IDENTIFYING ONE TIME VERSUS CHRONIC ALCOHOL ABUSERS: A FEASIBILITY STUDY OF A COMPUTER-ASSISTED ALCOHOL SCREENING PROGRAM FOR DWI OFFENDERS IN DRUG COURT.

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Abstract

Alcohol use patterns that are harmful to an individual's health are prevalent among DWI (driving while intoxicated) offenders and are a key predictor of recidivism. The aim of this proposed program evaluation was to determine the feasibility and usability of a computer-assisted Screening, Brief Intervention and Referral to Treatment (SBIRT) program for DWI offenders. The current treatment program consists of a computer based, self-guided screening tool for gauging alcohol use patterns and generating a personalized feedback report designed to supply a brief motivational intervention and, if needed, a referral to treatment. Multiple studies suggest that computer-assisted SBIRT may be successfully implemented within the criminal justice system to DWI offenders soon after the offense, and this review of recidivism rates and technologies in Minnesota's Sixth District DWI Court's pilot SBIRT program provides both a framework for a feasibility study, as well as further research in its possible effects on treatment utilization and recidivism.

A Review of Recidivism Rates and Technologies in
Minnesota's Sixth District DWI Court's Pilot SBIRT Program

Purpose

The purpose of this paper is twofold. First, it is to provide an evidence-based foundation for a descriptive, quantitative, quasi-experimental study of high/low recidivism rates between Screening, Brief Intervention, and Referral to Treatment (SBIRT) driving while intoxicated (DWI) clients (experimental group) and non-SBIRT DWI clients (control group) in Minnesota's Sixth District DWI Court's pilot SBIRT program.

The second purpose is to outline the necessary components and steps for a review of the reliability, usability, and security of the implemented onsite Sixth District ad hoc SBIRT DWI client database, and to define a set of key factors related to service needs to be used in optimizing compatibility with the established local, state and/or federal electronic judicial records systems, and provide a foundation for standardized technology effectiveness evaluation procedures.

Need for Study

Although crime and justice researchers have made tremendous advances in the ability to classify DWI clients per general recidivism, alcohol consumption patterns tend to differ according to age, gender, and work status, and there has yet to emerge a definitive and tested instrument that can be used in executive decision making for identifying one-time versus chronic alcohol abusers in a DWI Court. In an effort to offer a more direct and balanced approach that identifies and caters to the specific needs of first time and multiple time DWI clients, Minnesota's Sixth District Court has adopted an early-intervention SBIRT pilot program. According to a recent report, the Sixth District DWI Court maintains an 81 percent success rate in

reducing recidivism, which suggest that the applied computer-based SBIRT model may have a significant influence on the results (Olson, 2015). In addition, three separate pilot DWI Court SBIRT program studies suggest that after similar early interventions, DWI Court clients are up to nineteen times less likely to get a new DWI offense than those clients sentenced by a traditional court (Hiller, Saum & Taylor, 2009; MSCA, 2008; NHTSA, 2011;). It should be noted, one area of concern is that in two of these three studies a relatively short follow-up window was used, ranging from three to twenty-four weeks after beginning the program, not allowing the one to two years that is generally accepted as an adequate period for recidivism to occur or be detected (NHTSA, 2011; Vlavianos, Floerke & Carey, 2014;). In addition, in the reviewed studies, key factors were not uniformly identified for assessment, nor is there a standardized program evaluation procedure for following best practices and determining assessment/intervention effectiveness (Hiller, et al., 2009; MSCA, 2008; NHTSA, 2011; Vlavianos et al., 2014;).

Another area of concern relates to the growing adoption, integration, and evolution of onsite DWI Court developed ad hoc technologies and databases used in conjunction with pre-established SBIRT screening tools, as well as local, state, and federal electronic judicial records systems. Conceivably, the combining of established systems with custom onsite database technologies, raises issues of reliability, compatibility and usability, and concerns that a potential loss of data integrity could affect the quality of reporting, or lead to compromised DWI client information. In addition, because of the lack of standards, and the limited empirical evidence of their efficiency or security, new technology guidelines are being sought by a growing number of judicial systems and courts for the adopt SBIRT programs and models (Marsch, Carroll & Kiluk, 2014; Palfai, Saitz, Winter, Brown, Kypri, Goodness & Lu, 2014).

In 2014, the National Highway Traffic Safety Administration published a study based on State-specific data from 2007 to 2011 (see Table 1). In the study, yearly State data was aggregated to calculate the conviction and recidivism prevalence, with 22 of the 50 States and Puerto Rico matching the study's set criteria based on data regarding arrests, convictions, and license suspensions. From the information obtained, the NHTSA estimated that one-quarter of all drivers arrested or convicted of driving while intoxicated were repeat offenders, and that repeat offenders in general are high risk problem drinker drivers. The same study showed that intoxicated drivers with prior DWI convictions maintained 4.1 times the risk of being involved in a fatal crash as intoxicated drivers without prior DWIs. DWI recidivism ranged from 11 to 69%, the median was 29.5%, and the weighted mean was 30%. Pennsylvania had the highest percentage of repeat DWI offenders with 69%, and Mississippi had the lowest percentage of DWI offenders with 11%. Minnesota tied Indiana with 43% recidivism (NHTSA, 2014).
Currently, screening for alcohol use problems and referral to treatment processes within the criminal justice system varies widely between counties and states (Dugosh, Festinger & Marlowe, 2013; Voas, DuPont, Talpins & Shea, 2011). Often, screening of DWI clients is not begun until after adjudication, which may take months or even years (Lapham, 2005), delaying the identification of those in need of treatment. Considering the high rates of recidivism and the cost to public safety, screening DWI clients for patterns of alcohol use and abuse soon after arrest might help to prevent recidivism.

There exists extensive evidence from previous review studies (Babor, McRee, Kassebaum, Grimaldi, 2007; Kaner, Dickinson, Beyer, Pienaar, Schlesinger & Campbell, 2009) as well as meta-analyses of randomized clinical trials (Beich, Thorsen & Rollnick 2003; Bertholet, Daeppen, Wietlisbach, Fleming & Burnand, 2005) that show the effectiveness of SBIRT in reducing hazardous drinking in individuals in primary care and other healthcare settings. In addition, U.S. Preventative Services Task Force (USPSTF) recommends that "behavioral counseling interventions for risky/harmful alcohol use among adults can provide an effective public health approach to reducing problematic drinking" (USPSTF, 2004). It was also determined that

State	# of Drivers Convicted of DWI	# of Drivers With Prior DWI Arrests	Year	Percent Repeat DWI Offenders	Look-Back Period (Years)
AZ	115,979	24,308	2007–2011	21%	7
CA	498,347	131,284	2007–2009	26%	10
CT	21,044	4,260	2007–2011	20%	10
DE	19,723	5,086	2007–2011	26%	10
FL	194,872	50,422	2007–2011	26%	100
GA	184,224	61,031	2007–2011	33%	Lifetime
IA	79,549	28,230	2007–2011	35%	5
IL	73,836	9,334	2007–2010	13%	Lifetime
IN	151,222	64,450	2007–2011	43%	Lifetime
MN	137,029	58,473	2007–2011	43%	Lifetime
MO	87,021	18,634	2007–2011	21%	10
MS	135,393	15,451	2007–2011	11%	5
MT	33,727	5,730	2007–2011	17%	25
NE	55,008	20,861	2007–2011	38%	12
ND	15,103	5,453	2009–2011	36%	7
OH	224,428	76,033	2007–2011	34%	6
OK	42,955	16,073	2007–2011	37%	10
OR	31,525	6,664	2007–2009	21%	10
PA	74,051	50,883	2008–2010	69%	20
SC	57,334	31,698	2007–2011	55%	10
UT	37,204	15,761	2007–2011	42%	10
VA	148,915	24,191	2007–2011	16%	5
Median		29.5%			
Weighted Mean		30%			
Range		11–69%			

Table 1, Recidivism rates of drivers convicted of DWI in 22 States (NHTSA, 2014).

"counseling for risky drinkers should include advice to reduce current drinking; feedback about current drinking patterns; and explicit goal-setting, usually for moderation and assistance in achieving the goals" (USPSTF, 2004). Despite these meta-analyses and review studies, there exists limited research that deals specifically with the effectiveness of self-guided, web-based/computer assisted screening tools, particularly in the context of a DWI Court.

As mentioned, of the few previous relevant studies (Hiller, et al., 2009; MSCA, 2008; NHTSA, 2011), several of them maintained short follow-up windows, not allowing sufficient time for recidivism to occur and be detected. Again, recidivism rates have a tendency to to be lower for several months after the arrest, particularly when the clients are still under the supervision of a DWI Court or probation agency. Given the strength of the data gleaned from Minnesota's Sixth District DWI Court's SBIRT long term pilot program, its use in a comparative review study of the feasibility, reliability, and usability of its SBIRT program for DWI clients would be timely and appropriate.

Additionally, Minnesota's Sixth District DWI Court's SBIRT pilot program uses the AUDIT "self-report" and "interview versions" screening tools (see Appendix A) in combination with a self-developed ad hoc database to assesses alcohol use characteristics, and to generate a personalized feedback report. The feedback report can then be used by staff to deliver a brief motivational intervention and provide a referral to treatment (Olson, 2015; Ryan, 2014). The aim of this review study will be to examine the compatibility, reliability, and usability of the implemented computer-assisted SBIRT system, and its benefits to DWI clients. This feasibility study will:

- Examine the usability of the onsite DWI Court developed ad hoc technologies and databases by assessing the counselor's and staff's perceptions of ease-of-use, time, aesthetics, and comprehension.
- Examine the compatibility of the onsite DWI Court developed ad hoc technologies and databases with the established local, state, and/or federal electronic judicial records systems through an in-depth systems analysis, and define a set of key factors related to service needs.
- Examine the integrity and security of the onsite DWI Court developed ad hoc technologies and databases, and define a set of key factors related to service needs.

Literature Review

This section defines the individual components, and reviews the evidence supporting the general efficiency of screening, brief intervention, and referral to treatment (SBIRT), as well as examining its specific effectiveness of SBIRT in relation to alcohol misuse, abuse, and prevention.

Background on the Study

SBIRT was initially designed to work as a public health model for common screening, secondary prevention (identifying unsafe or dangerous substance use before the onset of abuse or dependence), early intervention, and treatment for individuals with challenging or risky alcohol issues in the context of initial or primary healthcare sceneries (Babor et al., 2007; Babor & Higgins-Biddle, 2001). Based on the Substance Abuse and Mental Health Services Administration (SAMHSA) model, SBIRT is more dynamic because of its general screening of all individuals irrespective of any specific disorders, permitting identification and treatment of a wide spectrum of such behavioral health problems, regardless of whether the individual is "actively seeking an intervention or treatment for his or her problems" (SAMHSA-HRSA,

2016, p. 14).

To meet the SAMHSA definition of a "comprehensive SBIRT model," the system needs to include or reflect the following six specific characteristics (SAMHSA-HRSA, 2016):

1. Brief – The initial screening is accomplished in 5-10 minutes; the intervention and treatment components are completed in meaningfully less time than traditional substance abuse specialty care.
2. Universal Screening – The individuals, clients, students, or other target populations are all screened as part of the standard intake process.
3. One or more Targeted Behaviors – The screening tool speaks to a specific behavioral characteristic considered to be challenging, or pre-conditional to substance dependence.
4. Non-Substance Abuse Treatment Setting – This may be an emergency department, primary care physician's office, school, etc.
5. Comprehensive Model – The program includes a continuous changeover concerning brief complete screening, a brief intervention and/or brief treatment, and referral to specialty substance abuse care.
6. Research or Experiential Evidence Based Model – At the least, the programmatic outcomes must demonstrate a successful approach.

General Effectiveness. The comprehensive SAMHSA model of SBIRT is research based and founded on a model from the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism. Although there is substantial research on the effectiveness of SBIRT in reducing risky alcohol consumption, the evidence for the efficiency of SBIRT in lowering risky drug use is still being collected, and the findings are inconsistent depending on the specific attributes of the provider, the relative setting, and the client population involved in relevant SBIRT implementation (SAMHSA-HRSA, 2016). Additionally, even though there is strong evidence for screening and referral for depression, there remains little practical evidence for adopting wide-ranging "SBIRT-like" models for commonly reported mental health issues. There is also no research that has demonstrated the implementation or effectiveness of "SBIRT-like" models in addressing trauma or anxiety disorders in primary care situations (Hrouda, Delos & Keating, 2015; SAMHSA-HRSA, 2016).

Moreover, specifically as a comprehensive approach, the SAMHSA SBIRT model has been demonstrated to be effective for both risky alcohol use, as well as harmful drinking when delivered by a qualified health professional (Harris, Louis-Jacques & Knight, 2014; Kahan, Wilson & Becker, 1995; Wilk, Jensen & Havighurst, 1997). Although the results vary to a degree by provider, setting, and patient population, there is also a mounting body of literature showing the effectiveness of SBIRT for risky drug use (Bernstein et al., 2005; Quinn, Brolin, Stewart, Evans & Horgan, 2016; Saitz, Svikis, D'Onofrio, Kraemer & Perl, 2006;).

To determine the effectiveness of SBIRT beyond alcohol, a comprehensive literature review was conducted by the U.S. Department of Health and Human Services (HHS, 2015), which included SBIRT-like models as not only simple screening tools, but also as suitable and brief intervention models. Table 1 identifies the substance abuse and mental health conditions where

SBIRT or components of SBIRT have been employed. The Department of Health and Human Services' literature review did not include studies that dealt with SBIRT for unrelated medical conditions such as blood pressure, HIV/AIDS, or other behavioral issues such as domestic violence.

In Table 2, a brief analysis of the evidence for the effectiveness of SBIRT for various behavioral health conditions is presented, and the effectiveness of each component in relation to each behavioral health condition is rated as being either having sufficient evidence for the "Effectiveness / Utility of the Component" (✓); demonstrated to show "Promising Results" (*); or, "Not Demonstrated" and/or "Not Utilized" (—) (HHS, 2015).

	Screening	Brief Intervention	Brief Treatment	Referral to Treatment	Evidence for Effectiveness of SBIRT
Alcohol Misue/Abuse	✓	✓	✓	✓	Comprehensive SBIRT effective
Illicit Drug Misuse/Abuse	✓	*	*	✓	Growing but inconsistent evidence
Tobacco Use	✓	✓	✓	✓	Effective brief approach consistent with SBIRT
Depression	✓	—	✓	✓	No evidence to date for depression
Trauma/Anxiety Disorders	✓	*	—	✓	No evidence to date for disorders trauma/anxiety

Table 2, Effectiveness of SBIRT for behavioral health conditions (HHS, 2015).

In reviewing effectiveness, Table 1 highlights several key points from the U.S. Department of Health and Human Services' literature review. First, the comprehensive SBIRT model has not reliably demonstrated as being effective in addressing anxiety problems, trauma, depression, or harmful or risky drug misuse; second, the review found the evidence for effectiveness of SBIRT for drug misuse is mounting, and there are also promising findings for care for depression; and third, effectiveness with the comprehensive SBIRT model has also been demonstrated for tobacco use.

SBIRT Specifics

AUDIT Screening Tool. The screening tool currently being used in the Sixth District DWI Court's SBIRT pilot program is the Alcohol Use Disorders Identification Test (AUDIT), a 10-item screening tool developed by the World Health Organization (WHO) as a simple method of assessing alcohol consumption, drinking behaviors, and alcohol-related problems. Both a clinician-administered version and a self-report version of the AUDIT (see Appendix A) are provided. Patients are encouraged to answer the AUDIT questions in terms of "standard drinks" (see Appendix B for definitions for standard drinks). Scoring an 8 or more is indicative of harmful or hazardous alcohol abuse. Although frequently used in healthcare settings,

AUDIT has been validated across genders and in a wide range of racial/ethnic groups and is well-suited for use in DWI Court settings.

With input from various alcohol intervention program staff and professionals, and using information from National Institute on Alcohol Abuse and Alcoholism (NIAAA), the Institute for Clinical Systems Improvement (ICSI) developed a client tool to use as a conversational aid and guide to alcohol content (see Appendix C). The structure of this tool echoes the structure of the SBIRT evidence based model: "it raises awareness of risky drinking behavior by conducting and discussing the AUDIT score; It educates about risky substance use by presenting and discussing risky behavior associated with substance use; It elicits motivations for change; and it provides a plan for change by determining supports to tap into as well as triggers to mitigate" (Institute for Clinical Systems Improvement, 2015). **Screening.** Universal screening helps categorize the proper level of services needed based on the patient's risk level.

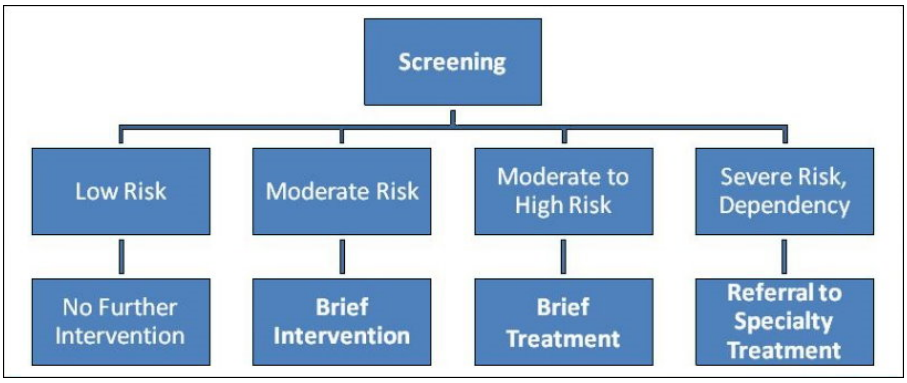

Figure 1. Flow chart for SBIRT process (SAMHSA-HRSA, 2016).

Intervention may not be needed on individuals with little or no risky behavior, and received a low screening score. Individuals with moderate risky behaviors and/or receive a moderate screening score may be referred to brief intervention. Individuals with a high risk score may need either a brief treatment or further assessment and long term specialty treatment. On average, screening takes 5 to 10 minutes and may be repeated as needed to track variations in the individual's progress over time. Common screens for the implementation of SBIRT for alcohol and drug use include (Smith, Schmidt, Allensworth-Davies & Saitz, 2010):

- The Alcohol Use Disorders Identification Test (AUDIT)
- Drug Abuse Screening Test (DAST)
- Alcohol, Smoking, Substance Involvement, Screening Test (ASSIST)
- Cut Down, Annoyed, Guilty, Eye-Opener (CAGE)

In addition, research has shown the use of web-based and computer assisted interventions to be effective in expanding and supplementing the advances made through the more conventional brief interventions. It has been shown that electronic methods can enhance brief interventions with DWI clients by offering assessments and feedback in brief "motivational interviewing"; monitoring individual's treatment advancement; and, post-intervention tracking (Williams, 2010; Cucciare, 2009; Van DeMark, Burrell, Lamendola, Hoich, Berg & Medina, 2010).

Effectiveness with Alcohol Misuse, Abuse, and Prevention. Multiple studies support screening and brief intervention as effective universal and selective prevention strategies for alcohol problems. Universal screening with educational content, and accompanying feedback, has measurable prevention effects (Kunz, French, Bazargan-Hejazi, 2004). This approach to prevention may also be useful with abstainers and non-risky drinkers by providing behavioral support and information to help maintain healthy behaviors. In the context of at-risk individuals, early identification and brief intervention focusing on false expectancies, misconceptions of normal use, and skill acquisitions can prevent advancement to severe drinking problems. For example, BASICS (Brief Assessment, Screening, Intervention, and Continuum of Care System) and SBIs programs (Screening & Brief Interventions) are consistent with the SAMHSA SBIRT approach, and have shown effectiveness in addressing risky drinking by integrating "motivational interviewing" components (Miller, 2002) that are also integrated in brief treatment for higher risk individuals. SBIs have demonstrated effectiveness in reducing overall drinking and binge drinking (Casset, Bérenger, Bosson & Lacroix, 2008; Hanewinkel & Wiborg, 2005; Heather, Dallolio, Hutchings, Kaner & White, 2004; Kunz Jr. et al., 2004; Martens, Cimini, Barr, Rivero, Vellis, Desemone & Horner, 2007; Toumbourou, Stockwell, Neighbors, Marlatt, Sturge & Rehm, 2007; Murphy, Duchnick, Vuchinich, Davison, Karg, Olson, Smith & Coffey, 2001).

Brief Intervention (BI) and/or Brief Treatment (BT). A BI on average involves one to five sessions lasting anywhere from five minutes to an hour, has the primary goals of educating individuals and increasing their motivation to reduce risky behavior. Most individuals report minimal issues with drugs or alcohol and, as such, are usually ideal for primary or universal prevention activities for maintaining non-risky use or abstinence.

On the other hand, the primary goal of brief treatment (5-12 sessions) is to modify current behavior and address long-term issues with harmful drinking and drug abuse. Those referred to a BT frequently have higher risk factors than individuals directed to a BI. Brief treatment may also require a "manualized course of (advanced) motivational enhancement and cognitive behavioral approaches" to help individuals address unhealthy perceptions and behaviors and implement change strategies (Smith et al., 2010, p. 1157). In some cases, an individual may receive a BI first and then move on to a brief treatment or longer term care.

Research has demonstrated that the means of universal screening, brief intervention and treatment, and referral to treatment for alcohol disorders is effective in various healthcare settings, and for a largely diverse patient populations, including for primary care (Babor et al., 2007), emergency departments (Gentilello, Donovan, Dunn & Rivara, 1999), as well as educational institutions (O'Brien, McCoy, Champion, Mitra, Robbins, & Teuschlser, et al., 2006). Data are currently being collected that suggest that SBIRT may also be effective in addressing alcohol problems in employee benefit programs (Quinn et al., 2016). Additional research demonstrates the efficacy of holding screenings and BIs using innovative strategies such as the use of personal feedback (Quinn et al., 2016; HHS, 2015; Cunningham, 2010), as well as web-based monitoring to support treatment decisions and cognitive behavioral techniques (Quinn et al., 2016; Roy-Bryne, 2010).

Referral to Treatment (RT). Referral to treatment is recommended when individuals meet the diagnostic measures, "scoring in the problematic range," for substance dependence (SAMHSA-HRSA, 2016). Although only 3% to 4% of screened individuals in primary care situations characteristically need to be referred, the lack of a proper treatment referral in effect prevents the

patient from accessing "appropriate and timely care that can impact other psychosocial and medical issues" (Smith et al., 2010, p. 56). Research findings suggest that "motivation-based" brief interventions can increase individual involvement and retention in referred treatment (Hillman et al., 2001; Dunn & Ries, 1997). The Substance Abuse and Mental Health Services Administration requires institutions adopting the SBIRT model to have a "comprehensive referral to treatment and follow-up system" well established for the length of the program (SAMHSA-HRSA, 2016).

It should also be noted, according to the Substance Abuse and Mental Health Services Administration, RT is an inherently complex process involving the synchronization of multiple services and care providers. When considering the challenges of integration and adaptation of various technologies (interactive web-based, computer, mobile, etc.) by multiple services and care providers, non-compatible data systems, or missing linkages, can be a substantial barrier to treatment referrals and an effective adoption of SBIRT.

Summary

In the context of alcohol misuse and abuse, the above foundational material defines the individual components, and reviews the evidence supporting the general effectiveness of screening, brief intervention, and referral to treatment (SBIRT) in a DWI court. More specifically the evidence-based literature identifies the following characteristics of SBIRT as key factors to take into consideration when adopting or reviewing a DWI program.

1. Brief, universal screening tools. In the context of alcohol misuse and abuse, screening tools accurately identify individuals with challenging conditions in a relatively short amount of time. Because of its brevity and its universal use (that is, can be used with all individuals), SBIRT may be more generally accepted by both criminal and DWI court professionals.
2. Relatively easy to adopt by diverse providers. The SBIRT models have shown to be relatively easy to adopt when compared to other behavioral treatments that may necessitate prolonged specialized training, allowing the SBIRT to be used by diverse professionals and in various locations.
3. Incorporation of synchronized and compatible technologies. Screening, brief intervention, and referral to treatment is a complex process involving coordination across different types of services and technologies. As such, conflicting or non-compatible systems can be a significant barrier to the adoption of SBIRT.

Overall, the evidence supporting DWI Court SBIRT programs is growing. Yet, the design quality of some research brings into question how well SBIRT may be translated into alcohol misuse, abuse, and long-term recidivism settings. There is a great need for more effectiveness trials, which use comparison groups to determine how much the brief intervention adds to positive alcohol use outcomes. SAMHSA has initiated a number of SBIRT programs to test the feasibility and effectiveness of these programs across a wide variety of sites, settings, and demographic populations, but few of these have used adequate long-term control groups for comparison. Considering its potentially strong analytic data, the adopted technologies, and its adherence to the SAMHSA definition of a comprehensive SBIRT model, an effectiveness evaluation of the Minnesota's Sixth District DWI Court's pilot SBIRT program is in order. To help ensure a high quality research design and adequate statistical power, the following steps and conditions need

to be met:

1. The researchers must first conduct a process evaluation to ensure Minnesota's Sixth District DWI Court's pilot SBIRT program is in compliance with the *Ten Guiding Principles of DWI Courts* (NCDC, 2006) and meet the SAMHSA definition of a comprehensive SBIRT model (SAMHSA-HRSA, 2016).
2. The participants will be followed for at least 1 year from entry, which provides adequate time for recidivism to happen and be detected by law enforcement or corrections.
3. The sample sizes will be large enough to provide adequate statistical power for the data analyses.

Discussion

Implementation, Methods and Evaluation

This section will summarize the implementation process, as well as the methodologies and analytics of this twofold investigation, outlining: (1) a comparative analysis of Minnesota's Sixth District DWI Court's DWI client recidivism rates; and, (2) a feasibility, usability, and reliability study of the Sixth District DWI Court's implemented computer-assisted SBIRT pilot program system. In both cases, in reviewing the established technologies and existing long-term data from Minnesota's Sixth District DWI Court's pilot SBIRT DWI program, descriptions of the necessary steps and conditions for positive outcomes and quality research design will be provided.

Recidivism Rates. The first part of this twofold investigation is a descriptive, quantitative, quasi-experimental study of high/low recidivism rates between SBIRT DWI clients (experimental group) and non-SBIRT DWI clients (control group) in Minnesota's Sixth District DWI Court. The objective is to gain an understanding of the effectiveness and success of the Sixth District's DWI Court in relation to the recidivism rates of its pilot SBIRT program's enrolled DWI clients.

A quasi-experimental design will be used because with the pre-existing data, random assignment is not possible, and alternative routes must be used to lessen the initial differences between the DWI treatment groups. The dependent variables for this study will be client recidivism rates and SBIRT participation. The primary independent variables for this study are the pre-program assessments in DWI client alcohol audits, client readiness, and client psychopathy. A second set of primary independent variables are demographics (age, sex, and ethnicity), and contributing factors (e.g., homelessness, substance abuse, mental health, unemployment, criminal associates, etc.).

Comparison testing will involve the experimental and control groups' long-term data, and examining high versus low recidivism rates, alcohol audits, readiness, psychopathy, and possible contributing factors. Analysis will involve t-tests both for the difference between independent (uncorrelated) means, and for the significance of difference between correlated means. The t-test for uncorrelated means will examine the variance of the mean using the independent variables, and indicate any significant differences between the control group and the experimental group. The t-test for correlated means will compare the pre- and post-

program variables of the DWI clients enrolled in the SBIRT pilot program.

At the beginning of the study's implementation, a baseline comparison of the experimental and control groups will need to be made using chi square tests and the earlier described t-tests. The chi square tests, will look for group composition similarities on the contributing factors and demographic variables.

In addition, an analysis of covariance will also need to be conducted in an experimental pre-SBIRT/post-SBIRT design, in an effort to equate the experimental and control groups on sets of relevant variables. It should be noted that, along with recidivism levels, demographics and contributing factors, relevant causal variables will need to be identified, and may include alcohol audits, readiness, and psychopathy.

Feasibility of SBIRT Technologies. The second part of this twofold investigation is a review and feasibility study of the compatibility, reliability, and usability of the Sixth District DWI Court's onsite-developed ad hoc technologies and databases. Data will be gathered both from program counselors and staff, as well as through an in-depth systems analysis, and a defining of key factors related to service and security needs.

This feasibility study will examine the usability and the reliability of the DWI Court's onsite database and will include a usability and satisfaction questionnaire for the program counselors and staff that focuses on their perceptions of ease-of-use, time, aesthetics, and comprehension; one-on-one and team interviews with program counselors and staff; and a reliability, compatibility, and security review of the onsite SBIRT data management system.

The key database feasibility factors to be focused on will be:

1. Operational feasibility and counselor/staff usability – Take inventory of currently available skills and create a list of the skills needed for the onsite DWI Court client database system; review the list of people with specialized skills; make recommendations for training and use.
2. Technological feasibility in reliability – Monitor database performance through gathering of statistics; tune indexes; tune queries; tune the schema; perform schema changes at all levels for ongoing use and enhancements.
3. Technological feasibility in compatibility – Examine the compatibility of the onsite DWI Court developed ad hoc technologies and databases with the established local, state and/or federal electronic judicial records systems through an in-depth systems analysis, and define a set of key factors related to service needs.
4. Technological feasibility in security – Maintain an accurate inventory of all relevant databases deployed and identify all sensitive data types residing on those databases; assess, identify, and remediate vulnerabilities that expose the database; identify user entitlements and recommend user access controls and privileges to limit access to only the minimum data required for select individuals; recommend appropriate policies and types of monitors for any weaknesses that cannot be remediated for any and all activity that deviates from authorized activity.

Limitations and Future Research

As a comparative analysis of Minnesota's Sixth District DWI Court's client recidivism rates, this will be drawing from a limited sample at a single DWI Court setting; further, the feasibility review of technologies will be specific to those directly involved in the DWI Court's onsite ad hoc SBIRT technologies and databases. Future work studying recidivism rates and technologies will need to be powered to detect differences in relevant judiciary and clinical outcomes and to occur in a broader range of DWI clients and settings for greater generalizability. The length of the pilot program, even though relatively long, may limit the detection of recidivism and intervention for some DWI clients, particularly those who enrolled toward the end of sample times. Other considerations involve the technology feasibility review and may include variations in equipment (e.g., desktops, laptops, Macs, PCs, etc.); the need for a robust Internet connection; and the need for periodic hardware and software updates. Future work will be needed not only to address efficacy but to estimate the incremental cost of incorporating standardized hardware and software into the program.

Finally, the study findings may also be limited by selection bias. As mentioned earlier, with the use of pre-existing data, random assignment is not possible. In addition, this study is focuses on alcohol misuse, and is limited applicability to the general population with substance use disorders. Future work on using broader sets of populations engaged in drug and alcohol use may identity those most likely to benefit from SBIRT program interventions or provide information on further development work to address group-specific needs.

Conclusion

While there is considerable research for the effectiveness of SBIRT in reducing unhealthy alcohol use through healthcare services, the evidence for similar models used in addressing alcohol misuse, abuse, and prevention in the DWI Court system is still being developed. As such, to test the feasibility and effectiveness of these programs across a wide variety of sites, settings, and demographic populations, the SAMHSA has helped initiated a number of SBIRT programs similar to Minnesota's Sixth District DWI Court's pilot SBIRT program. One major challenge in reviewing the success of these programs is the lack of adequate long-term data to help assure the validity and repeatability of this phenomena.

Again, considering its potentially strong analytic data, its adopted technologies, and its adherence to the SAMHSA definition of a comprehensive SBIRT model, an effectiveness evaluation of the Minnesota's Sixth District DWI Court's pilot SBIRT program is in order. And again, this study is important not only because it can help determine the effectiveness of the Minnesota's Sixth DWI Court's program in reducing recidivism, but can possibly supply supporting evidence for development or restructuring of other SBIRT programs in similar judicial systems.

Again, like the Sixth District's DWI Court's pilot program, numerous other screening and intervention programs in various settings and populations have recently begun to identify themselves as "SBIRT programs." But unlike the Sixth District's, most of these programs do not meet the criteria defined in this paper to be designated as an all-inclusive SBIRT model; Minnesota's Sixth District DWI Court's pilot SBIRT program is research-based, is consistent with

the terminology and definitions with what constitutes a true SAMHSA SBIRT model, and offers a more direct and balanced approach that identifies and caters to the specific needs of first time and multiple time DWI clients.

In considering the future of the pilot SBIRT program adopted by Minnesota's Sixth District DWI Court, an effectiveness evaluation is critical, and should include examination of both a statistical analysis of recidivism events for a sufficient period of time (at least 1 year), as well as a feasibility, usability, and reliability review of its computer assisted assessment tools and onsite database.

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APPENDIX A:

The SBIRT AUDIT Screening Tool

The Alcohol Use Disorders Identification Test: Self-Report Version

PATIENT: Because alcohol use can affect your health and can interfere with certain medications and treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest. Place an X in one box that best describes your answer to each question.

Questions	0	1	2	3	4	
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week	
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
8. How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9. Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year	
					Total	

(Source: Substance Abuse and Mental Health Services Administration, December 2016)

The Alcohol Use Disorders Identification Test: Interview Version

Read questions as written. Record answers carefully. Begin the AUDIT by saying "Now I am going to ask you some questions about your use of alcoholic beverages during this past year." Explain what is meant by "alcoholic beverages" by using local examples of beer, wine, vodka, etc. Code answers in terms of "standard drinks". Place the correct answer number in the box at the right.

1. How often do you have a drink containing alcohol?
   (0) Never [Skip to Qs 9-10]
   (1) Monthly or less
   (2) 2 to 4 times a month
   (3) 2 to 3 times a week
   (4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?
   (0) 1 or 2
   (1) 3 or 4
   (2) 5 or 6
   (3) 7, 8, or 9
   (4) 10 or more

3. How often do you have six or more drinks on one occasion?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily
   Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0

4. How often during the last year have you found that you were not able to stop drinking once you had started?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?
   (0) No
   (2) Yes, but not in the last year
   (4) Yes, during the last year

10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?
    (0) No
    (2) Yes, but not in the last year
    (4) Yes, during the last year

Record total of specific items here

If total is greater than recommended cut-off, consult User's Manual.

(Source: Substance Abuse and Mental Health Services Administration, December 2016)

APPENDIX B:

The Institute for Clinical Systems Improvement's

Client Tools and Conversational Aids

STANDARD DRINK EQUIVALENTS	APPROXIMATE NUMBER OF STANDARD DRINKS IN:
BEER or COOLER	
12 oz. **~5% alcohol**	12 oz. = 1 16 oz. = 1.3 22 oz. = 2 40 oz. = 3.3
MALT LIQUOR	
8-9 oz. **~7% alcohol**	12 oz. = 1.5 16 oz. = 2 22 oz. = 2.5 40 oz. = 4.5
TABLE WINE	
5 oz.  **~12% alcohol**	a 750 mL (25 oz.) bottle = 5
80-proof SPIRITS (hard liquor)	
1.5 oz.  **~40% alcohol**	a mixed drink = 1 or more* a pint (16 oz.) = 11 a fifth (25 oz.) = 17 1.75 L (59 oz.) = 39 *Note: Depending on factors such as the type of spirits and the recipe, one mixed drink can contain from one to three or more standard drinks.

(Source: Institute for Clinical Systems Improvement, December 2016)

A Healthier You

Small changes can make a big impact

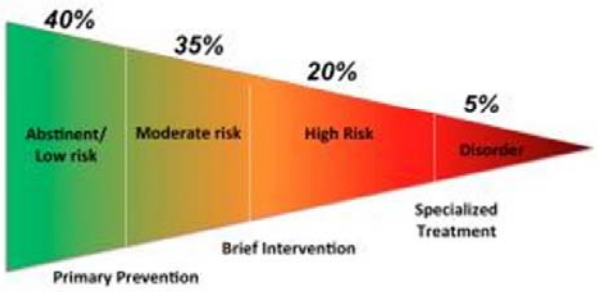
The graphics below illustrate the patterns of drinking behavior in the U.S., what constitutes a standard drink size, and low-risk drinking limits. Understanding your alcohol use can help in thinking about change.

MY AUDIT SCORE_____

AUDIT Score Scale:

8 or more (7 in women) may indicate strong likelihood of harmful consumption.

More than 15 (13 in women) may suggest alcohol dependence.



KNOW THE LOW-RISK GUIDELINES

BLOOD ALCOHOL CONTENT (BAC)
Table for Male (M) / Female (F)

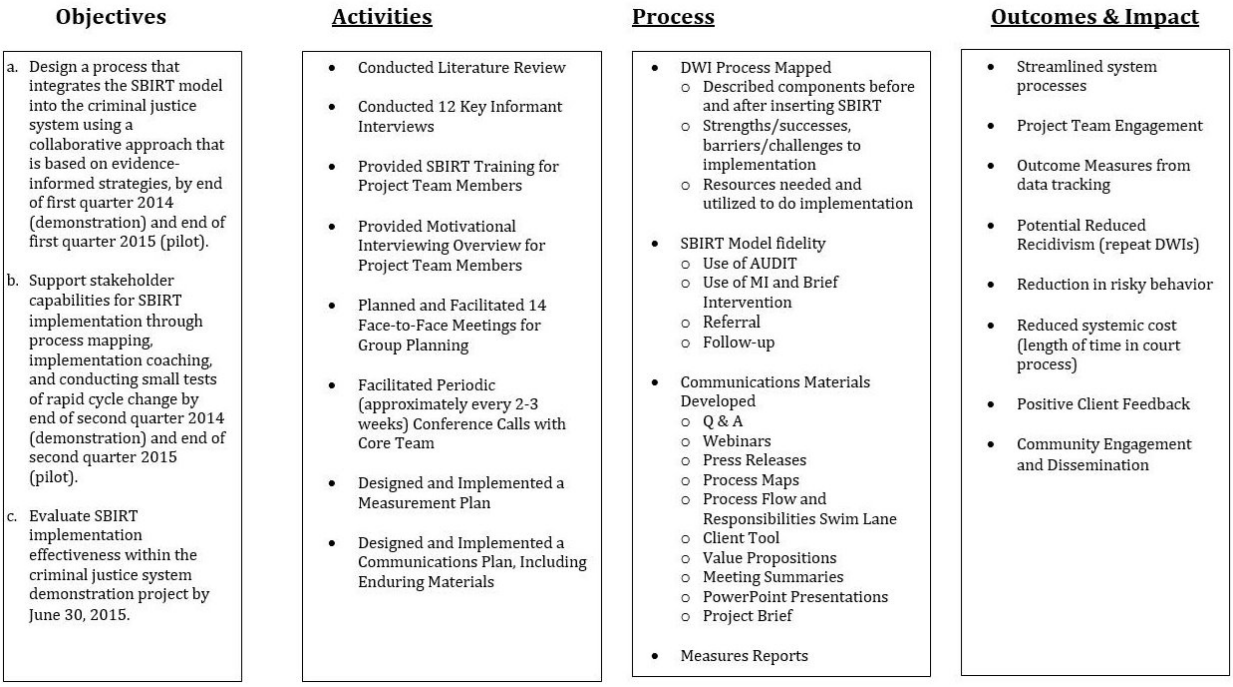
Number of Drinks		Body Weight in Pounds								Driving Condition
		100	120	140	160	180	200	220	240	
0	M	.00	.00	.00	.00	.00	.00	.00	.00	Only Safe Driving Limit
	F	.00	.00	.00	.00	.00	.00	.00	.00	
1	M	.06	.05	.04	.04	.03	.03	.03	.02	Driving Skills Impaired
	F	.07	.06	.05	.04	.04	.03	.03	.03	
2	M	.12	.10	.09	.07	.07	.06	.05	.05	
	F	.13	.11	.09	.08	.07	.07	.06	.06	
3	M	.18	.15	.13	.11	.10	.09	.08	.07	
	F	.20	.17	.14	.12	.11	.10	.09	.08	Legally Intoxicated
4	M	.24	.20	.17	.15	.13	.12	.11	.10	
	F	.26	.22	.19	.17	.15	.13	.12	.11	
5	M	.30	.25	.21	.19	.17	.15	.14	.12	
	F	.33	.28	.24	.21	.18	.17	.15	.14	

Subtract .01% for each 40 minutes of drinking.
1 drink = 1.5 oz. 80 proof liquor, 12 oz. 5% beer, or 5 oz. 12% wine.
Fewer than 5 persons out of 100 will exceed these values.

(Source: Institute for Clinical Systems Improvement, December 2016)

APPENDIX C:

The SBIRT for DWI Process Evaluation Logic Model



(Source: Institute for Clinical Systems Improvement, December 2016)