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**Implementing SBIRT in a Critical Access Emergency Department**

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### Abstract

Universal screening and brief intervention with referral to treatment (SBIRT) has become best practice for emergency departments (EDs) over the last two decades. For many patients the ED may be their primary contact with the healthcare system. Given the prevalence of alcohol use and the subsequent health impacts of drinking, EDs are well positioned to be on the front line of screening for risky drinking. The available literature is clear in its consensus that universal screening for alcohol use in the ED is critical to identifying people at high risk for drinking and improving health outcomes.

#### *Aims*

This project aimed to implement an SBIRT process in a critical access ED. To achieve this global aim, the project team developed an SBIRT process and educated nurses and providers on its use in the department.

#### *Methods*

The project team performed a two-month retrospective chart review to determine the baseline rate of alcohol screening in the department. Patients younger than 13, critically ill, or unable to answer screener questions were excluded from the chart review. Unit nurses and providers were educated on use of SBIRT with various modalities. Staff were given surveys to complete before and after the educational materials were distributed to assess their knowledgebase. After implementation, a two-month chart review measured staff usage of the new SBIRT process.

#### *Results*

Over the two-month implementation period, the percentage of patients in the ED screened for alcohol use increased from an average of sixty-five percent before the intervention to seventy-nine percent after.

#### *Conclusions*

Increased alcohol screening for patients in a critical access ED is possible with the necessary education and buy in from clinical staff. Although nurses accepted the premise and importance of screening based on survey results, they were not likely to use screener tools that were new and/or inconvenient. The existing electronic

screener tool was widely preferred to the newer, paper AUDIT\_C tool. Embedding the new screener tool in the electronic chart may be a way to increase convenience and therefore its adoption.

Keywords: Nursing intervention, SBIRT, alcohol use disorder, quality improvement, emergency department alcohol screening.

## Introduction

In the United States, an estimated 2.5 million emergency department (ED) visits each year are directly related to alcohol use (Hawk, 2018). This statistic does not account for the patients with alcohol use disorder (AUD) who present to the ED for complaints unrelated to alcohol. Emergency departments often function as a frontline of care for many adults who may not have access to primary care or are uninsured. Because of the ED's unique function as a frontline center for care, there is much potential to implement primary prevention for AUD. Primary prevention of AUD is often accomplished using a screening and brief intervention with referral to treatment (SBIRT) model. The screening and brief intervention with referral to treatment protocol has been used in emergency departments in many hospitals over the past two decades with promising results. When successfully implemented, the SBIRT has the potential to reduce hazardous alcohol use and prevent future ED visits (Hawk, 2018). Although the SBIRT model includes referral to treatment, even the implementation of just the screening and brief intervention has been shown to be effective at reducing hazardous alcohol use (Loon et al., 2017). The benefit of the SBIRT is that it is designed to be a brief and efficient intervention that can be implemented in busy environments where staff have limited time.

## Problem Description

It is estimated that 40 million Americans meet the criteria for heavy alcohol drinking (Love, 2008). As many as one in seven emergency department patients report heavy alcohol use (Fernandez et al., 2018). Alcohol use is very prevalent in the United States, and it is the direct and indirect cause of much morbidity. Barata et al.

(2017) report that heavy drinking is the fourth leading cause of preventable death in the United States. Hazardous alcohol use is currently defined as more than 14 drinks per week for men or seven drinks per week for women, or more than four drinks per day for men and three drinks per day for women (Alcohol Research Group, 2015). According to the National Alcohol Survey, 11% of men and 5% of women in the United States drink more than the levels established above (Alcohol Research Group, 2015).

The project implementation ED is located in Addison County, Vermont. In Addison County, 64% of people report having consumed alcohol in the last month. This is well above the national average of 53% (Vermont Department of Health, 2018). According to the AUDIT-C screening tool definition of heavy drinking, 12% of Addison County residents report heavy drinking, which is double the US national average of six percent (Vermont Department of Health, 2018). Based on this data, residents in Addison County are statistically at much higher risk for alcohol misuse.

Emergency departments often act as the only contact or entry point with the healthcare system for many adults in the US. There is an enormous opportunity for EDs to be a point of contact and intervention for people with alcohol use disorder (AUD). When emergency departments take advantage of this role by doing primary prevention, they can greatly impact patient outcomes and reduce associated long term healthcare costs (Hawk, 2018).

Currently, the project site emergency department does not consistently screen patients for alcohol use disorder (AUD). The current approach for intervention at the project implementation site is to intervene with patients who present as intoxicated or are explicitly seeking help with detox and withdrawal. In short, the current ED practice is to only intervene if alcohol is directly related to the visit itself. Interventions are nurse and provider dependent and there is no standardized alcohol screening tool currently in use. Similarly, providers do not use a standardized method for intervention for AUD. By implementing a standard, universal screening tool and procedure for brief intervention and referral to treatment (BIRT), there is an opportunity to reduce alcohol related morbidity and promote patient health. Screening all adult patients using a validated screening tool such as the

AUDIT-C and providing a brief intervention to those found to be at-risk for alcohol use disorder is considered best practice (Bacidore et al., 2017).

### Available Knowledge

Alcohol screening programs in the emergency department setting have major implications for patient alcohol consumption and overall long-term healthcare costs (Hawk, 2018). SBIRT style interventions have been shown to be very effective at reducing alcohol risk levels as measured by AUDIT-C scores of patients screened in the emergency department (Barata et al., 2017).

### *Screening*

There are many screening tools available for alcohol use however, the AUDIT-C tool is the most commonly used in studies of SBIRT in the emergency department setting (Bacidore et al., 2017). This tool is favored in ED settings because it is a very quick screener for staff to implement. The AUDIT-C tool is a short version of the more extensive AUDIT screener. The AUDIT-C tool is comprised of three questions that ask about weekly alcohol use, daily average use, and maximum daily use (US Department of Veterans Affairs, 2020). The tool is quick to use and identifies patients as either at-risk or not at-risk; a male score greater than 4 or a female score greater than 3 qualifies as hazardous drinking. If patients answer “no” to using alcohol at all, the interviewer can simply move on to other triage questions. The utility of screening patients at triage is to determine which patients can benefit from an intervention.

### *Brief Intervention*

According to current evidence, patients who screen positive for hazardous drinking with the AUDIT-C tool should receive a brief intervention from ED staff (Bacidore et al., 2017). The brief intervention part of SBIRT is usually done using principals of Motivational Interviewing (MI) (Barata et al., 2017).

The core principals of MI are:

“1. Asking for permission to discuss alcohol use.

2. Providing feedback on current drinking and consequences.
3. Assessing readiness to change.
4. Providing options to help with behavioral changes and assisting in obtaining appointments or placements if desired.” (Barata et al., 2017).

The brief motivational interview can take as little as 10 minutes in an ED setting (Bernstein et al., 2009). Successful implementation of SBIRT programs in EDs has shown significant reductions in patient alcohol use as evidenced by repeat AUDIT-C or other screening scores (Barata et al., 2017). Barata et al. reviewed 35 separate studies in a systematic review and found an overall 37% reduction in alcohol use among adult ED patients who received SBIRT. Van Loon et al., (2017) had very similar results in a randomized controlled trial in the Netherlands with a 35% of intervention patients either reducing or stopping alcohol consumption three months after their brief intervention. Overall reduction in alcohol consumption is not the only potential benefit of SBIRT programs; this type of intervention has cost saving potential as well. Pringle et al. (2018) conducted a retrospective study of total healthcare costs before and after an SBIRT intervention and found a 21% reduction in costs. This same study found that patients who receive a brief intervention in the ER had a 3.3% reduction in future ED visits for up to three years and a 4.1% reduction for inpatient stays (Pringle et al, 2018).

Two interventions are part of best practice for alcohol screening and intervention according to a systematic review by Barata et al., 2017; first, screening for alcohol use and second, a brief intervention, usually in the form of a motivational interview. Even if the intervention does not include referral to treatment, patients who receive Motivational Interviewing related to alcohol use in the ED are likely to drink less and have fewer negative outcomes as a result of alcohol use in the months after their visit (van Loon et al., 2017). In a study conducted in the Netherlands 35% of participants had lower AUDIT- C scores after receiving a motivational interview in the ED 3 months post visit (van Loon et al., 2017).

Although SBIRT traditionally refers to three steps - screening, intervention, and referral - several studies have shown the efficacy of just screening as a successful intervention for reducing alcohol use (van Loon et al., 2017). These authors found that patients who screened positive and never received their brief intervention still had

reductions in alcohol misuse three months later (van Loon et al., 2017). Merchant et al. (2017) found that the alcohol screening tool alone was enough of an intervention to reflect noticeable alcohol use reductions in patients three months after the ED discharge. This finding suggests that even having a patient consider their alcohol consumption via a screener tool can promote change.

Most of the available evidence supporting SBIRT involves ED staff delivering screener questions; however, some research has investigated the possibility of self-administered computerized screening. Self-administered computerized screener tools have an important potential role in the ED setting because of time constraints on staff. Several studies have compared the efficacy of both human intervention and computerized intervention and saw reductions in patient AUDIT-C scores up to a year out from a patient engaging with a self-administered computerized intervention (Fernandez et al., 2019).

There are many potential barriers to implementation of SBIRT programs in the ED setting but perhaps the most frequently cited barrier is time (Fernandez et al., 2019). Despite the time constraints in a busy unit, many EDs have implemented SBIRT protocols successfully and measured positive outcomes among the target population of patients.

### Rationale

Over the last decade universal alcohol screening for adults has steadily become best practice in the emergency department setting (Bacidore, 2020). Currently there is no routine screening for alcohol use in the project setting. The project setting is an emergency department in Addison County, Vermont. Addison County has a significantly higher rate of hazardous drinking than the national average (Vermont Department of Health, 2018). Twice as many residents in the county report heavy drinking in the last month than on the national level (Vermont Department of Health, 2018). Screening and referral to brief intervention (SBIRT) has been studied in the context of emergency departments and findings indicate this to be a useful tool for reducing absolute number of drinks consumed in the at-risk population (van Loon et al., 2017).



### Conceptual Model

Lewin's change theory will be used as a model of change for emergency department staff implementation of screening and brief intervention with referral to treatment (SBIRT) protocol. Lewin's theory states that there are three factors effecting change: driving factors, restraining factors, and equilibrium (Petiprin, 2020).

Equilibrium occurs when driving and restraining factors are equal. Change occurs when driving factors and restraining factors are adjusted out of equilibrium. The ED is a unit that has many driving factors including staff who genuinely want to provide evidence-based care to patients. There are also restraining factors at play in this unit including limitations on nurse and provider time and acuity of patients. Patients that are a higher acuity level may be less likely to be screened during triage due to distracting injuries, altered mental status, and time constraints. A lack of comfort with Motivational Interviewing techniques is another restraining factor. This project proposes to promote driving factors and limit restraining ones in order to create the change of staff use of the SBIRT protocol.

### Specific Aims

Aim 1: Screen and provide brief intervention to at least 60% of adult patients for alcohol use disorder in a critical access emergency department by 2022 using a combination of the AUDIT-C screening tool and Motivational Interviewing techniques as intervention.

Aim 2: Facilitate the intervention by providing an educational video outlining the screening and brief intervention (SBIRT) process, as well as its importance, for ED staff.

Aim 3: Implement nurse use of the AUDIT-C screening tool during triage to screen adult patients for alcohol use. For patients who screen positive under the national guidelines for AUDIT-C scoring, deliver a brief intervention in the form of a motivation interview.

Aim 4: Measure nurse and provider confidence in performing the SBIRT intervention using a brief five-question qualitative and quantitative survey.

### Context

The project setting is an 11 bed, critical access emergency department in a rural college town in Vermont. The unit sees an average of 30-40 patients in a 24-hour period and is staffed by one provider (MD) and two nurses overnight and two providers and up to four nurses during the day. The community is a small college town of 8,000 residents in rural Vermont (Census Bureau, 2019). The project implementation will take place in the summer and fall of 2021.

### Interventions

The project manager created a mandatory triage question in the electronic health record (EHR) regarding alcohol use. This mandatory question remained highlighted in the EHR until the triage nurse enters the appropriate information related to a patient's alcohol use. Any patient who reports drinking alcohol in the last month will receive a validated alcohol screening (AUDIT-C) from the triage nurse.

The project manager provided training for the use of a validated screening tool for alcohol use disorder. In this case, the validated tool was the AUDIT-C screener. AUDIT-C uses three question to determine if a patient is at risk for alcohol misuse. The screener tool was done on paper due to barriers with imbedding it into the EHR. Nurses completed the AUDIT-C tool during the triage assessment and notify providers of any patients who scored positive for hazardous drinking. Nurses also documented the AUDIT-C results in the electronic chart. A Section titled "AUDIT-C" was added to the electronic chart. The SBIRT process was targeted at patients over the age of 13 and excluded anyone who was unable to complete screening due to altered mental status, intubation, or life-threatening injuries. Patients with an Emergency Severity Index (ESI) score higher than 3 was also excluded. Any patient who meets these exclusion criteria was not screened for alcohol use.

The project also provided training for the staff on Motivational Interviewing techniques as well as information on the effectiveness of SBIRT in improving health outcomes for patients in the ED. This education was done both over a synchronous zoom meeting, PowerPoint presentation sent to staff over email, and in person coaching on the unit. The project manager was present on unit during all shifts throughout the first week of

implementation to educate staff and answer questions. A Motivational Interviewing quick reference sheet was provided to staff as a tool to guide interventions with patients. This tool was laminated and available in the both the nurses' station and provider's station.

If a patient screened positive for hazardous drinking (male score greater than 4, female score greater than 3) then the provider or nurse would initiate a brief intervention and referral to treatment (BIRT). Provider interventions and referrals will be documented in the EHR under the notes section. Emergency department providers referred patients who screened positive for alcohol misuse to primary care and case management for continuation of care.

### Study of the Interventions

To assess the impact of the SBIRT intervention, the project manager used chart review to establish a pre-intervention baseline of patients screened for alcohol use. Ten patient charts from each week of the eight-week pre-intervention period were selected for review. The eighty total charts selected were from different quarters of the twenty-four-hour day. The percentage of total patients screened during a two-month period prior to implementation of the intervention were compared to post-intervention percentage of patients screened, based on chart review. Post-intervention study used EHR chart documentation to measure both the use of the AUDIT-C screening and provider use of a brief intervention with patients who screen positive for hazardous drinking. Nurses and providers are expected to document both alcohol screening questions and use of brief intervention in the electronic chart. The actual AUDIT-C screening tool was completed on paper and stored with the patient's paper chart from that visit.

### Measures

Measures of effectiveness of implementation were based on percentage of adult patients screened and then interviewed by a provider before discharge. Percentage of adult patients screened was calculated by reviewing data entered into the electronic chart by nurses and providers. The percentage of adults screened for alcohol use prior to the intervention was measured for two months prior to implementation and then compared to a two-month

period after the intervention. Ten charts were selected from each week of pre and post intervention chart review for a total of eighty pre intervention and eighty post intervention charts reviewed. In an effort to capture a representative sample, each batch of ten charts was taken from different six-hour periods throughout the twenty-four-hour day. The post-intervention chart review investigated both the number of patients screened for alcohol use and the number of patients who receive a brief intervention.

To measure staff competency and comfort with the SBIRT process, nurses and providers took a short five question survey utilizing a Likert scale. The survey had subjective questions to assess emergency department staff understanding of and comfort with the intervention. This survey was given before the staff educational material on SBIRT and then again after the intervention. Pre- and post-intervention survey results were compared to measure the effectiveness of education materials.

### Analysis

Data analysis centered on comparing pre-intervention to post-intervention screening frequency using descriptive statistics. Pre and post intervention data was arranged in a run chart with a marker that designates the moment of intervention. This visually shows changes in the percentage of adult patients screened and those given a brief intervention. The data was broken into three categories: percentage of patients screened, daily census, and the one year ago average daily census.

Descriptive statistics and qualitative data from the staff survey questions were used to analyze staff understanding of the protocol and confidence in the use of Motivational Interviewing. The staff survey response scores will be averaged and graphed in a bar chart for each of the 5 questions. The pre-education response scores will be separated from the post-education response scores. This modality makes any changes in average responses visually apparent.

### Ethical Considerations

This quality improvement intervention has been reviewed by the University of Vermont IRB committee and deemed to not require further approval. The project setting hospital quality committee will be consulted prior

to the project implementation to ensure that it follows all hospital policies. Both the emergency department medical director and the nursing supervisor are aware of this project and will be part of the planned implantation.

## Results

The project intervention began with staff Zoom meetings in August 2020 with nurses and providers to introduce the project concept and answer questions from staff. One request from the staff meeting was that a Motivational Interviewing “quick reference” be provided to staff to assist with the intervention process. This “quick reference” would ideally act a reminder to staff of the process of Motivational Interviewing.

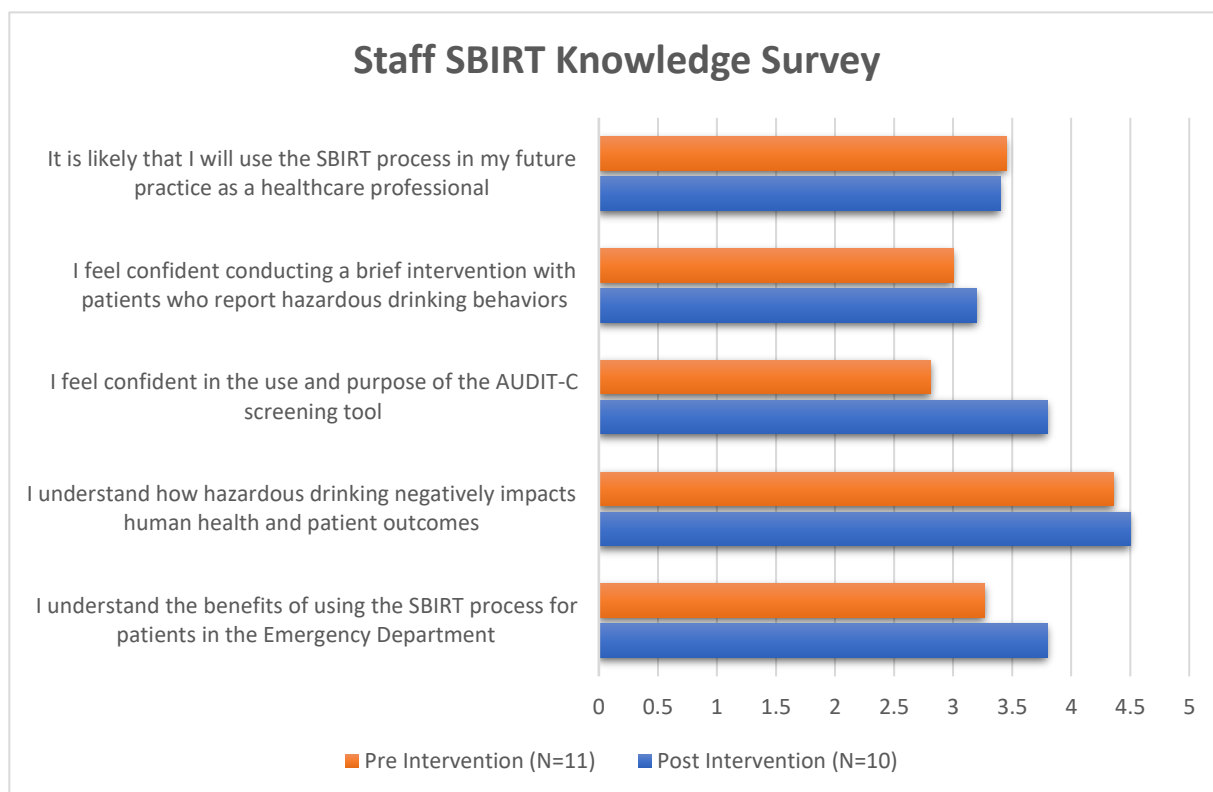
Soon after the staff meeting, educational materials including a Power-Point presentation on SBIRT and Motivational Interviewing, SBRIT process diagram, and copies of the AUDIT-C tool were sent out to all staff via email. Beginning on September first, AUDIT-C tools were made available in the triage room, a poster of the SBIRT process was put up in the nurse’s station, and a laminated motivational interviewing “quick reference” was made available to both provider and nurse’s stations.

## Measures and Outcomes

Two process measures were used to evaluate the SBIRT process: A pre and post education staff survey and a pre and post intervention chart review. The staff educational survey was a five question Likert scale survey asking nurses and providers to rank their confidence with their understanding of the SBIRT intervention’s relevance, use, and process. Surveys were given to nurses and providers in person during all three of the unit shifts over the course of several days. Eleven out of thirty-five staff completed surveys before the dissemination of educational materials. Ten out of thirty-four staff completed post intervention surveys. There was a twelve percent increase in Likert scale scores from pre intervention (average of 3.4) to post intervention (3.74) indicating an overall increase in understanding and confidence with the SBIRT process. The largest change in survey scores was in the question about confidence in use and purpose of the AUDIT-C screening tool. The question with the

overall highest score was one involving the understanding of alcohol related health outcomes. Table 1 shows the results from the staff survey with both pre and post intervention scores with five being the highest score possible.

Table 1 (Staff survey regarding AUDIT-C screening and SBIRT)

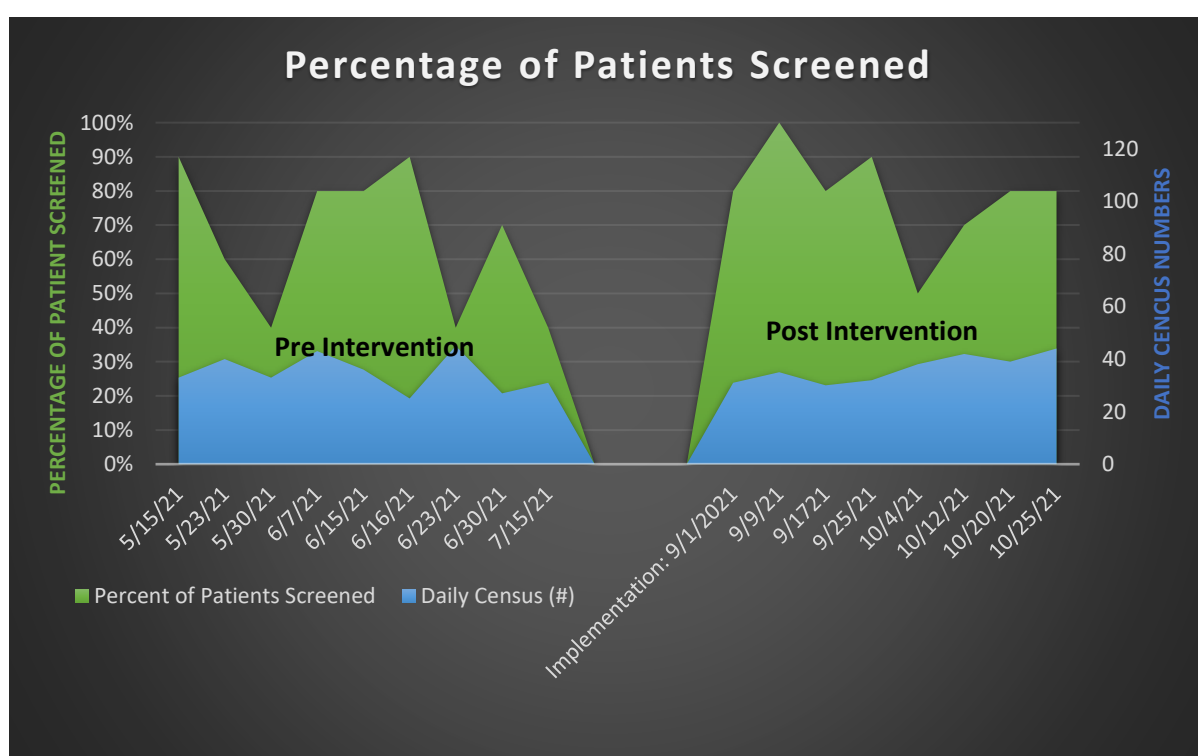


A retrospective chart review was conducted for eight weeks pre intervention and eight weeks after the intervention. A total of ten patient charts were reviewed per week for each eight-week period for a total of 160 patient charts. Twenty-four pre-intervention and ten post-intervention charts were discarded due to exclusion criteria. Alcohol screening rate was assessed by number of patients screened per ten charts reviewed (patients per week).

Post intervention chart review showed a relative increase of 1.4 screenings per ten encounters (Twenty-two percent) in the average number of patients screened for alcohol use. This increase of alcohol screening was limited to the use of the existing alcohol screening questions in the EHR and was not seen in use of the AUDIT-C tool. The AUDIT-C tool was made available during the implementation but was not widely used by nurses or

providers. Only one patient after project implementation was offered a Motivational Interview and referral to treatment. Because nurses used the older alcohol screening tool and not the AUDIT-C tool, there is no validated way to determine which patients met criteria for a brief intervention and referral to treatment. Without a way to determine which patients should have received an intervention from staff, it is impossible to measure the success of this aim. Table 2 shows the number of patients screened (patients screened per 10 encounters) in blue and the daily census in orange. Project implementation began on September 1<sup>st</sup>.

Table 2. (Percentage of Patients Screened for Alcohol Use)



### Context of Results

This project implementation coincided with the COVID-19 pandemic and the subsequent increase in Emergency Department census as well as pressures on staffing. The unit that this project was implemented in has been struggling to keep up with staffing demands while providing safe care to its patients. During the

implementation period one nurse retired and two left the department. Staffing needs have been met primarily by hiring travel nurses who were not familiar with the project or present for the SBIRT education. Year to date average daily census is increased by almost 5 patients per day from the year before. In a department that only has 10 beds, this swell in census has created additional challenges for staff.

The SBIRT intervention requires nurses and providers to perform an extra task and incorporate a new process into their practice. Given the context of the pressures on the department during this pandemic it is highly likely that project implementation was affected by these factors.

### Changes to Implementation

Originally, the SBIRT process in this department was going to be a process shared by all staff to reduce the impact on any one domain. Each step in the SBIRT intervention could be performed by different staff in the unit. Before project implementation the registration desk staff had agreed to provide AUDIT-C tools to all patients that arrived to register as a patient. This process step would have allowed the triage nurse to simply collect a completed AUDIT-C from every patient and add it into the EHR, making the overall workflow more efficient.

At implementation, the head of registration changed course by deciding that the reception workers were no longer able to provide patients with the screener tool. Due to a general feeling of being overworked and having many demands on their time related to the overall demands on the department, the registration desk workers were not going to be able to initiate the screening process. This change in workflow meant that the triage nurse would have to take on this step, adding a larger burden to that staff member.

### Summary

With the global aim of implementing an alcohol SBIRT process in the ED, the project team created a step-by-step guide for initiating an alcohol SBIRT system in a critical access Emergency Department. Nurses and



providers were consulted and surveyed before the initiation of the project on their knowledge and confidence in the SBIRT process. After this survey and staff meetings, educational material was disseminated out to all clinical staff in the department. In person coaching was done regarding the use of the AUDIT C tool and for clarifying the process. After eight weeks of implementation of the SBIRT process, patient charts were reviewed and compared with results from the eight weeks preceding the implementation. Clinical staff were also given the same survey to complete after the implementation to assess for increased knowledge and confidence in the SBIRT process.

Comparisons of both staff surveys and patient chart reviews show positive change from pre-intervention to post-intervention. This increase in both metrics suggests that the education and implementation did in fact improve the rate of alcohol screening in the department.

At the outset of the project, we aimed to screen at least sixty percent of all Emergency patients by 2022. Post intervention chart review shows that the department was able to screen 79 percent patients who met inclusion criteria. Brief intervention and referral to treatment (BIRT) was only offered to one patient in the post intervention chart review period.

### Interpretation

This project was implemented during a particularly unusual time for healthcare at both the local level and the global level. Pressures on staffing from shortages of nurses, increased patient census, and a global pandemic no doubt contributed in myriad ways to the outcomes of this project. The SBIRT process requires nurses and providers to invest time in both their own education and also in carrying out the intervention itself. This project placed a new task or burden on clinical staff and required them to consider one more facet of care delivery.

The twenty-two percent relative increase in patients screened for alcohol use was much greater than anticipated. The nurses' willingness to use the screening process on more patients was higher than anticipated at the outset of the project. Nurses however did not readily adopt the AUDIT-C screener tool and instead continued to use the one already embedded in the electronic chart. Regarding this metric, the nurses' willingness to use a new screener tool (the AUDIT-C) was lower than anticipated.

### Costs

The SBIRT process has intrinsic costs associated with its use primarily in the form time. The project manager spent approximately two-hundred hours on the background research, delivery of educational material, and implementation itself. This time does not include chart review or writing and organizing data. No member of the project team was paid for their time spent during its delivery however in a non-academic context this investment of time would require a financial imbursement.

### Limitations

This project was implemented in 2021, in a ten-bed critical access Emergency Department in a small college town in the Northeast. Any conclusions about the results should be considered within this context of place and time.

Chart review data was based on judgment sampling that aimed to get a representative sample of patient charts based on knowledge about hourly census and staffing. Judgment sampling allows the project manager with knowledge of the department to define sampling parameters that target a more representative sampling of people than truly random sampling would allow. In this case the parameters were constructed to ensure that all shifts throughout the twenty-four-hour day and by extension all the clinical staff were represented in the data. Although this method of sampling has advantages it is not random sampling and is therefore susceptible to bias.

Emergency Departments are notorious for labile census through shifts, days, and seasons. Changes in census can create time pressures on staff that have the potential to impact the fidelity of a project like this one. The possibility that unit census acted as a confounding variable is possible especially considering that the chart review began and ended in different seasons (May through October). Variables such as local tourism, the College student population, and weather are all potential confounders.

In an effort to limit the potential of patient census as a confounder, all chart review data has been graphed against daily census and average daily census. Although census does not necessarily have a causal relation to percentage of patients screened, it can offer context to the data in a visual format.

### Conclusions

One of the more challenging aspects to quality improvement interventions is staff buy-in. Staff buy-in determines whether an intervention ever actually reaches patients and changes practice. Without nurses and providers implementing the practice change, no intervention would ever manifest itself. The promising results of this quality improvement intervention show that it is possible to increase screening of patients for alcohol use in a critical access ED. Even during higher-than-normal census and during a pandemic, enough nurses bought-in to the educational materials on SBIRT and implemented the AUDIT-C tool. Because of this buy-in there was a market increase in the number of patients screened for alcohol use. These results are very promising in terms of what they imply for potential changes in practice.

### Sustainability

This intervention, including review of the literature, planning, and implementation required approximately three-hundred hours of work. The intervention in the ED itself cost extra time for all the nurses and providers involved. Although the SBIRT process is designed to be efficient in a fast-paced healthcare environment, it does require some amount of time and energy. At the close of this project the unit transitioned to a new Electronic Health Record that has the AUDIT-C tool embedded. This change will make the use of screening much easier for triage nurses and make it more likely for the SBIRT process to be utilized. Perhaps the most critical facet to sustainability is staff buy-in for the intervention. The nurses working in the project site ED had very high buy in for this intervention.

### Implications for practice and for further study in the field

Alcohol is directly or indirectly related to many of the Emergency Department visits each year in the United States. The literature has shown the efficacy of using the SBIRT process with ED patients and shown successful reductions in harmful drinking from even minimal interventions. Emergency Departments that implement universal screening for alcohol use not only see future reductions in actual alcohol consumed but also the costs associated with readmission. SBIRT for alcohol use has the potential to improve the outcomes of all patients who utilize the Emergency Department.

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## Appendix A

### Synthesis Table

Author, YEAR	Study Design Theoretical Framework	Sample Characteristics & Setting	Variables: Independent Dependent	Data Analysis	Main Findings	Level of Evidence**
Bacidore, Kameg, Mitchell, 2020	Review best clinical practice	ER setting -How to make SBIRT sustainable in the ER	SBIRT practices and their effect on sustainability of program	N/A	-Time efficient -EHR incorporation -Champion actors	Level 5
Bruguera, Barrio, 2021	RCT Follow up at 18 weeks and 1 year	ER setting alcohol use SBIRT Adults over 18	Independent: adults given leaflet on drinking.  Dependent: pt.'s given BIRT in ER	Multi-level regression analysis	-SBIRT has effect up to 1 year out compared to control.	Level 1
Bernstien 2007	Survey	ER providers	Comfort with SBIRT process and MI specifically		Short educational sessions dramatically increased provider comfort with MI techniques	Level 5
Cunningham et al. 2015	RCT	836 ER patients age 14-20 who screened positive for at risk drinking (AUDIT- C)	Independent= receiving BI in ER and post visit follow up. Dependent= AUDIT score, alcohol related injuries.	Regression analysis	Pts. who received BI from human or computer had reduced alcohol consumption and alcohol consequences 3-12 months out.	Level 1
Fernandez, et al., 2019	RCT	750 adult ER pts. Who previously reported recent risky drinking	Both computer BI and human BI Dependent= AUDIT-C score	latent growth curve modeling	All BI groups found reductions in AUDIT-C scores over 12 months post ER visit and young pts. Did well with Computer BI	Level 1

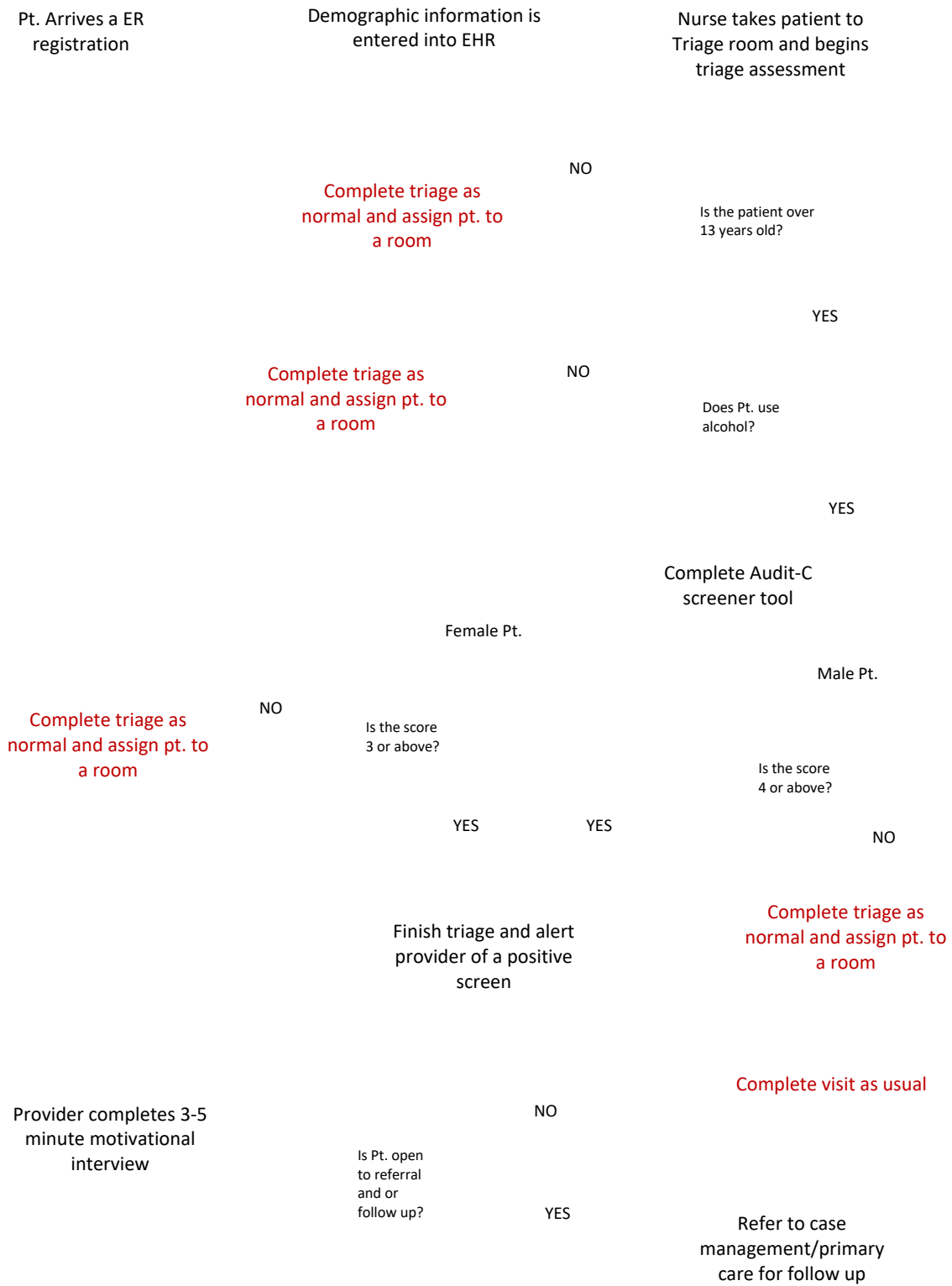


<b>Author, YEAR</b>	<b>Study Design Theoretical Framework</b>	<b>Sample Characteristics &amp; Setting</b>	<b>Variables: Independent Dependent</b>	<b>Data Analysis</b>	<b>Main Findings</b>	<b>Level of Evidence**</b>
Glann, et al. 2019	QI pre/post intervention data analysis	Adult patients admitted to hospital floor from ER in tertiary care VA hospital.	Intervention of AUDIT-C screen and CIWA-ar and length of stay.	Fisher's exact test descriptive statistics.	Use of CIWA-ar and AUDIT-C have implications for improving patient care by early identification of AUD	Level 4
Loon, Van der Mast 2017	Prospective cohort Secondary analysis	Adult (18+) ER patients (28,000) large inner city ER in the Netherlands	Which patients were not screened for various reasons and what is their risk profile for alcohol use?	Chi squared test, t-tests, and Mann-Whitney U tests	Patients who were not screened using AUDIT-C had more risk factors for dangerous drinking.	Level 2
Loon, Van der Mast 2017	Prospective cohort	Adult (18+) ER patients (28,000) large inner city ER in the Netherlands	Patients received BI and educational material Dependent= alcohol consumption	Chi Squared test	At 3 month follow up, in pt.s who received BI 35% either reduced or stopped drinking.	Level 2
Merchant, et al., 2017	RCT	833 adult ER patients	Screened with ASSIST tool and either received MI or not.	Summary statistics	Both MI group and no MI group had similar reductions in drinking behavior 3 months out. Reductions did not continue after 3 month. Ongoing follow up recommended.	Level 1
Pringle 2018	Observational	2546 Adult pts. in the ER in Allegany co. PA	Intervention hospital in 2012 vs. nonintervention	Multilevel regression	Overall healthcare costs were 21% lower and	Level 3

<b>Author, YEAR</b>	<b>Study Design Theoretical Framework</b>	<b>Sample Characteristics &amp; Setting</b>	<b>Variables: Independent Dependent</b>	<b>Data Analysis</b>	<b>Main Findings</b>	<b>Level of Evidence**</b>
			hospitals or same hospital in 2010		fewer ER visits for pt's who received SBIRT in ED	
Sommers 2013	RCT	ER patients 18-44 who screened positive for at risk drinking	Brief intervention group, no contact control group, and contact control group	T and chi square tests, mixed linear, general linear	Risky driving and drinking were reduced 9 months out with the intervention group.	Level 1

## Appendix B

### Work Flow Diagram



## Appendix C

**SBIRT in a Critical Access Emergency Department  
Timeline for Implementation**