandatory suspension/interlock periods**

The Ontario interlock program differs considerably from those in other jurisdictions in that the Ontario program provides for a fixed period of “hard” (mandatory) licence suspension followed by a fixed period of ignition interlock participation. For example, first-time convicted impaired drivers must serve a full 1-year licence suspension before being eligible for the interlock program, a second-time conviction would mean a 3-year licence suspension, and a third-time conviction would mean a 10-year licence suspension. The interlock condition is then applicable for an additional 1-year, 3-year or lifetime period, respectively, following licence reinstatement. Other Canadian jurisdictions allow convicted impaired drivers the opportunity to reduce the period of licence suspension to match the reduction in the federal driving prohibition allowed by section 259 of the *Criminal Code of Canada* if an ignition interlock is installed. This reduction would be 3 months for a first-time offence, 6 months for a second-time offence and 12 months for a subsequent offence. In the other jurisdictions, this reduction in the length of the suspension provides an incentive for offenders to enter the interlock program. By contrast, Ontario requires convicted impaired drivers to serve the entire period of the provincial suspension prior to being eligible for the ignition interlock program. Hence, the period of interlock program participation also is longer.
Other Canadian jurisdictions feature mostly optional participation in the interlock program. In Ontario, upon reinstatement, all convicted impaired drivers will have an ignition interlock condition on their licences, whether they choose to drive or not, that restricts them to an interlock-equipped vehicle for a specified period. Participation is still optional, but the interlock condition on the reinstated licence is not.

**Program Status**

**Participation**

*Percentages.* In Ontario, approximately 16,000 drivers are convicted of impaired driving per year. Since the proclamation of the ignition interlock legislation on 23 December 2001, 32,051 drivers (7,167 drivers in 2002, 12,118 in 2003, and 12,766 as of 31 December 2004) who were convicted of impaired driving in Ontario will be eligible for ignition interlock upon reinstatement. Because an offender must serve a minimum suspension period and complete a Remedial Measures Program before his or her driver’s licence is reinstated, the first offender to have an ignition interlock device installed was shortly after the program implementation date of 28 December 2002. Actual figures reflecting both the eligibility to participate in the ignition interlock program and the actual number of installs to date follow:

- As of 31 December 2004, there were 19,285 offenders who had reached the minimum suspension period of 1 year and were eligible to be reinstated pending completion of the Remedial Measures Program.

- Of these 19,285 drivers, 5,586 have completed the Remedial Measures Program and have been reinstated; therefore, they are eligible to participate in Ontario’s ignition interlock program.

- Of the 5,586 reinstatements, 2,404 offenders have installed an ignition interlock in their vehicles.

Based on these figures and noting that an offender is not eligible to install an interlock until they have been reinstated, the participation rate of 43% based on reinstatement is exemplary. That just under half of the eligible offenders have chosen to participate in the program is a tangible validation of the program design, the service delivery network, and the concept of the mandatory licence condition. In addition, the program has grown steadily since implementation, and this growth is not only expected to continue, but also to improve as the program matures.

The current participation rate based on suspension is approximately 13% considering the 19,285 offenders who have reached the minimum suspension period of 1 year and were eligible to be reinstated pending completion of the Remedial Measures program. Although this would seem average compared to the 10% to 24% rate found in other jurisdictions, the following conditions have led to a slower than expected take-up:
From 1998 to 2002, the average time between offence and conviction is 149 days, resulting in a delay starting the driver's suspension, reinstatement, and ultimately, eligibility for the ignition interlock. This represents an increase of approximately 55% to 60% over the previous 5-year period.

Only drivers who offended and were convicted after the 23 December 2001 date of the legislation proclamation are eligible for the ignition interlock. As a result, there was not an immediate eligible pool of 16 000 offenders per year, but an accumulating number of convictions (7167 drivers in 2002, 12 118 in 2003, and 12 766 as of 31 December 2004) due to the delay between offence and conviction outlined above.

It is expected that the program will reach a higher participation rate of by early 2005–2006 given the factors listed above with 2004–2005 projecting a lower but growing percentage.

Regional distribution of participants. As Canada’s largest jurisdiction by population, Ontario has more than 8.3 million licensed drivers and more than 9.4 million registered motor vehicles. As mentioned previously, Ontario registers more than 16 000 convictions for impaired driving annually. With respect to its roads, there are 16 500 kilometres of highway in the provincial network, which if placed end to end, would span Canada twice. Therefore, it is important that the network of installation centres is both adequate and properly situated to serve the anticipated number of convicted impaired drivers. As outlined under “Alternative Service Delivery Concept,” Guardian, again through their subcontractor Standard Auto Glass, has established centres in Ottawa, Toronto (Scarborough), London, Sudbury, Thunder Bay, Chatham, St. Catharines, Barrie, Peterborough, Kingston, Windsor, Etobicoke, Burlington and Kitchener. Guardian also has a service centre in Mississauga. Given these locations and the 2404 installs to date, a regional representation is provided in Figure 1, outlining the installs by service centre/region:
Figure 1. Ontario Regions and Interlock Installations by Service Centres

Post-implementation issues

During post-implementation, two distinct issues have arisen that have required further program development: convicted impaired drivers requesting exemptions from the ignition interlock requirement and the effects of the ignition interlock requirement on large commercial carriers.

Exemptions. To date, the most common query from the convicted impaired driver has been “Can an exemption be granted?” A number of grounds for exemption have been proffered including medical, exceptional hardship, work-related, and human rights. As there is no exemption to the ignition interlock requirement inherent in the legislation, there is then no related mechanism for granting an exemption in the design of the program.

Commercial carriers. Although the MTO carried out extensive consultation with both public and commercial (fleet) carriers during the program design phase, these groups continued to be concerned as to their obligations with respect to having a convicted impaired driver as an employee. Specifically, these groups were concerned that a driver returning to work could obligate them to install an interlock in a vehicle that might have many users in addition to the driver for whom the device is intended. The multi-driver nature of the vehicle might result in a
number of grievances from employees whose licences do not have an ignition interlock requirement. A comprehensive program of public education that included several presentations to key stakeholders groups assuaged their concerns. Some of the key points articulated follow:

- The cost of the device is incumbent upon the convicted impaired driver and not the employer.
- The employer was under no legal obligation either to accommodate the returning employee or to install the device on a company vehicle.
- The employer needed to have policies (human resource/personnel) in place to deal with the ignition interlock legislation.

To date, there has yet to be a commercial installation of an ignition interlock device related to Ontario’s program.
References


Introduction

Interlock programs were first introduced in Canada as a pilot program in the Province of Alberta in 1989. This program was watched closely by other jurisdictions, and its success has spawned a proliferation of interlock programs across the country. Today the majority of Canadian drivers—and most DWI (driving-while-intoxicated) offenders—have access to an interlock program.

In 1999, as part of a package of amendments to the Criminal Code of Canada dealing with impaired-driving offences, first offenders were given the opportunity to reduce the mandatory minimum period of driving prohibition from 1 year to 3 months by participating in an ignition interlock program. Subsequent amendments extended the reductions in the period of prohibition for repeat offences—from 2 years to 6 months for a second offence and from 3 years to 12 months for subsequent offences—if the offender participated in an interlock program. These legislative amendments gave implicit federal approval and endorsement to interlock programs and spurred the development and expansion of interlock programs for DWI offenders in Canada.

At present, there are interlock programs in six provinces—Alberta, Saskatchewan, Manitoba, Ontario, Quebec, and Newfoundland and Labrador—and the Yukon Territory. All programs are administered by the driver licensing authority in the respective province or territory. Most interlock program participants are volunteers who take advantage of the reduction in the period of driving prohibition and the opportunity to drive legally sooner. However, the proportion of DWI offenders who elect to participate in interlock programs remains relatively low—typically between 10% and 20%. Enhancing the number of participants in interlock programs remains a challenge for every program. In this context, several jurisdictions are either considering or proceeding with legislation that makes participation in the interlock program mandatory, at least for repeat and high-risk offenders.

Examples of Programs

Alberta

As noted previously, Alberta was the first province in Canada to introduce an interlock program. Since its inception, approximately 10,000 DWI offenders have participated in the program. The majority of participants have been volunteers. Volunteers are permitted to have the terms of their driving prohibition reduced by participating in the program but are restricted to driving a vehicle equipped with an ignition interlock device. In certain cases, the driver licensing authority can require offenders to
participate in the interlock program as a condition of licence reinstatement. Overall, only about 10% of all eligible offenders participate in the program.

The interlock service provider operates two dedicated service facilities in the province—one in Calgary and one in Edmonton. Those who wish to participate must attend one of these centres for installation and routine maintenance every 60 days thereafter. Offenders’ use of the interlock is monitored through the internal data recorder, and the duration of participation can be extended for program violations or repeated breath-test failures.

The Alberta interlock program has been used in a series of research studies (eg, Beirness et al, 2003; Marques et al, 1999, 2001), including an evaluation (Voas et al, 1999).

**Quebec**

The Province of Quebec implemented an ignition interlock program in December 1997 as part of a package of legislative reforms that included administrative licence suspension, vehicle impoundment for driving while disqualified, and mandatory assessment for repeat DWI offenders. To date, participation in the program has been voluntary, and more than 20% of eligible offenders have taken advantage of the opportunity to reduce the length of licence suspension by enrolling in the interlock program. Since inception, approximately 24 000 DWI offenders have registered with the interlock program.

Quebec officials attribute the relatively strong participation rate to three factors: (1) there is a network of 22 installation centres across the province; (2) a letter and an information folder are sent to every driver who has been convicted of a drinking-and-driving offence; and (3) coincident with the implementation of the interlock program, vehicle impoundment was introduced for driving while suspended or driving a vehicle without a required interlock device. Despite the apparent success of the recruitment into the interlock program, changes are currently underway to make participation mandatory for virtually all repeat offenders and many first-time offenders by 2005.

The Quebec program has been subject to an ongoing evaluation, and reports have been prepared and presented at previous ICADTS meetings (Dussault and Gendreau, 2000; Vézina, 2002).

**Ontario**

The Ontario government launched an ignition interlock program for all DWI offenders in December 2001. The Ontario program is unique in Canada in that it does not allow offenders to take advantage of the reduction in the period of prohibition allowed by federal law. Rather, first offenders in Ontario must serve the entire 12-month prohibition from driving and thereafter are restricted to driving a vehicle equipped with an approved alcohol ignition interlock device for an equivalent period. For
second offenders, the period of prohibition is 3 years followed by 3 years with an interlock restriction. Multiple offenders only become eligible for the interlock program after serving 10 years of a lifetime suspension. In these latter cases, the interlock restriction remains in force for life. Although the interlock licence restriction is mandatory for all DWI offenders, they do not have to enter the interlock program if they choose not to drive for the duration of the interlock restriction.

Prior to becoming eligible for the interlock program, DWI offenders in Ontario also must complete a mandatory remedial measures program. This program involves an alcohol assessment, attendance at either an education or a rehabilitation program, and a follow-up interview 6 months later.

An expanding network of installation centres is being developed to serve the population in a larger geographic area and as demand for the interlock program grows. The program is relatively new; therefore, sufficient data are not yet available for a formal evaluation.

Other Jurisdictions

Several provinces with smaller populations have also implemented ignition interlock programs—Saskatchewan, Manitoba, Newfoundland, and Labrador—as well as the Yukon Territory. These jurisdictions offer DWI offenders a reduction in the period of hard licence suspension as an incentive to participate in the interlock program. One of the foremost challenges faced by these programs is the ability to provide interlock services to a relatively small number of DWI offenders spread over vast geographic areas. Having to travel long distances for the installation and maintenance of an ignition interlock provide another disincentive to participation. Nevertheless, interlock programs are operational in these jurisdictions and as the demand for interlocks grows, services will likely expand to meet the need. It may also be necessary to develop novel approaches for the delivery of interlock services to clients in low populated areas outside of urban centres.

Summary

In recent years, interlock programs have proliferated across Canada. The development of ignition interlock programs is an element in the federal/provincial Strategy to Reduce Impaired Driving. Combined with the federal legislation allowing for a reduced period of driving prohibition for DWI offenders who participate in interlock programs, it is likely that other provinces and territories will begin to consider seriously the implementation of interlock programs. Meanwhile, in provinces that have interlock programs, there is a growing movement towards making participation a mandatory condition of licence reinstatement.
References


Interlock Service from a Multipurpose Auto Services Company: The View from Québec’s Lebeau Vitres d’Autos

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What is the experience of a company that provides interlock service as one of several other consumer services?

Belron Canada Inc. is a wholly owned subsidiary of Belron s.a., based in London England. Belron Canada has three retail brands—Lebeau Vitres d’Autos, Duro, and Standard Auto Glass—that form a network of retailers servicing the automotive aftermarket. The core products are auto glass and related accessories, including electronic aftermarket products.

For more than 25 years, Lebeau has developed expertise in the installation of automotive electronic aftermarket products such as car radios, remote starters, alarm systems, antitheft devices, and now, interlock systems.

Guardian Interlock Systems (GIS) contracted with Lebeau Vitres d’Autos to provide 22 service centres throughout Québec and the technical staff to install, service, and de-install ignition interlock devices for the Québec interlock program. The staff also trains interlock recipients on how to use the devices.

The combination of Lebeau’s retail presence in the automotive aftermarket and their technical skills in automotive electronics coupled with Guardian’s skills in Ignition Interlock Program administration, management, and technology provided the basis for mastering the challenge that was presented by the Société de l’assurance automobile du Québec (SAAQ) in order to meet the objectives of the Québec interlock program.

The agreement between GIS and Lebeau Vitre d’Autos made it possible to set up interlock service centres rapidly in communities throughout Québec. The 22 Lebeau interlock service centres in Québec may be one of the reasons why Québec has had one of the strongest growth curves for new interlock installations in North America. In just the first 3 years after program initiation, the number of new interlock installations in Québec became the most in Canada at that time.

¹³ Lebeau has 70 centers across the province of Québec.
Challenges

Program philosophy

Because of Lebeau Vitre d’Autos’ knowledge of and expertise with automotive electronic products, installation and removal of the interlock was easily understood by our technicians. But an interlock program goes beyond the technical aspects: like most interlock programs, the Québec program is, in its essence, a complex management structure of controls and supervision, regulated by laws.14

A global understanding of the program philosophy means that Lebeau employees know what they have to do, when they have to do it, and the impact of their actions or lack of action. They know that the Québec Province’s driver licensing authority, SAAQ relies on the integrity and accuracy of their work to make decisions and that the customer’s driver’s licence is affected accordingly. In Québec, service centre representatives are required to collect evidence (customer’s written declaration, invoices, photos, etc.), document the customer’s file, analyse the datalogger, compare the customer’s declaration with the datalogger, report non-compliant events to GIS, and so on. All these administrative requirements are not easy to impress on sales personnel.

Therefore, one of our biggest challenges was to “transform” existing sales personnel into program officers, a task that increased in difficulty with their years of experience in sales. Asking sales persons, who are accustomed to settling “quick deals,” suddenly to become program officers who monitor their customers was not easy to achieve.

Part of the responsibility that comes with acting as a program officer involves considering the customer more like a participant: a participant must comply with obligations and restrictions, whereas a regular customer does not. This means that service has to be provided within program conditions and regulations. For service representatives, this means knowing what they can or cannot do when servicing a customer.

Employee training

Initial training also was an interesting challenge. With centres spread all across the province, training had to be given to all of the centres at once. We organised and coordinated training for approximately 40 service representatives and 20 technicians, during a weekend, through intense and difficult sessions. They had to familiarise themselves with new complex laws and regulations, as well as learn procedures for documenting a file, becoming familiar with analysis and reporting, and using new software and hardware. Even if support staff had been available from the outset, going back alone to their service centre and integrating all this new knowledge into daily operations with a different type of customer was disconcerting for many of them. In short, this was a major shift in the workplace culture.

14 DWI (driving-while-intoxicated) offenses are regulated under the Canadian Criminal Code and the Québec Code de la Sécurité Routière.
Customers

Back in December 1997, Québec was faced with a high demand: 1000 eligible customers were ready to participate in the interlock program. The SAAQ had very effectively promoted the program by advertising its debut in the newspapers and on radio and television. Of course, this important demand was certainly good news, but also it was quite stressful on all interlock program officers and technicians; many new operations had to be handled at a fast pace.

Like in most states or provinces, the Québec population is concentrated in and around major cities (Montréal and Québec). Presently, five centres provide service to 50% of our interlock customers. In each of these centres, at least one dedicated employee works full time strictly on the Alcometre program. In the remaining 17 centres, employees responsible for the interlock program also are involved in all the other Lebeau operations. Factors such as customer volume and being a dedicated versus versatile employee affect learning speed and familiarisation with interlock program tasks and operations.

In addition, rural centres are faced with a different reality than urban centres: in small cities or villages, people know each other. When a regular customer becomes an interlock participant, the salesperson’s point of view may differ from that of the program officer. Employees carrying these two responsibilities may find it difficult to restrict their service to program conditions (e.g., charging a penalty fee) when servicing a good Lebeau customer.

Recommended Solutions or Approaches

All these challenges were mainly encountered in the beginning of the program. Today, after 6 years of experience, we have definitely learned a lot. If we had to start another program, we would strongly recommend a progressive introduction in all areas of the program: employee training, opening of the service centres and servicing of eligible customers. It also is highly recommended to hire people who already have good computer skills.

Training, coaching and follow up: Key elements of the program success

For centres located in remote areas, group training is the fastest and most efficient method to disseminate information. Acquisition of new knowledge and abilities takes time, questions need to be asked, and employees need to be evaluated; group sessions are not suited to that purpose.

Therefore, proper training should include individual coaching to determine if training elements were well assimilated. Another improvement training would include “on site” training (at the service centre location) to see how all the new operations are integrated with the rest of the business. This also allows for a better appreciation of the employee’s working environment and conditions.
Assistance through constant communication combined with regular coaching is essential for proper support. This also is the way to ensure an understanding and an integration of the changes that occur and are first communicated by memo.

Training certainly has an impact on the acquisition of the program philosophy, but of course, experience remains the key element to grasping all the different aspects of an interlock program.

This being said, because experience is gained by practice, the number of customers directly affects the officer’s work. In Québec, the volume of customers varies from nearly 500 in the biggest centres to as few as 30 in the smaller ones.

The main concerns and outstanding issues follow:

- Servicing a customer within the program’s rules of engagement (do’s and don’ts).
- Control basic knowledge to understand and integrate procedures and/or law changes that may occur from time to time.
- Facilitate supervision and follow-up by having an “on-road” trainer who would verify if program conditions and requirements are respected.

In our busiest centres, the coaching and follow-up are more related to mistakes and oversights resulting from a heavy workload as opposed to smaller centres where errors are mostly caused by a lack of routine due to the low volume of clients.

Consequently, we have developed a regularly updated procedures manual over the years (with the help of GIS Québec) that has become a practical reference tool for both the larger and the smaller centres. It also is very useful for centre audits and on-site follow-up. In addition to technical and computer support, employees also require moral support.

In the major centres, it is critical for management to give as much importance to managing the program as to managing the other products and services, which requires a good deal of flexibility. This is because of the difference in the customer service philosophy behind a monitoring/control program and regular retail sales. By being familiar with program operations, the manager easily can support and advise the employee regarding both customer service and administration, while supervising the installation.

Participants in the interlock program are not customers who come to us to looking forward to an exciting experience of buying a car radio or a remote starter. Some of them can be frustrated by program requirements and may become impolite or aggressive; nonetheless, we have to provide them with professional service according to required standards. In this sense, it is important to provide the employees with a safe working environment
that provides some privacy while not cutting them off from other customer service operations.

Naturally, the input of an experienced technician able to detect technical problems, which are most often related to poor vehicle working condition, is definitely a significant advantage when it comes to troubleshooting. Collaboration between the customer service representative and the technician is therefore crucial to successful program management. In less busy centres, interlock service often is provided by managers, who control these aspects of program management and are directly accountable for their service performance and the financial dimension. Indeed, for several centres, the program would not be viable if it were not combined with other operations. Thus, it is important for the manager to understand that the contribution by all of the stores makes the program financially viable for the company. This is one of the positive aspects of the GIS-Lebeau partnership in managing the interlock program.

The expected growth of the program in coming years, however, will improve the financial aspect for the smaller centres, which will certainly enhance the manager’s interest in the program. After all, we also are in business to make money.

**Future Considerations**

**The future is promising and will bring many new challenges.**

The annual growth expected over the next 4 years will force Lebeau Vitres d’Autos to analyse and reinvent its ways of doing things both in service to participants and in physical installation, making it possible to accommodate people in a climate that reinforces the proper management of the program.

Understanding the new realities of the drink-driving laws and adapting our work to them also is an issue. Only communication, follow-up, and regular coaching can ensure the quality of service in a growing program such as we expect this one to be.

More frequent evaluation and follow-up calls to the centres will be a key element for maintaining the quality of our interventions with the participants. Effective telephone support will continue to be the key ingredient of the day-to-day operation.

More focused training of our employees, installers, and managers at the GIS Qc Training Centres will be a key factor in properly understanding the operations and philosophy of the interlock program and of our corresponding obligations.

**Conclusion**

For the past 6 years, the program has been a success. Now, the challenge is to maintain the growth of this success in the context of a significant
increase in volume. Following are some essential ingredients to Québec’s recipe for success:

- Collaboration between partners: good partnership and honest cooperation between the SAAQ, GIS, and Lebeau will ensure that all efforts go in the same direction: improving road safety and program success.

- Direct mailing to each eligible client: in Québec, SAAQ sends a letter, including a program brochure, to each convicted driver.

- Toll-free lines available at SAAQ (for information about eligibility criteria and requirements) and at GIS Québec (for information about service and installation centres).

- Information sessions: SAAQ provides information to explain the program to judges, crown prosecutors, and police officers.

- Quality service through wide network: Lebeau's capacity to provide high-quality service and installation through 21 centres.

- Dedicated staff and resources: each partner must have supporting staff to assure efficient assistance in all areas (technical, administration, procedures, etc).

- Audits and constant communication: these are essential to maintaining the quality of service provided for in the program rules and obligations.

We are privileged in Québec to have good laws, good moral grounds regarding the control of driving under the influence, great partners (ACS and the SAAQ), and qualified employees.

In the long run, Lebeau has a chance to improve its service centres and is bound to evolve and prosper with the growth of the number of participants.

The Quebec program is an example in ignition interlock and has everything needed to remain that way for a long time.
Figure 1. Map of all Lebeau Centre Locations in Quebec
An Integrated Alcohol Interlock Scheme for Western Australia

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Introduction

Western Australia is currently developing a statewide alcohol interlock scheme within a comprehensive drink-driving program to reduce repeat drinking and driving and the associated harm. A 12-month planning stage was undertaken by an expert working group established to review the issue of drinking and driving and propose a model program for Western Australia. The interagency group comprised senior representatives from all the stakeholder agencies including police, traffic safety and licensing, alcohol and drug services, justice, and road safety researchers. The group has proposed a comprehensive drink-driving program based on international best practice and research evidence. Alcohol ignition interlocks were considered within the integrated model.

Alcohol interlock devices have been shown to reduce drink-driving recidivism significantly while installed on the driver’s vehicle. International studies consistently report that participants involved in alcohol interlock programs exhibit a significantly reduced rate of drink-driving recidivism. However, it is clear that alcohol interlocks are not a panacea. Universally, interlock programs report very low participation rates. Further, studies indicate that while interlocks effectively prevent impaired driving while installed on a vehicle, there is very little residual effect once the device is removed (Voas, 1999).

A major problem with interlock programs in all jurisdictions is the fact that only a very small proportion of eligible drink-driving offenders are willing to install them in order to drive legally. Some of reasons for the low participation rates include cost, inconvenience, and social stigma (Beirness, 2001). The fact that driving without a valid licence may be a more attractive option is possibly one of the critical factors related to participation rates in interlock programs.

Another problem relates to the long-term outcomes once interlocks are removed from offenders’ vehicles. Drinking and driving is not an isolated behaviour and tends to occur among a constellation of other social and psychological problems. This is particularly true where recidivistic drinking drivers are concerned. A significant number of repeat drinking drivers qualify for a clinical diagnosis for alcohol dependence in addition to exhibiting a range of other social and psychological problems (Fetherston et al, 2002). Alcohol ignition interlock devices do not change these situations, and if the factors that underlie the drink driving behaviour are not addressed successfully, it is likely that outcomes will be compromised.
Interlocks are not intended to replace existing sanctions but to provide additional options for preventing drinking and driving and as an adjunct to other drink-driving countermeasures. Increasingly, researchers are concluding that improved results will be obtained from interlock programs when they are integrated with legal sanctions and remedial programs (Beirness, 2001).

This paper outlines the issues considered by the Repeat Drink-Driving Working Group in Western Australia and explores some of the complexities associated with designing an integrated drink-driving program to be implemented across government, nongovernment, and private-sector services.

The benefits of working with hindsight

The work undertaken in Western Australia benefited from the extensive experience gained in other jurisdictions. There is a significant amount of international research focused on drink-driving countermeasures including alcohol interlocks. There also is a wealth of information on the practical experience gained by jurisdictions that have established alcohol interlock programs and a willingness to share the lessons learned and the wisdom of experience.

Some broad objectives were developed by the working group to guide its deliberations. These were informed by a review of the literature and considerable consultation with other jurisdictions in Australia and overseas and included that the program be—

- evidenced based and informed by best practice principles;
- able to provide graduated sanctions and remedial options appropriate to individual offenders’ circumstances and needs;
- inclusive and aim to engage all those deemed eligible to participate;
- able to keep offenders operating within the system of formal controls wherever possible and reduce the number who choose to drive without a valid licence;
- non-discriminatory and consider the specific needs of those who are socially or economically disadvantaged;
- structured in such a way that maximises voluntary participation whenever possible;
- accessible in regional and remote areas; and
- subject to ongoing monitor and review.

The working group assessed all the drink-driving countermeasures being considered against each of the above principles to guard against unintended consequences and maintain the integrity of the overall program being proposed. The principles that proved the most challenging were the
ones requiring that the program be inclusive, be non-discriminatory, and limit unlicensed driving. These issues are particularly challenging when related to the target group, which in Western Australia is predominantly young male drink-driving offenders, many of whom are socially and economically disadvantaged and includes a high proportion of Aboriginal people who live in rural and very remote areas.

Problems related to interlock programs

There are a number of difficulties associated with interlock programs outlined in the literature. Some relate to the devices themselves, some concern participant compliance, and some are program and operational issues. However, two important issues are consistently identified as problematic. One relates to participation rates, and the other to maintaining the reduction in drink-driving recidivism once the interlock device is removed from the vehicle.

The problem of participation

The United States and Canada have more alcohol interlock programs than any other jurisdictions. However, studies consistently report very low participation rates in both these countries. In the 43 states in the United States with interlock enabling legislation, the installation rate rarely exceeds 10% of eligible drink-driving offenders, with 2% to 3% being the most common (Marques et al, 2001).

Significant increases in interlock participation rates only appear to eventuate in circumstances where interlocks are offered as an alternative to more severe punishment, such as vehicle impoundment or forfeiture, house arrest, or imprisonment. The jurisdictions that report higher participation rates in interlock usage generally attribute the success to judicial practices that provide alternative and more severe sentencing options programs (Voas et al, 2002; Marques et al, 2001).

Voluntary versus mandatory participation

There is widespread agreement among researchers that participation in interlock schemes should be maximised to reduce drink-driving recidivism. It is tempting to deduce that the best way to achieve this is to make interlocks mandatory for all drink-driving offenders.

Mandated interlock programs generally require a drink-driving offender to drive with an interlock as a condition of re-licence following a period of licence disqualification. Mandated programs assume that drink-driving offenders place a high value on a valid driver’s licence and generally do not respond to the significant issue of unlicensed driving among disqualified drinking drivers. The success of the model relies to a large part on offenders not driving during periods of licence disqualification and then uniformly applying for a new licence.

Evidence suggests that this is often not the case. It would appear that a significant number of disqualified drivers do not hold such values and continue to drive, as well as drink and drive, during periods of licence
disqualification (Williams et al, 1984; Ross and Gonzales, 1988; Smith and Maisey, 1990; Mirrlees-Black, 1993). In addition, many offenders also fail to apply for a new licence at the end of their disqualification periods, preferring instead to continue to drive without a valid licence, presumably because they perceive the chance of detection as low and the alternative as too onerous.

Another issue related to mandated programs is that the prescribed interventions (i.e., rehabilitation and interlocks) generally are provided as conditions for relicensing. In effect, this can mean that effective and proven interventions are not instituted for many months or even years after the drink-driving offence. There could be an argument from a road safety perspective that drink-driving offenders should be involved in interventions with proven efficacy in reducing drink-driving recidivism as soon as possible after their drink-driving offence. The best way to achieve this may be to institute drink-driving countermeasures as sentencing options rather than providing them as conditions before re-licensing.

Many of the voluntary interlock programs go some of the way toward this. Such programs generally offer incentives for the drink-driving offender to participate in interlock programs, usually by offering opportunities for plea-bargaining. An offender may volunteer to install an alcohol interlock device as a means to more rapid licence reinstatement. In this instance, the drink-driving offender chooses to install an interlock in exchange for a shorter suspension period. Commonly, the licence disqualification period is halved in exchange for an agreed-upon period of interlock driving, which usually equates to at least the original disqualification period.

However, the evidence indicates that the majority of mandated and voluntary programs are associated with similarly low participation rates. It would therefore appear that these measures may not be sufficient to motivate participation when weighed up against the inconvenience, cost, and stigma associated with interlock driving (Beirness, 2001). Greater incentives for participation need to be explored, and correspondingly, disincentives to driving without a valid licence need to be boosted.

**The pervasive issue of unlicensed driving**

Unlicensed driving is a serious problem in most jurisdictions. The level of illegal driving by suspended/disqualified/never-licensed drivers in all jurisdictions is relatively high, estimated to be anywhere between 30% and 70% (Williams et al, 1984; Ross and Gonzales, 1988; Watson, 2003). Unlicensed driving represents a problem in several respects. Most importantly, it undermines the effectiveness of licence disqualification and other drink-driving countermeasures by providing a viable alternative. It also is associated with other high-risk driving behaviours, including drinking and driving and speeding (Watson, 2003). Unlicensed drivers in fatal crashes have been shown to be three times more likely than licensed drivers to be alcohol impaired (Road Traffic Authority, 2000). To this end, unlicensed driving clearly needs to be addressed within any drink-driving strategy if the aim is to maintain the integrity and effectiveness of drink-driving programs.
To achieve this, supporting legislation with provision for compulsory carriage of licence needs to be in place, as well as mandatory identification of driving conditions on all drivers’ licences. These initiatives need to be implemented in conjunction with a significant increase in the checking of drivers’ licences through broad-based, random licence checks at random breath testing (RBT) and during other police activities. They also need to be well supported by public education.

**Some possible solutions to these problems**

There is consensus in the literature that alcohol interlock schemes should be developed in such a way that maximizes participation from all eligible offenders. However, it is difficult to determine how best to achieve such an outcome. Participation rates may be increased if a range of flexible options were available to motivate offenders to opt for an alcohol interlock. To maximize outcomes, alcohol interlock schemes also may benefit from being better integrated with other drink-driving measures such as rehabilitation programs. Likewise, the integrity of drink-driving programs also may be better protected if legislation and policies were in place to address and limit unlicensed driving.

Providing offenders with the opportunity to significantly reduce their licence disqualification periods and offset the associated costs by deferring fines may maximize participation in alcohol interlock schemes. Fines should not be waived until successful completion of the program to increase the incentive to comply with interlock program requirements. Where noncompliance is demonstrated, offenders should be returned to court and the full fine and disqualification period reinstated.

There is good evidence that installing an alcohol interlock on a vehicle effectively separates the acts of drinking and driving. There also is evidence that alcohol interlocks are more effective in reducing drink-driving recidivism than licence actions on their own (Beck et al, 1997). This would suggest that licence actions should be integrated with interlocks and that drink-driving offenders should be encouraged to participate in interlock programs as soon as possible following a drink-driving offence.

Unfortunately, there appears to be little research evidence to guide deliberations as to the optimum time required before a drink-driving offender becomes eligible for an interlock licence. However, it could be argued that the wait time should be kept to a minimum and offenders rapidly brought under a system of control where their driving can be well monitored. When considering the optimum time required before an offender becomes eligible for an interlock licence, the value of licence disqualification needs to be balanced against the risk of driving without a valid licence and the benefits of early participation in an interlock scheme.

**The Proposed Model for Western Australia**

It is proposed that an alcohol interlock scheme be established in Western Australia as part of a comprehensive drink-driving program, that the
scheme be supported by clear legislation and well integrated with other drink-driving countermeasures.

The overall aim of the proposed drink-driving program is to reduce repeat drinking and driving and the associated harm caused by drink-driving offenders. A series of coordinated and interrelated interventions is proposed to provide a comprehensive response to all drink-driving offenders. The program will build on existing penalties for drinking and driving and include several new legislative provisions and a range of supporting initiatives.

Overview of the Western Australia interlock scheme

- The alcohol interlock scheme will be a statewide program provided through the private sector with approved businesses providing the service.

- The scheme mainly will target repeat and high BAC (blood alcohol concentration) drink-driving offenders.

- The scheme will be integrated with rehabilitation, and as a condition of receiving an interlock licence, participants will be required to undertake a drink-driver education course or engage in alcohol treatment as identified through assessment.

- The option of an alcohol interlock will provide for a significant reduction in the licence disqualification period.

- The period of interlock driving will be for a minimum of 6 months and will never be less than the original licence disqualification period. The maximum period of interlock condition will be performance based.

- An interlock condition will be marked clearly on the driver’s licence, the driver will be required to carry the licence at all times, and the driver will only be permitted to drive an interlock-equipped vehicle.

- Compliance with the licence conditions will be monitored through interlock data, and participants’ progress will be closely supervised.

- The scheme will operate on a user-pays basis with the option for fines to be deferred to offset the associated costs and waived upon successful completion of the program.

- There will be an additional hardship subsidy for those that demonstrate genuine financial hardship.

Maximizing early and voluntary participation

The program aims to maximize early and voluntary participation wherever possible, and a range of flexible sentencing options will be made available to the courts so magistrates can respond effectively to the particular circumstances of individual offenders. These options will be integrated
with the existing penalties (licence actions and fines) and include the options of—

- assessment for repeat and high BAC drink-driving offenders to identify serious alcohol problems;
- drink-driving education for offenders without serious alcohol problems;
- alcohol treatment for offenders assessed with serious alcohol problems;
- significantly reduced licence disqualification periods where an offender agrees to drive an interlock-equipped only and participate in a rehabilitation program;
- vehicle-based sanctions such as immobilisation, impoundment and forfeiture where high-risk offenders refuse to engage in a rehabilitation program and continue to drive unlawfully;
- an intensive supervision order for high-risk repeat offenders; and
- a custodial sentence when all other interventions have failed to curtail unlawful driving.

**Integrating alcohol interlocks with fines**

It is appropriate that fines be incorporated into the mix of drink-driving penalties at a level that has potential to support the general deterrent value of licence sanctions and to portray to the community that drinking and driving is viewed as a serious offence. However, continuing to raise fines as a means to reducing repeat offending has been shown to have limited effect (Nichols and Ross, 1990).

The revenue from fines, however, does provide the opportunity to offset some of the costs related to specific drink-driving countermeasures. This strategy has the potential to facilitate increased participation in rehabilitation and interlock programs, two interventions with proven efficacy in reducing drink-driving recidivism.

The program in Western Australia will provide magistrates with the option of deferring fines to offset the costs associated with alcohol interlocks, and following successful completion of the program, the fine will be waived. Once engaged in the interlock scheme, offenders will be motivated to complete the program successfully with the knowledge that should they demonstrate major noncompliance, they will be returned to court and the full fine reinstated.

It is likely that some of those who may benefit the most from an interlock may be less able to pay and, in such cases, the program may provide magistrates with the option to defer fines to offset some of the cost associated with interlock driving for offenders who can demonstrate financial hardship. There may be considerable community, as well as
individual, benefits from making interlocks readily available even to those with limited financial means. Under the proposed model, offsetting the cost of interlocks by deferring and waiving fines would be considered more the norm than the exception.

**Integrating interlocks with licence actions**

Under the proposed model, licence actions will be integrated with interlocks, and an interlock licence will be available for eligible drink-driving offenders as soon as possible after a drink-driving conviction.

A large body of research provides evidence that licence actions are a very effective road safety countermeasure. They have been shown to reduce overall alcohol-related offence and crash rates among first and multiple drink-driving offenders (Nichols and Ross 1990; Ross, 1991; McKnight and Voas, 1991). Studies suggest that the effectiveness of licence actions with drink-driving offenders primarily results from their ability to restrict offenders from driving, and to this end, they are viewed as an effective exposure control measure that produces road safety benefits in addition to their impact on drinking and driving (Peck, 1991; Siskind, 1996).

However, licence sanctions do not necessarily ensure total compliance, and as discussed previously, it has been well established that a sizeable proportion of disqualified drivers continue to drive, and drink and drive, during their disqualification period.

The effectiveness of licence sanctions with drink-driving offenders could be enhanced significantly through their integration with other measures such as interlocks, rehabilitation, and improvements in the detection and better management of unlicensed drivers.

**Assessment to identify offenders with alcohol problems**

Research evidence suggests that a high proportion of drink-driving offenders exhibit serious alcohol problems as well as other psychological and social problems. The early identification of offenders with alcohol problems provides the opportunity for a proactive intervention to occur.

All repeat and high BAC drink-driving offenders will be considered for assessment to identify underlying alcohol problems. Assessment will aim to identify offenders with alcohol and other problems and facilitate a successful referral to an appropriate rehabilitation program. The program will provide opportunities for all drink-driving offenders to participate in rehabilitation programs according to identified need and individual circumstances. At a minimum, the available rehabilitation programs will include drink-driving education and alcohol treatment.

**Integrating interlocks with rehabilitation programs**

There is a body of evidence confirming the effectiveness of drink-driving rehabilitation programs with offenders, particularly when combined with licence actions (eg, McKnight and Voas, 1991; Peck, 1991; Wells-Parker et al, 1995; DeYoung, 1997). The evidence suggests that these programs can
be more effective in reducing alcohol-specific offences, and possibly alcohol-related crashes, than licence actions on their own (Wells-Parker et al, 1995). This success presumably reflects their capacity to address more effectively the factors contributing to drink-driving behaviour.

Integrating interlocks with licence action and rehabilitation should provide better outcomes, both in the short and long term, than any of these measures alone. The interlock scheme in Western Australia will be integrated with rehabilitation programs, and all drink-driving offenders participating in the interlock scheme will be required, as a condition of their interlock licence, to participate in a rehabilitation program. The appropriate rehabilitation scheme will be identified through assessment and include education or treatment for those assessed with serious alcohol problems.

**Vehicle-based sanctions to provide an alternative penalty**

Cancelling or suspending a driver’s licence is a common penalty for many traffic infractions, especially those related to drinking and driving. Despite this, many offenders continue to drive and receive additional traffic violations or are involved in crashes during periods of licence disqualification. To counter this problem, many jurisdictions have enacted legislation that directly affects the offender’s vehicle, such as vehicle immobilisation, impoundment, and forfeiture.

Studies have shown that vehicle sanctions such as these can reduce recidivism rates, and there is some evidence that vehicle immobilisation can reduce alcohol-related crashes (Voas et al, 1996). Vehicle sanction legislation has the potential to act as a general deterrent against unlicensed and repeat drinking and driving and also could provide magistrates with some leverage to engage offenders in prescribed drink-driving programs.

Legislative provisions for vehicle-based sanctions will be included as part of the comprehensive drink-driving program. No matter how successful the program, there will be some offenders whose drink-driving behaviour remains difficult to manage and their corresponding road safety risk will remain unacceptably high. Vehicle sanctions are extreme measures that have the potential to discriminate adversely against innocent people including the families of offenders. However, such sanctions may provide an option for habitual and high-risk drink-driving offenders and could be viewed as less punitive, and possibly more effective, than a custodial sentence in these circumstances.

Imprisonment is the most restrictive penalty available and should be reserved for the most serious offences. Evaluations on the impact of imprisonment for drink-driving offences provide little evidence that this penalty is effective in preventing future offending. It may act, however, as a deterrent for some offenders, and there will be cases where very strict measures are necessary to ensure that the community is protected. For these reasons, the working group has recommended that a custodial sentence remain an option for the courts.
Dealing with the issue of unlicensed driving

As part of the development of the drink-driving program in Western Australia, measures to reduce the incidence of unlicensed driving will be introduced and include innovations that go beyond simply increasing penalties. Of utmost importance is the need to increase the real and perceived risk of detection in the community. Measures to address unlicensed driving will include—

- the integration of restricted licences with alcohol interlocks and rehabilitation to respond to the issue of unlicensed driving for work-related reasons and to increase opportunities for drink-driving offenders to operate within the law;
- developing other strategies to reduce unlicensed driving for work-related reasons, such as encouraging employers to check the licence status of their employees regularly;
- additional penalties for persistent re-offending such as vehicle-based sanctions;
- significant improvements in the detection of unlicensed drivers through the adoption of—
  - compulsory carriage of licence;
  - endorsement of driving condition of driver’s licences; and
  - the widespread, random checking of licences at RBT and other police activities.

Conclusion

Alcohol ignition interlocks hold much promise as a strategy to reduce drink-driving recidivism. However, there are a number of issues that need to be considered if their effectiveness is to be maximized. To increase participation and optimize long-term outcomes, interlock programs need to be well integrated and coordinated with other drink-driving countermeasures. The collective measures need to provide significant incentives for eligible offenders to participate in interlock programs. Such incentives could include a substantial reduction in the period of licence disqualification and providing the opportunity to offset the associated costs by deferring and waiving fines. Countermeasures also need to provide powerful disincentives to unlicensed driving, as well as sentencing options to motivate drink-driving offenders to participate in interlock schemes and comply with program requirements. These measures should include a multimodel strategy to reduce driving without a valid licence (including compulsory carriage of licence, mandatory identification of driving condition on drivers’ licences, and widespread random licence checks), in addition to legislating for vehicle-based sanctions that provide for vehicle immobilisation and forfeiture.

Importantly, if interlock programs are to be successful, they need to effectively engage and retain hard-to-reach offenders including multiple
recidivist drinking drivers. In doing so, they need to take into account the specific circumstances pertinent to many of these high-risk offenders including social, demographic, and economic factors. This group of offenders has presented a particular challenge to authorities in most jurisdictions. In response, new and pragmatic approaches are required that should be guided by principles that aim wherever possible to keep drivers operating within a system of legal control and guard against pushing offenders further out where their driving behaviour remains totally unmonitored until it results in a serious or fatal outcome.
References


The Use of Alcohol Ignition Interlocks in Australia

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Background
At the 2004 ICADTS conference in Glasgow, the first two named authors presented a paper that outlined some of the history of interlock usage in Australia and gave a brief overview of the various programs currently available in that country. This paper builds on that data, particularly regarding the success or otherwise of implementing programs in the various states. Some information also is presented about the use of interlocks in other arenas such as the mining industry.

Progress in Australian states
South Australia was the first state to pass legislation introducing interlocks as a sentencing option. This occurred in July 2001 with the first participants eligible to drive with interlocks in October 2001. Legislation was subsequently passed in Victoria in early 2002, with the program being implemented as of May 2003. Legislation was introduced in New South Wales in September 2002, and its program commenced as a sentencing option in September 2003. In 2001–2003, Queensland conducted a trial of interlocks with offenders allocated to the program through randomly selected trial or intervention courts, and interlock users were compared with offenders in selected control courts. This trial was restricted to the South East corner of the state for logistical reasons and was conducted by an intersectoral research committee led by our university research team and included representatives from the relevant state government departments. The Queensland government is now reviewing drink-driving legislation including the possible introduction of interlock-specific legislation. In 2003, Western Australian commissioned a report to the government on legislation directed towards developing the most effective use of interlock devices. The model they originally proposed was the most radical, in that an interlock licence would be available only 1 month after the drink-driving conviction, and the full disqualification period would not be lengthened unless there was evidence of non-compliance while driving with the interlock. They have recently proposed a revised strategy to counter repeat drink-driving, which includes an alcohol ignition interlock scheme supported by alcohol treatment programs, additional vehicle sanctions such as vehicle impoundment or confiscation, and initiatives to limit driving without a valid licence such as compulsory carriage of licence for all drivers and riders. Legislation is still to be drafted.

From a national perspective, all Australian states endorsed the introduction of interlock programs in the National Road Safety Action Plan 2001–2002. A workshop on interlocks, run in association with the Road
Safety Research Policing and Education Conference for each of the 3 years from 2001 to 2003, has given an opportunity for stakeholders from all states to exchange information and progress about the introduction of the devices into Australia. In October 2004, a small workshop was held in Sydney that provided an opportunity for representatives of the four states with interlock programs to share a wealth of information about the success or otherwise of the various programs.

Models of Implementation

The models considered or introduced in the various states have a range of options. The major variations between the models are related to whether participation is voluntary or mandatory, whether the implementation is based on a judicial model or administrative model, whether use of an interlock is linked to licence disqualification or licence renewal, what modifications to the period of licence disqualification are incorporated, and the costs and how they have been accommodated. Table 1 provides a summary of the state programs to date.

Recruitment

The number of offenders participating in interlock programs was one of the main topics for discussion at the October 2004 meeting in Sydney. Victoria has the only program where the interlock is mandatory for the majority of offenders. The program commenced in May 2002, and there are already more than 1000 offenders on the interlock program, with more than 100 having completed their interlock period. Almost a third of all participants are “discretionary referrals” to the program (the magistrate has the discretion to order an offender onto the program if they are a first offender with a high BAC [blood alcohol concentration]).

The New South Wales program is voluntary and to date has a high take-up rate among those who are eligible. The South Australia program has been operating for more than 2 years and has more than 100 voluntary participants on interlocks as of October 2004. Of those eligible to install interlocks, less than 1% volunteer, an unsatisfactory road safety initiative.

The Queensland trial where interlocks were available in only six magistrate’s courts in the South East corner of the state has had a similarly unsuccessful accrual rate. Only 46 offenders have been placed on the program, and of these, only 28 have had an interlock installed. (The remainder either had a change of circumstances and was allowed to return to court and have their order revoked or breached some condition of the order while attempting to complete the drink-driving rehabilitation program prior to having an interlock installed.) Because offenders were referred to the program at the magistrate’s discretion, there are no precise figures available on the number of eligible drivers. However, during the first year of the trial, of the 137 offenders who were referred for assessment, only 34 (approximately 25%) were placed on an “interlock” order.
Table 1. Summary of State Interlock Programs in Australia

<table>
<thead>
<tr>
<th>STATE</th>
<th>PROCESS</th>
<th>TARGET GROUPS</th>
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</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>• Court order</td>
<td>All vehicle types, including cars, trucks, motorcycles, and professional drivers.(^a)</td>
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<td></td>
<td>• Mandatory for repeat offenders</td>
<td>All repeat offenders mandatory; first offenders with high BAC may be put on the interlock program.(^b)</td>
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<td></td>
<td>• Can appeal against duration if interlock longer than set minimums, or against discretionary – not mandatory – applications.</td>
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<td></td>
<td>• Additional to all current requirements</td>
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<td></td>
<td>• Clinical assessment for alcohol program</td>
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<td></td>
<td>• Drink-driving education program while interlock installed</td>
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<td></td>
<td>• Interlock requirement is a condition on any licence issued post-cancellation</td>
<td></td>
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<td></td>
<td>• Subsidy available for low-income earners</td>
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<td></td>
<td>All repeat offenders must provide proof of fitness for operation.</td>
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<td></td>
<td>First offenders are given the opportunity to participate if they can prove they are fit to operate.</td>
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<tr>
<td></td>
<td>No heavy vehicles, no motor cycles, no public passenger vehicles, no hazardous goods.(^a)</td>
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<tr>
<td></td>
<td>Repeat offenders any BAC; first offenders with high- or middle-range BAC.(^b)</td>
<td></td>
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<tr>
<td>New South Wales</td>
<td>• Court order</td>
<td>Motor vehicle, trucks, not public transport drivers, not motorcycles.(^a)</td>
</tr>
<tr>
<td></td>
<td>• Magistrate’s discretion</td>
<td>All drink driving offences where the disqualification period is normally at least 6 months.(^b)</td>
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<td></td>
<td>• Available for low (below .15) and special (eg, professional drivers) if they are repeat offenders</td>
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<tr>
<td></td>
<td>• Available for all other offenders, regardless of whether first or repeat offence</td>
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</tr>
<tr>
<td></td>
<td>• Additional to all current requirements</td>
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<tr>
<td></td>
<td>• Brief medical intervention including AUDIT</td>
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<td></td>
<td>• Drink driving education/rehabilitation program before interlock</td>
<td></td>
</tr>
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<td></td>
<td>• Interlock requirement is part of sentence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Subsidy available for low-income earners</td>
<td></td>
</tr>
<tr>
<td>South Australia</td>
<td>• Court makes interlock option known</td>
<td>Motor vehicle, trucks, not public transport drivers, not motorcycles.(^a)</td>
</tr>
<tr>
<td></td>
<td>• Voluntary—offered to all offenders BAC &gt;.08</td>
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<tr>
<td></td>
<td>• Disqualification halved + Interlock on for twice the remaining period</td>
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<td></td>
<td>• Mandatory counselling Drug &amp; Alcohol Council</td>
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<td></td>
<td>• Interlock condition is part of sentence</td>
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<td></td>
<td>• Subsidy available for low-income earners</td>
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<tr>
<td>Queensland</td>
<td>• Court order</td>
<td>Motor vehicles only—no motorcyles, no professional drivers.(^a)</td>
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<td></td>
<td>• Probation</td>
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<tr>
<td></td>
<td>• Trial courts only</td>
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<td></td>
<td>• Voluntary</td>
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<tr>
<td></td>
<td>• “Gatekeeper” questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Some discretionary reduction in disqualification period</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Drink-driving rehabilitation program before having interlock installed</td>
<td></td>
</tr>
<tr>
<td>Western Australia</td>
<td>• Court order</td>
<td>Not yet decided.(^a)</td>
</tr>
<tr>
<td>(General principles from strategy and not yet legislated.)</td>
<td>• Mandatory, but with some discretion by magistrates if some alternative program seen as more appropriate</td>
<td>All repeat drink driving offenders, plus first-time offenders with a conviction for DUI.(^b)</td>
</tr>
<tr>
<td></td>
<td>• Disqualification period remains unchanged</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Interlock periods would be minimum 6 months, and graduated according to severity of offence</td>
<td></td>
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<tr>
<td></td>
<td>• Rehabilitation program for offenders with serious alcohol problems</td>
<td></td>
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<td></td>
<td>• Interlock requirement is a condition for reinstatement of licence</td>
<td></td>
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<tr>
<td></td>
<td>• Interlock participation mandatory for offenders seeking an Extraordinary Driver’s Licence (work licence)</td>
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</tr>
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<td></td>
<td>• Subsidy available for low-income earners</td>
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</table>

\(^a\)Vehicle/driver types
\(^b\)Seriousness of offence
Offenders were assessed by the Community Corrections Officer for their suitability to participate based on four “gatekeeper” criteria: having use of a vehicle, being able to pay the fees, being able to provide a breath sample, and being able to access the service provider. In that first year, 70% “failed” to meet the cost, 18% did not have a vehicle on which to install an interlock, and 8% lived too far from the service provider. The remaining 4% suffered a lung disorder that prevented them from easily providing a breath sample or gave some other reason for not being able to participate. Although these figures do not provide any indication of the overall take-up rate relative to the number of offenders who could have been directed to the program, they do give a good indication that cost is a primary factor in any decision by offenders to participate.

The very low accrual rates in all states but Victoria are clear evidence that interlocks currently only reach a very small minority of those who could and should use them. The unavoidable conclusion is that making interlocks mandatory is the only realistic way to ensure that offenders are referred to an interlock program.

**Outcomes and Evaluation**

There are no long-term data on a large group of Australian offenders; however, there now is acceptance among the road safety professionals that the interlock device effectively prevents drinking while driving in an interlock-equipped vehicle. The Victorian program shows great promise for establishing a very useful dataset in the next couple of years. This will afford the opportunity to interrogate the data to examine very specific patterns of behaviour of offenders as they progress through the interlock period, giving a much better understanding for practitioners of how to maximise the impact of interlocks on driver behaviour.

The Queensland trial aimed to test whether the effectiveness of having an interlock installed was enhanced and extended beyond the installation period when it was strongly linked to a substantial drink-driving rehabilitation/education program. Because of the small number of offenders recruited for the trial (n=46), the current follow-up data on re-offence rates will have limited generalisability. However, the doctoral study that was completed as part of the trial provided good qualitative data on the experiences of offenders and gives insights into the processes required to achieve meaningful behaviour change, especially with regard to management of offenders’ alcohol problems and readiness to change (Freeman, 2004).

In terms of process evaluation, the Victorian program is scheduled for review in May 2005. This will provide an opportunity to further refine the administrative processes of that program and to inform other states on process issues.

With the exception of the Queensland trial, where there were six courts designated as intervention courts and another six courts designated as control courts, there is no opportunity for an outcome evaluation where a control group can be compared with the interlock group. Although the
design in Queensland was appropriate for this type of evaluation, the very small sample size has precluded any such analysis.

**Implementation Issues**

Several implementation issues are common to most states. The problem of large distances is common to all the states that have run programs. Solutions or adaptations that have been incorporated to address this problem have mostly comprised limiting the distance that offenders can live from the nearest service provider. It is considered unreasonable to expect an offender to travel too far to have the device installed and serviced.

Service providers have to contend with the economic implications of providing service in outlying areas, and it has been suggested that having fewer than 10 offenders in any one area is not economically viable. However, other more innovative ways to manage interlocks in these areas have been operating in South Australia. These include postal distribution of a replacement interlock device accompanied by a simple remove and replace operation. This requires low skill, and the repackaging and return of the removed interlock by post to the metropolitan service provider for calibration and download of data.

There is a need to address cultural and ethnic issues that impact on the implementation of drink-driving and interlock programs. The indigenous people of Australia, for example, have a different way of conceptualising the problems of and solutions for drinking and driving; therefore, programs need to be modified to suit their understanding of the problem and learning style. There is a whole range of community consultation issues that need to be addressed before any intervention can be implemented, and it is essential to involve key bodies such as Community Councils and Community Justice Groups. The only trial to date of interlocks with indigenous communities occurred in Western Australia and recently was evaluated by Cercarelli and Gavan (2003). The evaluation cited several problems that clearly demonstrated the importance of carrying out a full community consultation process before implementation, targeting the groups most at risk, and incorporating a strong educational component in the program.

There is general agreement that unlicensed driving could be increased where offenders have to complete an interlock program as a prerequisite to having their drivers' licences reinstated. However, the very low accrual rates in most states is considered to be a far greater problem, and it is likely that all states will have to consider mandatory participation in interlock programs as the only solution.

All programs so far operate on the basis of user-pays, and cost is always an issue. However, all states have offered financial assistance to low-income offenders (eg, people on a health card). There needs to be more research and analysis of the costs to the community (health, social, and personal costs), and this might result in the authorities recognizing that “investing” in the cost of providing interlocks to all those who should be
driving with one installed may be a better option in terms of state expenditure.

Safety issues for interlock drivers include provision of safe stopping areas to enable rolling re-tests. In South Australia, the legislation was changed to allow interlock drivers to pull over in clearways and loading zones when required to give a breath sample.

The problem of how to deal with offenders who have clearly not improved their driving behaviour to a satisfactory level while using an interlock can be better addressed when data become available to examine patterns of behaviour. The current situation is that in some states, the period of driving with an interlock is fixed at the time of sentencing, but in Victoria, the magistrate can order an extension of the time when the offender returns to court to apply for licence reinstatement.

There are many other issues including the possible use of interlocks in association with restricted (work) licences that need to be considered before we find the answer to the optimal use of interlocks. Western Australia is proposing that any offender seeking an Extraordinary Driver’s Licence (work licence) will be required to participate in the interlock scheme.

Other Domains for Possible Interlock Usage

The mining industry

The screening of employees in the mining environment is a feature beginning to take hold as a measure to counter alcohol use. In the United States, drug-testing policies are implemented in 46% of companies (Blum, 1989), with figures as high as 27% in safety sensitive workplaces (heavy industry, chemical manufacturing) in the United Kingdom (Silcox, 1992), and 15% in Canadian transport industries (Macdonald and Dooley, 1991).

Although the level of testing in Australia has been considerably lower (1.5% by one 1992 estimate), it does exist (Webb and Fresta, 1994). Companies such as Grimwood Davies drilling have set in place systems whereby employees can be screened at any time for alcohol, with serious disciplinary measures such as dismissal enacted for those returning positive results (Grimwood Davies, 2004). Mt Isa Mines introduced a “safe for work” policy in 2002, which includes pre-employment testing and random urine testing for drugs and alcohol (Mt Isa Mines, 2002). Recent enquiries by the authors\(^\text{15}\) indicate that the use of alcohol ignition interlocks has not been adopted in the mining industry as a countermeasure to drinking and driving in that environment. However, reviews of the drinking practices of mining industry workers in Western Australia (Midford et al, 1997) and Central Queensland (Lennings et al, 1997) have indicated that binge drinking and sustained high levels of alcohol use are relatively common in this specific workforce population. Any response to the drink-driving problem of workers on the mining sites has been in terms of testing for all employees and visitors on entry to the sites and/or random

\(^{15}\) J. Hewitt, personal communication, 5 November 2004; J. Fraser, personal communication, 22 November 2004.
testing of all workers when they are carrying out their duties. The following summary gives some detail on the issues involved in testing for alcohol and/or other drugs in the mining environment.

In a survey of substance use and workplace injuries, McDonald (1995) found that while illicit drugs do not have a probable causal relationship to injury, the relationship holds for alcohol problems and the use of other licit drugs. This lends support to industry-based testing for alcohol but not for illicit drugs (e.g., methamphetamine, cannabis). A number of limitations are present in the existing research on the effectiveness of such countermeasures. The relationship between alcohol use and injuries may be significant only for certain high-risk groups like young males (McDonald, 1995), or research may be anecdotal and inferential in nature. There is no widely available evidence to suggest that workplace testing for alcohol and drugs increases safety and productivity (International Labour Office, 1996).

An examination of the prevalence and trends of workplace alcohol testing conducted in 1995 found that levels of testing in the United States are on the rise, with an increase in a number of industries including a statistically significant rise in testing within mining businesses (Hartwell et al, 1998). Although the majority of industries were found to use random testing as an unconditional alcohol measure, the levels of regular testing were highest in the mining and construction industries. This may recognise the importance of continued testing within such safety sensitive environments, or indeed recognition of the high-risk for alcohol abuse within these employment populations.

Breath testing is supported as a well-developed, tested, and non-invasive manner of screening workers for alcohol (International Labour Office, 1996). Statistics indicate it is yet to gain acceptance as the primary testing measure in the mining industry in comparison to urine analysis, which is still used more extensively (Hartwell et al, 1998). However, a final verdict on drug or alcohol use should not be inferred from an initial test. Best practice dictates that positive results should be verified through further testing to eliminate alternative explanations for the result (International Labour Office, 1996). The US Federal Highway Administration puts in place similar alcohol testing processes for drivers involved in handling of safety sensitive materials, with their random workplace testing involving a dual-breath test policy to confirm initial positive results (US Department of Transportation, 1994).

A number of privacy concerns also must be taken into account in testing for alcohol in the workplace. A report of the Privacy Committee of New South Wales (1992) presents a number of principles to guide best practice in relation to testing. These are ensuring collection of information is lawful and fair, seeking informed consent and making clear aspects of mandatory and voluntary participation, ensuring accuracy of data collected and conclusions drawn, protecting the privacy and security of data, and only using or disclosing personal information in an appropriate manner.
The level of alcohol detection versus the actual impairment level resulting from the substance also is an aspect for concern. This is a distinction picked up by suggestions for the use of fitness-for-duty testing in safety sensitive roles (Burns and Hiller-Stumphofel, 1995). These tests involve designing a performance-based measure that is sensitive to cognitive and physiological impairments. Such tests can involve visual feedback-based coordination tasks such as maintaining the position of an image within two lines. These tests are a potential alternative to the use of standard intrusive or personally confronting methods. They also have the added benefit of being able to detect impairment due individually or interactively with alcohol from other factors such as fatigue.

The transport industry

The transport industry in Australia has made very little use of interlocks. A representative from Drager Australia was aware of only one transport company, in South Australia, that has interlocks installed on five trucks. Reasons suggested by Drager for lack of enthusiasm in the transport industry include cost, the perception that there “isn’t a problem,” and drug and alcohol policies that utilise random screening and other screening techniques among employees. In addition, companies approached about using interlocks request documentation and facts to demonstrate the benefits to their bottom line, and these figures currently are not available as there are not enough voluntary applications installed to produce these data. It was felt that there was need for an incentive in terms of insurance or work cover for companies to see value and see a demonstrable result to their bottom line. A point of view expressed by Jeremy Davey, who has been conducting research into drug use in the trucking industry over the past 5 years, is that compared to stimulants (legal and illegal) alcohol is not a drug of concern for trucking operators and policing authorities. In interviews with truck drivers (Richards, 2004), alcohol use was seen as problematic for drivers as police could easily test for BAC and loss of licence would mean loss of income. Furthermore, heavy vehicle drivers are on a .00% limit (zero tolerance) so there is no room to move as compared to the more typical limit of .05%. In addition, alcohol is a depressant and thus slows the body down and makes the driver drowsy. This condition is opposite to the desired state for many truck drivers who want to stay awake for long periods (hence stimulants are their desired drug of choice). Some individual companies (perhaps petroleum companies) may have interlocks, but it would be only a minor segment of the market.

One interesting innovation was the introduction of a breath-testing device in some buses in North Queensland in 2001. Four new buses being built for Sunbus in Townsville, had an alcohol breath-testing device fitted to the ticketing machine that the drivers had to use while in charge of the bus. Although failure of the breath test would not actually prevent the driver from starting the bus, it did effectively prevent the driver from taking the bus out of the depot because it could not function as a

16 J. Fraser, personal communication, 22 November 2004.
18 J. Davey, personal communication, 6 December 2004.
passenger vehicle if the ticketing machine was not accessible. The authors took the opportunity to survey the drivers from the Townsville depot to ask about their expectations and concerns (if any) about the introduction of the alcohol-testing device. Of the 28 drivers who responded to the survey, more than 95% were confident that they could operate the device, 85% thought the device would ensure drivers would not drink before driving the bus, and 87% thought that the device would not affect the way they drove. They also were not concerned about the nuisance of having the device fitted in the bus, with approximately 68% indicating that it would “not become a hassle” for them, and more than 90% said they thought that the community would benefit from having buses fitted with interlocks.  

It was interesting that the concerns of the management of the depot about the reliability of the device and the possibility that it could interfere with the functioning of the bus in some way proved to be completely unfounded. When interviewed some weeks after the new buses started operating, the managers indicated that they had experienced no problems with the devices. An interesting outcome of the introduction of the device was the immediate resignation of one driver who had been suspected of having an alcohol problem. One can assume that he decided it was better to resign and not expose himself to the risk of failing a breath test.

The insurance industry

There seems to be little or no action in the insurance industry in terms of accepting the use of an interlock as a condition for offering insurance coverage to drivers with a drink-driving history who would normally not be able to have such insurance.

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19 Schonfeld, 2001, unpublished data.
References


Cercarelli, L. R., and Gavin, A., 2003. A review of the use of alcohol ignition interlocks in aboriginal organisations in Western Australia. Crawley, Western Australia: University of Western Australia, Serial No. RR126.


2005 Update Notes in Australia: Vendor View

Les Libbesson
Guardian Interlock Systems, Sydney, Australia

Contrary to newly optimistic views of interlock program activity in Australia, interlock companies trying to do business there for the past 10 to 15 years have been held back by constant delays. Australia was among the earliest nations showing an interest in interlocks and, in the early 1990s, published the first national standards document for interlocks. However, legislative inaction combined with an excessively restrictive standard made it difficult for interlock programs to get started in Australia. Currently, there are two suppliers in Australia: Draeger and Guardian. Both operate in South Australia, Victoria, and New South Wales.

South Australia

The South Australia program is 3.5 years old and has leveled out at about 125 interlock program participants. It currently is showing little evidence of growth. However, an ongoing review of program features may improve the situation.

Although the politicians are asking the right questions about the poor take-up rate, there appears to be little real motivation to adjust policies in order to create incentives. A major reason for the poor take-up appears to be because drink-drive offenders do not believe the benefits of the interlock program are sufficient to outweigh the cost involved because they always have the easy option of occasionally driving while their driving license is suspended. The risk of detection seems to be acceptably low, making driving while suspended a relatively more attractive option.

Victoria

Although one of the smaller states geographically, it has the second highest population. On 13 May 2003, Victoria commenced a mandatory interlock program that started well. In the vicinity of 20 000 drivers lose their licences annually because of DUI offences, and the mandatory interlock program means that Victoria has the potential to be a very high utilizer of interlocks.

By 2005, the Victorian courts had ordered approximately 2000 individuals to participate in interlock programs. However, as with other jurisdictions, there is a problem of compliance. More than 300 offenders have not bothered to get a license, whereas another 300 have received licenses but have not installed an interlock. More than 500 have completed their programs. VicRoads, the state licensing authority, is currently conducting a review in order to finalise the features of its program. Clearly these developments represent positive change.
New South Wales

New South Wales, the most populous state, began its interlock program 6 months after Victoria. New South Wales has the highest number of DUI convictions, exceeding 26,000 per year. The most exciting aspect of the New South Wales program was that it had proposed very attractive incentives for offenders to participate and appeared likely to have an extremely high take-up rate. Legislation did not fulfil the early promise.

Sadly, this has resulted in a self-defeating program. Financial incentives appear to have been abandoned because of bureaucratic difficulties, and the attractive interlock suspension and participation periods have been implemented in such a way as to virtually deter participation, especially among the less serious offenders. An example is that a 12-month suspension can be replaced by a 6-month suspension, followed by 2 years on the interlock.

The prognosis appeared excellent; however, the reality is an extremely slow medium-term growth. There are currently 240 participants in the NSW program, with a monthly growth of about 20.

Western Australia

Western Australia’s program was funded with reasonable resources after Cabinet approval, but it is only now into the planning stage. Consequently, it will be at least 12 to 18 months before anything happens. Melanie Hands, the author of the comprehensive description of the Western Australia program in this volume, is still involved along with other developers, and after it starts, the future for the program is promising. It will truly address the provision of interlock services in remote areas.

Queensland

Queensland has been showing signs of increasing interlock activity, and its interlock program representatives will make a 2006 report to parliament on their progress. A road safety conference to be held at QUT (Queensland University of Technology) in mid-August will assist in developing plans for the future.

Tasmania

Tasmania came to the recent national meeting but for fact finding only. There appears to be no active interlock program planning there.

Summary

Interlock acceptance in the more densely populated parts of Australia faces issues similar to those seen in other nations. Like the USA and Canada, each state and territory has its own legislation on licensing and safety, rendering any national program unlikely in the short term. Furthermore, it is still not clear if there is a good model anywhere in the world for
interlock service in thinly populated areas; however, if any world region can help answer that question, it is likely to be Australia.

The Way Ahead

On a positive note, however, some of the difficulties have begun to be discussed and perhaps resolved. A meeting of all professional stakeholder groups in Australia convened in early 2005 to discuss interlock implementation barriers. Researchers, suppliers, and government officials judged the meeting worthwhile, and the groups plan to meet every 6 months, with the next occasion immediately after the 2005 Ignition Interlock Symposium in Annecy, France. Informal discussion among a wider audience indicates an improved attendance at the next meeting.

ICADTS Assistance

The prestige of ICADTS could be used to sponsor a framework approach so that authorities (and even researchers new to the subject) can become aware of the ease with which the best intentions can be frustrated by individual stakeholders insisting upon particular positions. Currently, there is no central place where this type of knowledge is collected.

It is hoped that ICADTS will continue to identify the barriers to successful interlock programs.
# Abbreviations Used in This Document

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<td>driving while intoxicated</td>
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<td>Tenth International Classification of Diseases</td>
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<td>mean corpuscular volume (of red blood cells)</td>
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<td>TEA-21</td>
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<td>Vägverket</td>
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<td>WBAA</td>
<td>whole blood acetaldehyde</td>
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<td>Ignition Interlock Licensing Act (of New Mexico)</td>
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