DNP Projects   College of Nursing

2018

Provider Adherence and Influencing Factors to Implementation of an Alcohol Withdrawal Protocol

Ashley Sellers
amse239@uky.edu

Right click to open a feedback form in a new tab to let us know how this document benefits you.

Final DNP Project Report

Provider Adherence and Influencing Factors to
Implementation of an Alcohol Withdrawal Protocol

Ashley M. Sellers

University of Kentucky

College of Nursing

Fall 2018

Sheila Melander PhD, APRN, ACNP-BC, FCCM, FAANP, FAAN-- Committee Chair

Peggy El-Mallakh PhD., PMHNP-BC, RN - Committee Member

Rif S. El-Mallakh M.D.- Committee Member/Clinical Mentor

Dedication

This project is dedicated to my daughter Mia. Not only did I pursue this degree for myself but also so that I could be an example to her. My hope is for her to see what one is capable of with hard work and an education. Mia, always take advantage of opportunities offered to you and never believe you cannot achieve what is most important to you. This project is also dedicated to my parents who have always placed emphasis on the importance of learning and have been a constant pillar of love and support throughout my life.

Acknowledgements

Thank you to my advisor, Sheila Melander, who has helped bring me to the end of this journey with my sanity intact. Thank you to my committee members who have shared their expertise with me and given me guidance and encouragement. Thank you to my clinical preceptors who took time out of their demanding lives, imparted their vast experience and knowledge upon me, gave me challenging clinical experiences, and have contributed to my new skill set. Thank you to Dr. Amanda Wiggins and Whitney Kurtz-Ogilvie who helped me tie my project together and develop this manuscript. Thank you to my cohort classmates, especially my acute care companions who have lent me a hand along the way, provided emotional support, and cold margaritas. Thank you to Josh who tolerated a messy house, all the time I had to spend isolated in front of a computer screen, and coordinating our vacations around my school schedule; I love you. A special thank you to Norton Healthcare for providing me with this amazing opportunity. I have been employed with them for almost 17 years and I have never regretted it. Norton is a leader in the healthcare community and investing in their employees' education has always been a priority to the organization. Norton has been a part of my undergraduate and graduate nursing education and even helped me obtain national critical care certification. I am forever grateful for their continued support spanning nearly two decades.

Table of Contents

List of Tables

List of Figures

Abstract

PURPOSE: The purpose of this study was to assess provider adherence of an initial alcohol withdrawal protocol among adult inpatients, correlate outcome variables with protocol initiation, and examine the factors influencing provider decisions to implement all parts of the protocol.

METHODS: This multi-center descriptive evaluation utilized a retrospective medical record review and qualitative survey. A convenience sample of 313 inpatients represented 395 separate admissions between January and June 2018 in the four adult hospitals of a large health care system. Twenty-four providers participated in an anonymous online survey.

RESULTS: The protocol was implemented in its entirety three times (1%) out of 395 admissions during the study period. The survey revealed 37.5% of providers responded as *always* ordering the entire protocol and data analysis indicated labs and consults (41.2%) were the most commonly omitted components. No correlation existed between protocol initiation and mortality (p= .28) or hospital length of stay (p= .09). A statistically significant positive relationship existed between protocol implementation and intensive care unit transfers (p= <.001) and the dosage of benzodiazepines administered (p= .002).

CONCLUSION: Provider adherence for the entire initial alcohol withdrawal protocol was low among the adult hospitals. Despite the goal of standardizing care for inpatients with alcohol use disorders, adherence rates and outcomes varied at each hospital with discovery of unexpected correlations to protocol initiation. Further research is recommended to thoroughly examine outcome variables as they correlate to the protocol. An educational needs assessment is also recommended to develop more robust education for nursing staff and providers. Open communication and collaboration among providers will assist the system toward more cohesive practice.

Provider Adherence and Influencing Factors to

Implementation of an Alcohol Withdrawal Protocol

Introduction

The management of alcohol withdrawal (AW) is both clinically challenging and resource intensive for healthcare providers in the inpatient setting. The array of complex symptoms as well as increased risk for hospital complications and mortality require early identification of those at risk for AW and prompt implementation of evidence-based interventions that provide comprehensive care to the patient with an alcohol use disorder. An AW protocol that utilizes best practice interventions and embraces a multidisciplinary and holistic approach to hospitalized patients with alcohol use disorders may provide an opportunity to positively impact patients, hospital staff, and healthcare outcomes. Alcohol withdrawal protocols standardize care by reducing practice variation among providers. According to Johnson, Wilson, and DeBoisblanc (2014), AW protocols may reduce hospital costs and improve patient outcomes by assisting providers to deliver consistent, economical, and evidence-based interventions. This study was conducted to assess provider adherence for implementation of an AW protocol across a network of four adult hospitals within a healthcare system and to determine what factors, if any, influence those provider practices.

Background

The National Institute on Alcohol Abuse and Alcoholism [NIAAA] (2018) defines an alcohol use disorder (AUD) as a disease that involves compulsive and excessive intake of alcohol resulting in a state of withdrawal in the absence of the drug. It is estimated that around 16 million American adults currently have AUDs (NIAAA, 2018) and AUDs are prevalent in nearly 30-40% of all hospitalized medically ill patients (Maldonado et al., 2015). In 2010,

excessive alcohol intake cost the United States $249 billion, with healthcare and hospitalization amounting to $28 billion of that total (Sacks, Gonzales, Bouchery, Tomedi, & Brewer, 2015).

Hospitalized patients with AUDs are likely to experience withdrawal symptoms after the abrupt cessation of alcohol that occurs upon admission. According to Mirijello et al. (2015), up to 50 percent of patients with AUDs will develop withdrawal symptoms as early as six to 24 hours after admission. Withdrawal symptoms can lead to alcohol withdrawal syndrome (AWS) which encompasses a pattern of signs and symptoms including agitation, tremors, irritability, anxiety, confusion, tachycardia, hypertension, and seizures (Carlson et al., 2012). Without appropriate treatment, withdrawal symptoms can progress to delirium tremens, the most severe but preventable manifestation of AWS, which can cause death from respiratory or cardiovascular collapse (Phillips, Haycock, & Boyle, 2006).

Alcohol use disorders have been linked to increased healthcare costs, likelihood of infections, severity of medical complications, and mortality in the inpatient setting (de Wit, Jones, Sessler, Zilberberg & Weaver, 2010). Alcohol withdrawal syndrome can exacerbate comorbid conditions and contribute to longer, costlier, and more complicated hospital stays (Repper-DeLisi et al., 2008). Alcohol withdrawal syndrome increases the rate of nosocomial infections, sepsis, and mortality in critically ill patients and is also a significant strain on hospital personnel requirements, resources, and supplies (Duby, Berry, Ghayyem, Wilson, & Cocanour, 2014).

The main goals of inpatient AWS treatment focus on early identification of patients with AUDs, minimizing the severity of withdrawal symptoms, and preventing progression to the most severe symptoms of withdrawal such as seizure, delirium, and death. Prompt and aggressive treatment of patients with AUDs are essential to managing AWS. Otherwise, hospitalized

patients will experience poorer outcomes and will continue to be resource intensive while economically burdening healthcare across the nation.

Effectively managing hospitalized patients in AW has been the topic of countless research articles spanning several decades. As structuring treatment in the form of care bundles has become increasing popular in recent years, so has the utilization of protocols. Protocols provide evidence-based interventions ensuring a minimum standard of care based off recommended guidelines and have been successfully utilized in the critically ill for a variety of disorders such sepsis, ventilator associated pneumonia, and many others (Meade & Ely, 2002).

Protocols specific to AW have been recommended for their ability to simplify delivery of best practice interventions, promote comprehensive care, and reduce practice variation among providers (Barret et al., 2016; Johnson et al., 2014; Lansford et al., 2008). According to Ycaza-Gutierrez, Wilson, and Altman (2015), AW protocols provide a blueprint for care and have been shown to deliver consistent management of symptoms in the treatment of this difficult patient population. With consistent use of an AW protocol, at-risk patients may experience improved outcomes such as decreased intensive care unit transfers, reduced hospital length of stay, and decreased rates of infection. Thereby, resulting in lower healthcare-related costs.

A large health care system in the Louisville metropolitan area consisting of a network of five hospitals admitted more than 50,000 adult patients excluding labor and delivery and pediatric patients in 2017 (S. Deetsch, personal communication, January 17, 2018). In addition, the four adult hospitals within this health care system provided treatment to more than 2,000 inpatients with an alcohol-related diagnosis in 2017. This health care system currently offers an AW protocol for its providers to order on inpatients with AUDs. The initial protocol is a comprehensive order set including laboratory studies, consultations, medications, Clinical

Institute Withdrawal Assessment for Alcohol (CIWA) assessments, as well as general guidelines for monitoring vital signs and when to notify the provider concerning issues. The protocol requires a provider order for its initiation and all protocol components are to be implemented without addition of any other orders (See Appendix A).

Research by Young (2018), suggests that one of the four adult hospitals within this system, exhibited a high rate of adherence to alcohol use screening during the admission process of emergency department patients. However, only 4.7% of the 26.3% who screened positive for alcohol use were initiated on the AW protocol (Young, 2018). These findings may indicate insufficient identification of patients with AUDs at that hospital if compared to previous research reports that up to 40% of hospitalized patients have AUDs (de Wit et al., 2010; Maldonado et al., 2015; Mo et al., 2018). In addition, a low rate of initiation of the AW protocol among those patients indicate underutilization of the protocol.

This health care system employs hundreds of providers from different backgrounds and disciplines with varying years of experience who at some point are likely to encounter patients at risk for AW. The goal of the AW protocol is to provide uniform and evidenced-based treatment to patients with AUDs across the entire system. An assessment of provider adherence for initiation of the AW protocol among the system's adult hospitals along with an examination of the factors that influence providers in their decision to implement all, part, or none of the protocol components provides an opportunity to impact current practice and offer guidance for future education across the system. This critically important information will ultimately benefit the organization by addressing the disproportionate negative outcomes of this vulnerable patient population.

Purpose

Evidence-based AW protocols have been recommended by researchers for their ability to ensure best practice, standardize care, and improve patient outcomes in patients experiencing AW (Bahr & Smith, 2007; Johnson et al., 2014; Ycaza-Gutierrez et al., 2015). The purpose of this study was to assess provider adherence of one health care system's initial AW protocol among its adult hospitals and after determining if all protocol components were implemented, what factors influence a provider's decision when ordering the protocol in its entirety. The specific aims of this project were as follows:

1. Assess provider adherence for initiation of the initial AW protocol and determine if all, part, or none of the protocol components were ordered on patients identified as appropriate candidates.

2. Examine correlations among specific outcome variables with initiation of the AW protocol.

3. Examine the factors influencing provider practices related to implementation of the AW protocol.

Methods

This study was a multi-center, descriptive evaluation of provider adherence to a health care system's initial AW protocol and the factors influencing provider practices related to implementation of the protocol and all its components across its four adult hospitals. Outcome variables including hospital length of stay (LOS), intensive care unit (ICU) admissions and transfers, number of benzodiazepines (BZDs) administered in milligrams, and mortality were also obtained as measures for correlation to AW protocol initiation.

Setting

The health care system that provided the setting is a network of five hospitals in the

Louisville metropolitan area that includes one pediatric and four adult inpatient hospitals

servicing Jefferson County and many of the surrounding rural communities. Hospital A,

Hospital B, Hospital C, and Hospital D are the adult facilities with a total capacity of 1,537

inpatient beds. The health care system's adult hospitals provide inpatient, outpatient, and

surgical services to patients for a variety of medical reasons across all specialties. In addition,

the adult hospitals consist of numerous units in which three levels of care are available including

non-monitored medical surgical, progressive care, and intensive care. The mission of the health

care system is "to provide quality health care to all those we serve, in a manner that responds to

the needs of our communities and honors our faith heritage" (Norton Healthcare, n.d.).

Sample

A convenience sample of inpatients from the four adult hospitals provided the sample

population for the retrospective component of the study. Inpatient medical records were selected

and reviewed for inclusion and exclusion criteria for a goal of 100 medical records per facility.

Criteria for inclusion were all patients 18 years of age and older, admitted to any of the adult

hospitals from January to June 2018 for more than 24 hours with a documented history of AUD

or an alcohol use admission screening more than the NIAAA's definition of drinking at low risk

for developing AUD (NIAAA, 2018; see Figure 1). Patients with a history of AUD but

documented abstinence for more than six months were excluded from the study sample

population.

For the survey component of the study, the sample population included all providers

including medical doctors (MDs), doctors of osteopathy (DOs), advanced practice registered

nurses (APRNs), and physician assistants (PAs) in hospitalist, internist, or intensivist roles and who had privileges at any of the health care system's adult hospitals during the study period. Any providers who had not admitted patients during the study period were excluded from the sample population.

Data Collection

The first part of the study was conducted as a retrospective medical record review. Prior to collection of data, approval was obtained by the health care system's office of research and administration and the University of Kentucky Institutional Review Board. The health care system's research office compiled a list of medical records meeting inclusion criteria from the system's electronic database that was then given to the primary investigator.

During data collection, charts were accessed using medical record numbers from which data were extracted and recorded on a spreadsheet created by the primary investigator. Each medical record was assigned a unique study number that was de-identified to maintain confidentiality and necessary data for the study were then documented on the spreadsheet. The collected demographic variables included age, gender, and ethnicity while outcome variables included hospital LOS, level of care to which the patient was admitted, ICU transfers, mortality, and number of BZDs administered in milligrams. Benzodiazepines that were included in the analysis were lorazepam (Ativan), diazepam (Valium), midazolam (Versed), temazepam (Restoril), alprazolam (Xanax), and clonazepam (Klonopin). An attempt to avoid skewed data was the rationale for not including chlordiazepoxide (Librium) in this study since single dosages are considerably higher than other BZDs. Additional data obtained from the medical record included whether the AW protocol was initiated on appropriate inpatients, if all protocol components were ordered, and which protocol components were omitted.

The second part of the study utilized an electronic survey. With the assistance of the health care system's human resource analytics team, an email list was obtained of all providers meeting inclusion criteria. An email including a link to the electronic survey was then distributed to providers via Qualtrics. Providers were given two weeks to complete the anonymous survey, after which answers were tabulated, recorded, and analyzed. The survey consisted of nine questions, six of which were multiple-choice (see Appendix B). One of the multiple-choice questions provided a list of nine predetermined influencing factors developed by the primary investigator. Respondents were asked to choose up to five factors from the list if applicable to their prescribing practices for protocol implementation. The remaining three questions on the survey were open-ended.

Data Analysis

Statistical analysis was completed using SPSS version 24 and an alpha level of .05 was used to evaluate for statistical significance. Descriptive statistics including frequency distributions, means, medians, standard deviations (SD), interquartile ranges (IQR), and percentages were used to describe demographic characteristics of the sample populations and variable outcomes. Medians and IQRs were specifically used to describe hospital LOS and dosage of BZDs due to the presence of extreme outliers creating an abnormal distribution of the data. Mann-Whitney U and Chi square tests of association were used to determine if there were any statistically significant relationships existing between implementation of the AW protocol and outcome variables.

Survey responses were also analyzed using descriptive statistics. Chi square test of association was used to determine if any statistically significant relationships existed between survey respondents and patterns in initiation of the AW protocol. Narratives from the open-

ended questions of the survey were analyzed by reviewing answers for identification of common themes.

Results

Population Demographics

For the retrospective part of the study, medical records from all four of the adult hospitals were reviewed for patients meeting inclusion criteria. Occasionally, there were patients who met study criteria and were admitted more than once during the study period. Therefore, each admission was evaluated and included as a separate occurrence. In total, 313 medical records representing 395 separate admissions met criteria for inclusion in the study.

The mean age of the total sample was 52.8 years (SD=13.5) with a mean of 54.1 years (SD=13.1) at Hospital A, 56.9 years (SD=14.0) at Hospital B, 53.4 years (SD=11.1) at Hospital C, and 46.5 years (SD=13.7) at Hospital D. Most of the total sample was male (73.8%) as well as each of the respective hospitals (87.8%, 71.8%, 71.3%, and 63.0%; see Table 1). Caucasian patients represented the largest ethnic group of the total sample (81.1%) followed by African Americans (15.7%), Hispanics (1.3%), Asian Indians (0.3%), Other (1.3%), and Pacific Islanders (0.3%).

For the survey part of the study, an email with a survey link was sent to specific providers across the system. The health care system employees many of the providers who were invited to participate while other providers are contract employees but belong to private practices. A total of 99 providers were invited to participate in the survey and 24 providers responded, representing 24.2% of the eligible population.

Survey participants were mostly physicians (54.2%), while APRNs comprised 37.5% of respondents, and PAs comprised only 8.3% of the total sample of respondents (see Table 2).

Most respondents had two to 10 years of experience in their reported clinical role (45.8%), while 41.7% had greater than 10 years of experience, and 12.5% had less than two years of experience.

Sample Characteristics

The median hospital LOS for the total sample population was 4 days (IQR= 3-7), with Hospital D having the shortest median LOS of 3 days (IQR=2-5), and Hospital C having the longest median LOS of 6 days (IQR= 4-13; see Table 3). Admissions to the ICU represented 28.1% of the total sample; Hospital C had the highest rate of ICU admissions at 35.4% and Hospital A had the lowest rate of ICU admissions at 13.1%. Transfers to the ICU were required in 9.9% of the total sample; Hospital C had the highest ICU transfer rate of 18.2% and Hospital A had the lowest ICU transfer rate of 5.1%. Mortality rates of the total sample were 3.0%; Hospital B had the highest rate of 5.1% while Hospital C and Hospital D had the lowest rate of 2.0%. The median dosage of BZDs administered in milligrams among the total sample who received them was 17mgs (IQR= 5-41) with Hospital C administering the highest median dosage of 26.5mgs (IQR= 9.8-57.4) and Hospital A administering the lowest median dosage of 7mgs (IQR= 2-22.3). Hospital B administered a median dosage of 12mgs (4-37) and Hospital D administered a median dosage of 20.5mgs (7.5-40).

Alcohol Withdrawal Protocol Adherence

Adherence rates for initiating the AW protocol were 64.6% for the total sample, Hospital A was 44.4%, Hospital B was 50%, Hospital C was 80.8%, and Hospital D was 82.8% (see Table 3). The overall rate for implementation of the AW protocol in its entirety was 1% with only three occurrences out of 395 admissions. Hospital C had the highest rate of total protocol implementation at 3% with all other hospitals at 0%. Rates for partial implementation of the AW protocol were 77% for the total sample, Hospital A 65%, Hospital B 65%, Hospital C 83%, and

Hospital D 94% (see Figure 3). The most commonly omitted components of the AW protocol, among those with protocol initiation, were labs and consultations (41.2%), labs (36.5%), labs, meds, and consultations (10.6%), labs and meds (6.3%), consultations (2%), and meds and consultations (1.6%; see Table 4).

All 24 survey respondents indicated that they were familiar with the health care system's comprehensive standing order set for AW. Responses from survey participants for frequency of admissions of patients with AUD were 16.7% for *rarely* (less than two per month), 29.2% for *sometimes* (two to five times per month), and 54.2% for *frequently* (greater than five times per month; see Table 2). Respondent reports for frequency of ordering the entire AW protocol varied, with 37.5% indicating *always*, 58.3% indicating *sometimes*, and 4.2% indicating that they *created or added to the protocol*.

Correlations to Outcome Variables

Specific outcome variables were compared to whether the AW protocol was initiated or not. There was no statistically significant correlation between AW protocol initiation and hospital LOS (p=.09) or mortality (p=.28; see Table 5). However, a statistically significant positive correlation existed between protocol initiation and BZD administration (p=<.001) and ICU transfers (p=.002). When the AW protocol was initiated, the median dosage of BZDs increased from 5mgs (2-19) to 21.5mgs (8.6-50.5). The number of ICU transfers increased from five (3.6%) to 34 (13.3%) with protocol initiation.

Survey Response Findings and Themes

The most common factors, chosen by survey participants, from the predetermined list that influenced their decision to implement the AW protocol was patients' reports of current abstinence from alcohol (21.3%) and not being aware of the patients' AUD at the time of

admission (21.3%). Subsequent influencing factors from the survey included that providers did

not think the patient drank enough to go into withdrawal (17.0%), and they felt withdrawal

would not be an issue during the patient's admission (14.9%; see Table 6). A correlation between

protocol component implementation and type of provider or years of experience was examined

for statistical significance. Analysis indicated there was no statistically significant relationship

between the type of provider (p=.11; see Figure 3) or years of experience (p=.77; see Figure 4)

when correlated to protocol component implementation.

Four major themes emerged from review of the open-ended responses by survey

participants. The first theme was the psychiatry consultation was unnecessary and therefore was

frequently omitted from the order set. The second theme was a suggestion to include additional

adjuncts to the existing medications in the AW protocol. The third theme was a recommendation

for improved education of the nursing staff specific to the delivery of the AW protocol. The

fourth theme gathered from survey responses was a need for earlier detection of patients with

AUDs.

Discussion

Despite the availability of a comprehensive order set intended for standardization of care

among patients who are identified with AUDs, this study revealed considerable variability in

provider practices at the different adult hospitals across the health care system. None of the adult

hospitals initiated the AW protocol on 100% of appropriate patients identified in this study and

initiation rates varied from as low as 44% at Hospital A up to 83% at Hospital D.

The top four factors survey respondents gave as influencing their decision for protocol

implementation involved either not knowing the patient had an AUD or underestimating the

severity of the AUD. These factors represent reasonable explanations, although subjective, for

not implementing the AW protocol. However, the initial AW protocol focuses mainly on supportive care including CIWA assessments, consultations, laboratory studies, and mineral replacement medications. Benzodiazepines are not included in the initial AW protocol but can be implemented separately once CIWA scores are high enough. Therefore, the components of the initial AW protocol provide little to no potential harm to a patient when implemented. When considering this topic, an important issue must be addressed: the initial AW protocol is not consistently ordered for patients with a provisional or questionable diagnosis of AUD, even though the protocol poses very little harm to the patient.

Variations Across Hospitals

Not only did provider implementation practices differ across the health care system's adult hospitals, but outcome variables did as well. Hospital C was the only facility that exhibited total compliance with implementation of the entire AW protocol and all its components, albeit totaling only three occurrences. Hospital C also had the second highest rate of AW protocol initiation and lowest mortality rates. Yet, Hospital C admitted and transferred more patients to the ICU, administered the highest median dosage of BZDs and had the longest hospital LOS. The median LOS at Hospital C was twice as long as Hospital D which had the highest rate of AW protocol initiation. Although these findings could be considered undesirable if simply examining the statistics, consideration should be given as this may also reflect the underlying severity of illness represented at Hospital C.

Hospital A had the lowest rate of AW protocol initiation and shared the lowest rate of partial protocol component implementation with Hospital B. However, Hospital A administered the lowest median dosage of BZDs, admitted and transferred the fewest patients to the ICU, and had the second shortest hospital LOS with little increase in their mortality rate. The highest rate

of AW protocol initiation and partial implementation of the AW protocol components occurred at Hospital D which also had the shortest hospital LOS. These findings are positive indicators for use of the AW protocol. However, these findings may also be attributed to the fact that, compared with the rest of the hospitals, Hospital D admitted younger patients with AUDs who may not have the accompanying comorbidities of aging that can complicate hospital stays.

With each of the hospitals performing differently for several of the outcome variables, it may be reasonable to assume that providers from each of the system's different adult hospitals have observations worth sharing that could benefit the entire organization. A multi-hospital practice change initiative could offer the possibility to improve outcomes and consistency if providers across the health care system's adult hospitals participate in a system-wide forum that shares pertinent insight and experience. This collaboration between providers could offer an opportunity for more cohesive treatment of the inpatient population with AUDs found within the system.

Qualitative Survey Themes

The major themes identified from the narratives of the survey's open-ended questions propose areas for improvement of the AW protocol as suggested by respondents. The most common influencing factor revealed by providers from their open responses in the survey was the disagreement that all patients initiated on the AW protocol needed a psychiatry consultation. Lack of underlying psychological issues, dependent upon patient request, and the feeling that a psychiatry consultation was not necessary for all patients with AUDs in withdrawal were all included in participant survey responses as to why the consultation would frequently be omitted. A consultation to psychiatry is an intervention included on the AW protocol in an attempt to help patients with AUDs treat their disease. However, since this consultation was frequently left out

of the standing orders for AW, this omission could be a consideration for future modifications to the protocol.

A suggestion to add to the existing medications in the AW protocol was another theme identified during survey analysis. Several respondents recommended adding chlordiazepoxide (Librium) to the AW protocol while gabapentin (Neurontin) and dexmedetomidine (Precedex) were also mentioned, but by single respondents. More research into each of these medications as adjuncts may prove helpful, especially if providers already consistently add them to the order set. At this time, clonidine (Catapres) is the only adjunct included on the initial AW protocol.

Improved education of the nursing staff when executing the AW protocol was also identified as a theme from survey narratives. One respondent expressed concern over the subjectivity of the CIWA assessments performed by nursing and variability in scores from one shift to the next compared to the provider's assessment during rounds. Another respondent mentioned the opinion that floor nurses undertreated patients on the AW protocol. These responses from survey respondents may indicate a lack in knowledge of AW and its proper treatment among the nursing staff. Assessing current knowledge of AUDs and delivery of the AW protocol among nursing staff along with proper dissemination of current best practice interventions may represent the first step in improving the education of nurses carrying out the AW protocol. Continued education is especially important given the AW protocol is nurse-driven.

The final theme gathered from survey responses was the need for earlier detection of patients with AUDs. Currently, the health care system's adult hospitals do not use any validated screening tools during the admission alcohol use screening process performed by nursing staff. An alcohol use history is obtained upon hospitalization that only asks if a patient consumes

alcohol and how much. According to Hecksel, Bostwick, Jaegar, and Cha (2008), only 20-50%

of patients with abuse or dependence are detected when asked about the quantity and frequency

of alcohol intake due to the insensitivity of the questions. Implementation of validated screening

tools such as the CAGE (Cut Down, Annoyed, Guilty, Eye Opener) or the AUDIT (Alcohol Use

Disorders Identification Test) during the admission process may help identify more patients with

AUDs even earlier which could lead to quicker initiation of the AW protocol. Prompt initiation

of the AW protocol aligns with the goals of treatment for minimizing the severity of withdrawal

symptoms and preventing progression to the most severe symptoms of withdrawal.

Outcome Variable Improvement

This study has revealed areas for improvement of patient outcomes and provider

adherence across the health care system as they relate to the AW protocol. The lack of a

correlation between the initiation of the AW protocol and hospital LOS and mortality as well as

the positive relationship between the protocol and BZDs doses and ICU transfers support this

assertion. The increase in BZDs administered with protocol initiation may represent effective

management of AWS and the abatement of symptoms. However, an increase in transfers to the

ICU with protocol initiation is not necessarily a desired result of the protocol. Patients with

AUDs can be particularly vulnerable in the ICU with higher morbidity and mortality than those

patients who are not diagnosed with AUDs (Monte et al., 2010). There is also up to a 49%

increased risk for mechanical ventilation and prolonged duration of mechanical ventilation for

patients in the ICU who have AUDs (de Wit, Best, Gennings, Burnham, & Moss, 2007).

The mortality rate for the system was 3% with Hospital B exhibiting the highest rate of

5.1%. According to Monte et al. (2010), mortality rates of AWS have decreased to a range of 1-

2.4 % as a result of recent improvements in treatment. The total sample mortality rate was close

to this range, but the mortality rate at Hospital B was much higher indicating an area for improvement. Hospital B treated the oldest patients from the sample population and is also a comprehensive stroke center which may have contributed to the increased number of deaths as heavy alcohol consumption has been identified as a risk factor for stroke (Reynolds et al., 2003).

Limitations

The number of completed provider survey responses represented a limitation of this study. Only about 24% of the providers who were invited to participate in the survey responded. Without more comprehensive feedback from ordering providers, there will be less insight into their prescribing practices which greatly impacts this vulnerable patient population. The desire to better understand these influencing factors was foundational to this research study. Although some revelations were discovered, there still may be much to learn.

Another limitation of this study was the inclusion and exclusion criteria used for the patient's drinking status. All patients with a documented history of AUD or an alcohol use admission screening more than the NIAAA's definition of drinking at low risk for developing AUD were selected for the study. Those patients with a documented history of abstinence for more than six months were excluded. These criteria may have cast a wide net which may have included patients who were not currently at risk for AW. However, for this study, inclusion and exclusion criteria were specifically chosen with the understanding that patients with AUDs often provide inaccurate information about their drinking patterns or underreport their actual alcohol consumption (Roche, Freeman, & Skinner, 2006).

The short study period of only six months and relatively small sample size also pose limitations to the data within this research as the time frame and sample may not represent an accurate picture of true outcome variables at each of the hospitals. Examining outcome variables

and provider adherence for a minimum of a year may increase the generalizability and reliability of research findings. In addition, this study only captured inpatients for half of a year. Perhaps a yearlong study would provide a more comprehensive representation of patients with AUDs of which to investigate outcomes more thoroughly.

Subjectivity also represents a limitation of this study. Provider subjectivity affects identification of patients with AUDs and which patients are initiated on the AW protocol. Nursing subjectivity affects the CIWA assessments which can impact decisions on what level of care to admit patients with AUDs and when to initiate BZD administration. Subjectivity is commonly intertwined with AW and may have limited the reliability of this study's results.

Recommendations for Future Research

This study revealed surprising correlations to outcome variables, therefore, a more in-depth examination of the health care system's initial AW protocol and its impact on additional patient outcomes is recommended. Future research may need to extend over a longer study period, include more patients from each of the adult hospitals, and evaluate additional variables such as CIWA scores, AWS duration, and referrals made to rehabilitation facilities. Examining patient medical records who were discharged with a diagnosis of alcohol withdrawal versus those admitted with an AUD diagnosis may also help capture a more representative population.

Since there were several records with multiple admissions in this sample, an investigation into commonalities of these patients and ways of preventing recurrent admissions could be advantageous to the health care system in a number of ways. A cost benefit analysis comparing initiation of the AW protocol on patients with suspicion of AUD may also prove worthwhile. This analysis could provide evidence of whether initiating the AW protocol yields savings for hospital stays despite the cost of the initial laboratory studies, medications, and consultations.

A needs assessment regarding the basic knowledge of nursing staff and providers regarding AW is also recommended. According to Berge and Morse (2008), an adequate number of specialists in substance abuse or chemical dependency are missing in the hospital environment which can result in problematic evaluation and treatment of AW by providers who are otherwise not experts. Therefore, an educational needs assessment may help create more robust programs fitting the specific needs of the health care system's audience while also equipping providers with the appropriate tools for success. Detailed education of current research findings may help the system's providers and nursing staff address subjectivity of CIWA assessments, improve early identification of at-risk patient, and assist in proper and timely implementation of best practice interventions.

Conclusion

The goal of this study was to assess provider adherence rates to implementation of an AW protocol utilized within a health care network of four adult hospitals and then to examine what factors influence providers' decision when ordering all the components of the protocol. Although desired goals of an AW protocol include standardizing treatment and simplifying care to the alcoholic inpatient population, adherence rates were low and inconsistent provider prescribing practices existed among the health care system's adult hospitals creating variations in outcomes. Further exploration of the AW protocol as it relates to patient outcomes along with assessment of educational needs for nursing staff and providers is recommended.

This study highlighted areas for improvement in the treatment of inpatients with alcohol use disorders. Although the findings from this study could be misinterpreted as exposing faults in providers' prescribing practices, the intent of this research was to bring awareness of current practices within the health care system's adult hospitals and contribute to future protocol

modifications. Berge and Morse (2008) propose, "the ability of a protocol to treat a medical condition is no better than the quality of the treatment protocol, the strength of the diagnosis, and the application of the protocol to the treatment of appropriate patients" (p.271). With this statement in mind, the findings presented in this study ultimately strive for a goal of bringing the system's adult hospitals toward more cohesive practices and improving outcomes of this vulnerable population.

Appendix A

Initial Alcohol Withdrawal Protocol

Initial Alcohol Withdrawl Protocol [3040010116]

There is an option to order a scheduled dose of ativan on this set for CIWA scores of 8 or more.
This needs to be selected if it is to be ordered otherwise it will not be given. Please contact the MD to
determine if he wants the patient to receive the scheduled dosing.

Nursing please do the initial CIWA assessment and document the score before activating this protocol.
The correct medication order will be available to select based on the CIWA score documented.

NOTE: A physician order is required to initiate the protocol and all orders are to be initiated. Do not add
additional orders as part of this protocol set.

General

Initiate Protocol

☑ Initiate Alcohol Withdrawal Protocol	Routine, Once
☑ Initiate the CIWA Reassessment Mediication Order Set from the Alcohol Withdrawal Protocol per following criteria:	Routine, Per Protocol Orders - Each time the CIWA assessment score changes the patient to a different risk level from the previous CIWA assessment score initiate the "CIWA reassessment medication order set" so pharmacy may update the MAR.

Vital Signs

☑ Vital signs with the CIWA assessments	Routine, Per Protocol Orders With CIWA assessment. Frequency based on CIWA scores: - CIWA score is less than 8, reassess every 8 hours. - CIWA score 8 to 15, reassess every 4 hours. - CIWA score Greater than 15, reassess every 2 hours while awake.

Notify Physician

☑ Notify physician for breakthrough symptoms of withdrawal including:	Routine, As needed - Anxiety; Agitation; Severe Vomiting; Seizures
☑ Notify MD of vital signs	Routine, As needed Temperature greater than: Pulse less than: Pulse greater than: Respiratory rate less than: Respiratory rate greater than: Systolic BP less than: 90 Systolic BP greater than: 160 Diastolic BP less than: Diastolic BP greater than: 100 MAP less than: Urine output, mLs over 4 hrs, less than: Urine output, mLs per hr, less than: Other comment:
☑ Notify physician for possible transfer order to ICU if CIWA score is greater than 15	Routine, As needed

Nursing Orders

☑ Clinical institute withdrawal assessment	Routine, Per Protocol Orders For Until specified Assess CIWA Scale and Obtain Vital Signs: - If CIWA Score is less than 8, reassess every 8 hours - If CIWA score is 8 to 15, reassess every 4 hours - If CIWA score is Greater than 15, reassess every 2 hours while awake - If CIWA assesment is discontinued and symptoms reappear then resume the CIWA assessment frequency based on scores. NOTE: If the reassessment score changes the patient to a different risk level from the previous score be sure to initiate the CIWA Reassessment Medication Orders: Alcohol Withdrawal Protocol so the correct meds will be placed on the MAR.
☑ Discontinue CIWA assessments per following criteria:	Routine, As needed - If CIWA scores are less than 8 for 24H. - Restart scoring and protocol if any symptoms reappear.

Laboratory

STAT Labs

☑ Comprehensive Metabolic Panel(CMP)	STAT, Once For 1 Occurrences If not already done in the last 12 hours. Cancel if not needed.
☑ CBC w/Diff	STAT, Once For 1 Occurrences If not already done in the last 12 hours. Cancel if not needed.
☑ Magnesium	STAT, Once For 1 Occurrences If not already done in the last 12 hours. Cancel if not needed.
☑ Phosphorus	STAT, Once For 1 Occurrences If not already done in the last 12 hours. Cancel if not needed.
☑ Hepatic Function Panel	STAT, Once For 1 Occurrences If not already done in the last 12 hours. Cancel if not needed.
☑ Ethanol	STAT, Once For 1 Occurrences Blood alcohol content- If not already done in the last 12 hours. Cancel if not needed.
☑ Toxicology Screen, urine	STAT, Once For 1 Occurrences If not already done in the last 12 hours. Cancel if not needed. Include Methadone? No Include Tricyclics? No

Consults

Physician Consults

☑ Inpatient consult to Psychiatry	Reason for Consult? alcohol withdrawl protocol

Ancillary Consults

☑ Inpatient consult to Social Services	Reason for Consult? Alcohol/Chemical abuse
☑ Inpatient consult to Dietician	Reason for Consult? Other (comment) - per alcohol withdrawal protocol

Medications

Medications

☑ Thiamine IM or Oral	**"Or" Linked Panel**

☑ thiamine (B-1) injection	100 mg, Intramuscular, Once, Once Starting today For 1 Doses, For 1 Doses Give NOW Use IM Dose Form First, If Unable to Take IM Then Give Oral Dosage Form. Timed
☑ vitamin B-1 tablet	100 mg, Oral, Once, Once Starting today For 1 Doses, For 1 Doses Give NOW Use IM Dose Form First, If Unable to Take IM Then Give Oral Dosage Form. Timed
☑ vitamin B-1 tablet	100 mg, Oral, Daily, Daily Starting tomorrow, Routine
☑ vitamins/minerals	1 tablet, Oral, Daily, Daily, Routine
☑ folic acid (FOLVITE) tablet	1 mg, Oral, Daily, Daily, Routine
☑ dextrose 5 % with thiamine 100 mg, M.V.I. Adult 10 mL, folic acid 1 mg infusion	at 125 mL/hr, Intravenous, Daily as needed, Other, Hydration/supplementation- only give if patient is unable to take oral thiamine, multiple vitamin and folic acid, Daily as needed
☑ cloNIDine (CATAPRES) tablet	0.1 mg, Oral, PRN, Other, Every 1-6 hours as needed for Systolic Blood Pressure Greater Than 160 or Diastolic Blood Pressure Greater Than 100, PRN Maximum Dose is 0.6 mg in 24 Hours. Routine

CIWA Score Not Documented When Protocol Initiated

☑ This order shows when the CIWA score has not been documented at the time the Initial Alcohol Withdrawal Protocol is initiated. Nursing needs to do the following:	STAT, Once For 1 Occurrences When there is no CIWA score documented the Ativan orders will not be displayed for the MD to order as he will not know the CIWA score to make an informed decision regarding the Ativan. Therefore nursing should: - Assess the patient and document the CIWA score stat - Enter the CIWA Reassessment Med Orders for Alcohol Withdrawal order set as soon as CIWA score is documented. NOTE: If the CIWA score is greater than 8, nursing will need to contact the MD as to whether to include a scheduled Ativan order per reassessment order set. (See CIWA Reassessment order set for details)

Appendix B

Survey Distributed to Providers

Q1. How often do you admit patients with alcohol abuse?

◯ Rarely (<2 per month)

◯ Sometimes (3-5 per month)

◯ Frequently (>5 per month)

Q2. Are you familiar with the comprehensive standing order set for alcohol withdrawal (CIWA protocol)?

☐ Yes

☐ No

Q3. When ordering the alcohol withdrawal protocol, how often do you implement the entire order set versus selecting only the specific orders you want?

◯ I always select the entire order set

◯ Sometimes I select specific orders from the protocol

◯ I create my own orders/add my own orders to the existing protocol

Q4. What are the most common factors that influence your decision to either implement or not implement the alcohol withdrawal order set in its entirety? (Select up to 5)
_____ The patient states they have abstained from drinking
_____ I feel like withdrawal will not be an issue during the patient's admission
_____ Concern for over sedation
_____ I do not think the patient drinks enough to go into withdrawal
_____ I was not aware my patient had an alcohol use disorder at the time of admission
_____ I do not approve of the dosing of the benzodiazepines in the protocol
_____ I am unfamiliar with the protocol components
_____ I prefer to treat at my own discretion
_____ Medically contraindicated

Q5. Are there any other factors (not listed above) that influence your decision when ordering/not ordering the protocol in its entirety or altering the current protocol?

_____

Q6. In your professional opinion, what would be most helpful for this patient population for standardizing and optimizing patient standards of care?

_____

Q7. In your professional opinion, what should be considered and added as a standard of care with this patient population?

_____

Q8. What is your professional role?

    ○ MD or DO

    ○ APRN

    ○ PA

Q9. How many years of experience (in the above role) do you have as a direct inpatient provider?

    ○ <2 years

    ○ 2-10 years

    ○ >10 years

References

Bahr S, & Smith J. (2007). Improving patient outcomes utilizing an evidence-based alcohol

    withdrawal protocol...2007 NACNS National Conference abstracts: February 28-March

    3, 2007, Phoenix, Arizona. *Clinical Nurse Specialist: The Journal for Advanced Nursing*

    Practice, *21*(2), 102.

Barret, J., Jansen, M., Cooper, A., Felbinger, M., & Waters, F. (2016). Embracing a nurse-

    driven alcohol withdrawal protocol through quality improvement. *Journal of Addictions*

    Nursing, 27(4), E1-E2.

Berge, K.H. & Morse, R.M. (2008). Protocol-driven treatment of alcohol withdrawal in a general

    hospital: When theory meets practice. *Mayo Clinic Proceedings, 83*(3), 270-271.

Carlson, R.W., Kumar, N.N., Wong-Mckinstry, E., Ayyagari, S., Puri, N., Jackson, F.K., &

    Shashikumar, S. (2012). Alcohol withdrawal syndrome. *Critical Care Clinics, 28*(4),

    549-585. http://dx.doi.org/10.1016/j.ccc.2012.07.004

de Wit, M., Best, A., Gennings, C., Burnham, E.L., & Moss, M. (2007). Alcohol use disorders

    increase the risk for mechanical ventilation in medical patients. *Alcoholism: Clinical and*

    Experimental Research, 31(7), 1224-1230.

    https://doi-org.ezproxy.uky.edu/10.1111/j.1530-0277.2007.00421.x

de Wit M., Jones D.G., Sessler, C.N., Zilberberg, M.D., & Weaver, M.F. (2010). Alcohol-use

    disorders in the critically ill patient. *CHEST*, *138*(4), 994–1003.

    https://doi.org/10.1378/chest.09-1425

 Duby, J.J., Berry, A.J., Ghayyem, P., Wilson, M.D., & Cocanour, C.S. (2014). Alcohol

    withdrawal syndrome in critically ill patients: Protocolized versus nonprotocolized

management. *Journal of Trauma & Acute Care Surgery*, *77*(6), 938–943.
https://doi.org/10.1097/TA.0000000000000352

Hecksel, K.A., Bostwick, J.M., Jaeger, T.M., & Cha, S.S. (2008). Inappropriate use of symptom-triggered therapy for alcohol withdrawal in the general hospital. *Mayo Clinic Proceedings,83*(3), 274-279.

Johnson, J., Wilson, D., & DeBoisblanc, B. (2014). Missed opportunities for intervention in the comprehensive management of alcohol withdrawal syndrome. *Critical Care Medicine,(42)*12, Supplement 1: A1558.
https:// doi: 10.1097/01.ccm.0000458319.97923.06

Lansford, C.D., Guerriero, C.H., Kocan, M.J., Turley, R., Groves, M.W., Bahl, V., . . . Teknos, T.N. (2008). Improved outcomes in patients with head and neck cancer using a standardized care protocol for postoperative alcohol withdrawal. *Archives of Otolaryngology–Head & Neck Surgery, 134*(8), 865-872.

Maldonado, J., Sher, Y., Das, S., Hills-Evans, K., Frenklach, A., Lolak, S., . . . Neri, E. (2015). Prospective validation study of the prediction of alcohol withdrawal severity scale (PAWSS) in medically ill inpatients: A new scale for the prediction of complicated alcohol withdrawal syndrome. *Alcohol and Alcoholism, 50*(5), 509-518.
https:// doi:10.1093/alcalc/agv043

Meade, M., & Ely, E. (2002). Protocols to improve the care of critically ill pediatric and adult patients. *JAMA, 288*(20), 2601-2603. https://doi:10.1001/jama.288.20.2601

Mirijello, A., D'Angelo, C., Ferrulli, A., Vassallo, G., Antonelli, M., Caputo, F., … Addolorato, G. (2015). Identification and management of alcohol withdrawal syndrome. *Drugs*, *75*(4), 353–365. https://doi-org.ezproxy.uky.edu/10.1007/s40265-015-0358-1

Mo, Y., Thomas, M. C., Laskey, C. S., Shcherbakova, N., Bankert, M. L., & Halloran, R. H. (2018). Current practice patterns in the management of alcohol withdrawal syndrome. *Pharmacy and Therapeutics*, *43*(3), 158–162.

Monte, R., Rabunal, R., Casariego, E., Lopez-Agreda, H., Mateos, A., & Pertega, S. (2010). Analysis of the factors determining survival of alcoholic withdrawal syndrome patients in a general hospital. *Alcohol and Alcoholism, 45*(2), 151-158. https://doi.org/10.1093/alcalc/agp087

National Institute on Alcohol Abuse and Alcoholism [NIAAA]. (2018). *Alcohol facts and statistics.* [Fact sheet]. Retrieved from https://pubs.niaaa.nih.gov/publications/AlcoholFacts&Stats/AlcoholFacts&Stats.htm

Norton Healthcare. (n.d.). Mission vision & values. Retrieved October 23, 2018 from https://nortonhealthcare.com/Pages/missionvisionvalues.aspx

Phillips, S., Haycock, C., & Boyle, D. (2006). Development of an alcohol withdrawal protocol-CNS collaborative exemplar. *Clinical Nurse Specialist, 20*(4), 190-200.

Repper-DeLisi, J., Stern, T.A., Mitchell, M., Lussier-Cushing, M., Lakatos, B., Fricchione, G.L., ... Bierer, M. (2008). Successful implementation of an alcohol-withdrawal pathway in a general hospital. *Psychosomatics, 49*(4), 292-299.

Reynolds, K., Lewis, B., Nolen, J., Kinney, G., Sathya, B., & He, J. (2003). Alcohol consumption and risk of stroke: A meta-analysis. *JAMA, 289*(5), 579-588.

Roche, A.M., Freeman, T., & Skinner, N. (2006). From data to evidence, to action: Findings from a systematic review of hospital screening studies for high risk alcohol consumption. *Drug and Alcohol Dependence, 83*(1), 1-14. https://doi-org.ezproxy.uky.edu/10.1016/j.drugalcdep.2005.10.011

Sacks, J.J, Gonzales, K.R., Bouchery, E.E., Tomedi, L.E., & Brewer, R.D. (2015). 2010 National and state costs of excessive alcohol consumption. *American Journal of Preventive*

Medicine, 49(5), E73-E79.

Ycaza-Gutierrez, M.C., Wilson, L., & Altman, M. (2015). Bedside nurse-driven protocol for

management of alcohol/polysubstance abuse withdrawal. *Critical Care Nurse, 35*(6),

73-6. https://doi.org/10.4037/ccn2015194

Young, H. (2018). *Assessment of alcohol withdrawal syndrome incidence and identification of*

other correlating risk factors in patients admitted through the emergency department

(Doctoral dissertation). Retrieved from UKnowledge

https://uknowledge.uky.edu/dnp_etds/

Table 1

Demographic Characteristics of Adult Alcoholic Inpatients (n= 313)

	Total sample n (%)	Hospital A n (%)	Hospital B n (%)	Hospital C n (%)	Hospital D n (%)
Age, mean (SD)	52.8 (13.5)	54.1 (13.1)	56.9 (14.0)	53.4 (11.1)	46.5 (13.7)
Sex					
Male	231 (73.8%)	72 (87.8%)	56 (71.8)	57 (71.3%)	46 (63.0%)
Female	82 (26.2%)	10 (12.2%)	22 (28.2%)	23 (28.8%)	27 (37.0`%)
Race					
Caucasian	254 (81.1%)	62 (75.6%)	70 (89.7%)	59 (73.8%)	63 (86.3%)
Afr. Amer.	49 (15.7%)	17 (20.7%)	6 (7.7%)	17 (21.3%)	9 (12.3%)
Hispanic	4 (1.3%)	3 (3.7%)	0 (0%)	1 (1.3%)	0 (0%)
Indian	1 (0.3%)	0 (0%)	0 (0%)	0 (0%)	1 (1.4%)
Other	4 (1.3%)	0 (0%)	1 (1.3%)	3 (3.8%)	0 (0%)
Pac. Island	1 (0.3%)	0 (0%)	1 (1.3%)	0 (0%)	0 (0%)
	313	82	78	80	73
Note: Standard deviation (SD)					

Table 2

Demographic Characteristics among Survey Respondents (n= 24)

	Total sample *n* (%)
Frequency of AUD admits	
Rarely <2/month	4 (16.7%)
Sometimes 2-5/month	7 (29.2%)
Frequently >5/month	13 (54.2%)
Ordering the entire protocol	
Always	9 (37.5%)
Sometimes	14 (58.3%)
Create or Add to existing	1 (4.2%)
Professional role	
MD/DO	13 (54.2%)
APRN	9 (37.5%)
PA	2 (8.3%)
Years of Experience	
<2 years	3 (12.5%)
2-10 years	11 (45.8%)
>10 years	10 (41.7%)
	24
Note: Alcohol use disorder (AUD), Medical Doctor (MD), Doctor of Osteopathy (DO), Advanced Practice Registered Nurse (APRN), Physician Assistant (PA)	

Table 3

Characteristics of Outcome Variables (n= 395)

	Total sample	Hospital A	Hospital B	Hospital C	Hospital D
AW protocol initiated, *n* (%)	255 (64.6%)	44 (44.4%)	49 (50.0%)	80 (80.8%)	82 (82.8%)
Hospital LOS, median (IQR)	4 days (3-7)	4 days (2-6)	4 days (3-10)	6 days (4-13)	3 days (2-5)
ICU admits, *n* (%)	111 (28.1%)	13 (13.1%)	34 (34.7%)	35 (35.4%)	29 (29.3%)
ICU transfers, *n* (%)	39 (9.9%)	5 (5.1%)	9 (9.2%)	18 (18.2%)	7 (7.1%)
Mortality rate, *n* (%)	12 (3.0%)	3 (3.0%)	5 (5.1%)	2 (2.0%)	2 (2.0%)
# of BZDs given[1], median (IQR)	17mgs (5-41)	7mgs (2-22.3)	12mgs (4-37)	26.5mgs (9.8-57.4)	20.5mgs (7.5-40)
	n= 395	*n= 99*	*n= 98*	*n= 99*	*n= 99*

Note: Alcohol withdrawal (AW), Length of stay (LOS), Interquartile range (IQR), Intensive care unit (ICU), benzodiazepines (BZDs), milligrams (mgs)

[1]Median dosages among those who received benzodiazepines

Table 4

Frequencies of Missing Protocol Components of Initiated Protocol (n= 252)

	Total sample *n* (%)	Hospital A *n* (%)	Hospital B *n* (%)	Hospital C *n* (%)	Hospital D *n* (%)
Consults	5 (2.0%)	0 (0%)	1 (2.0%)	3 (3.8%)	1 (1.2%)
Labs	93 (36.5%)	22 (50%)	2 (4.1%)	29 (36.3%)	40 (48.8%)
Labs & consults	105 (41.2%)	11 (25%)	34 (69.4%)	32 (40%)	28 (34.1%)
Labs, meds & consults	27 (10.6%)	5 (11.4%)	11 (22.4%)	8 (10%)	3 (3.7%)
Labs & meds	16 (6.3%)	2 (4.5%)	0 (0%)	4 (5%)	10 (12.2%)
Meds & consults	4 (1.6%)	3 (6.8%)	0 (0%)	1 (1.3%)	0 (0%)
General, labs & consults	1 (0.4%)	1 (2.3%)	0 (0%)	0 (0%)	0 (0%)

Table 5

Correlation of Outcome Variables to Protocol Initiation

	AW Protocol initiated	AW Protocol not initiated	p value
Hospital LOS, median (IQR)	4 days (2-6)	4 days (3-9)	.09
BZDs mgs, median (IQR)	21.5mgs (8.6-50.5)	5mgs (2-19)	<.001
ICU transfers, *n* (%)	34 (13.3%)	5 (3.6%)	.002
Mortality, *n* (%)	6 (50%)	6 (50%)	.28
Note: Alcohol withdrawal (AW), length of stay (LOS), benzodiazepines (BZDs), interquartile range (IQR), intensive care unit (ICU), milligrams (mgs)			

Table 6

Frequencies of Influencing Factors for Protocol Implementation (n=47)

	Total sample *n* (%)
Factor	
Patient states abstinence from alcohol	10 (21.3%)
Unaware of patient drinking status	10 (21.3%)
Don't think patient drinks enough to withdraw	8 (17.0%)
Feel withdrawal not an issue during admission	7 (14.9%)
Concern for over-sedation	6 (12.8%)
Prefer to treat at own discretion	3 (6.4%)
Medically contraindicated	2 (4.3%)
Disapprove of benzodiazepine dosing	1 (2.1%)
Unfamiliar with protocol components	0 (0%)
	47

For Women	No more than 3 drinks on any single day or No more than 7 drinks per week
For Men	No more than 4 drinks on any single day or No more than 14 drinks per week

Figure 1. National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2018) Definition of Drinking at Low Risk for Developing AUD

% of Protocol Components Adherence

TOTAL SAMPLE: 1, 77, 22
HOSPITAL A: 0, 65, 35
HOSPITAL B: 0, 65, 35
HOSPITAL C: 3, 83, 14
HOSPITAL D: 0, 94, 6
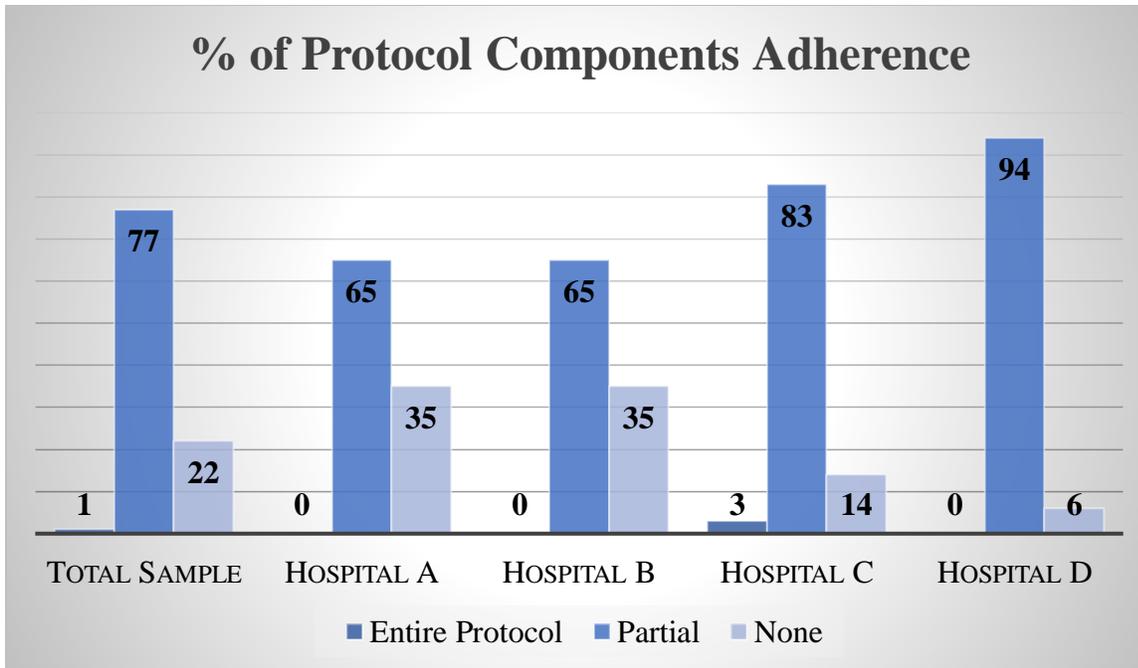
Entire Protocol   Partial   None

Figure 2. Comparison of Protocol Adherence Rates by Hospital (p=<.001)
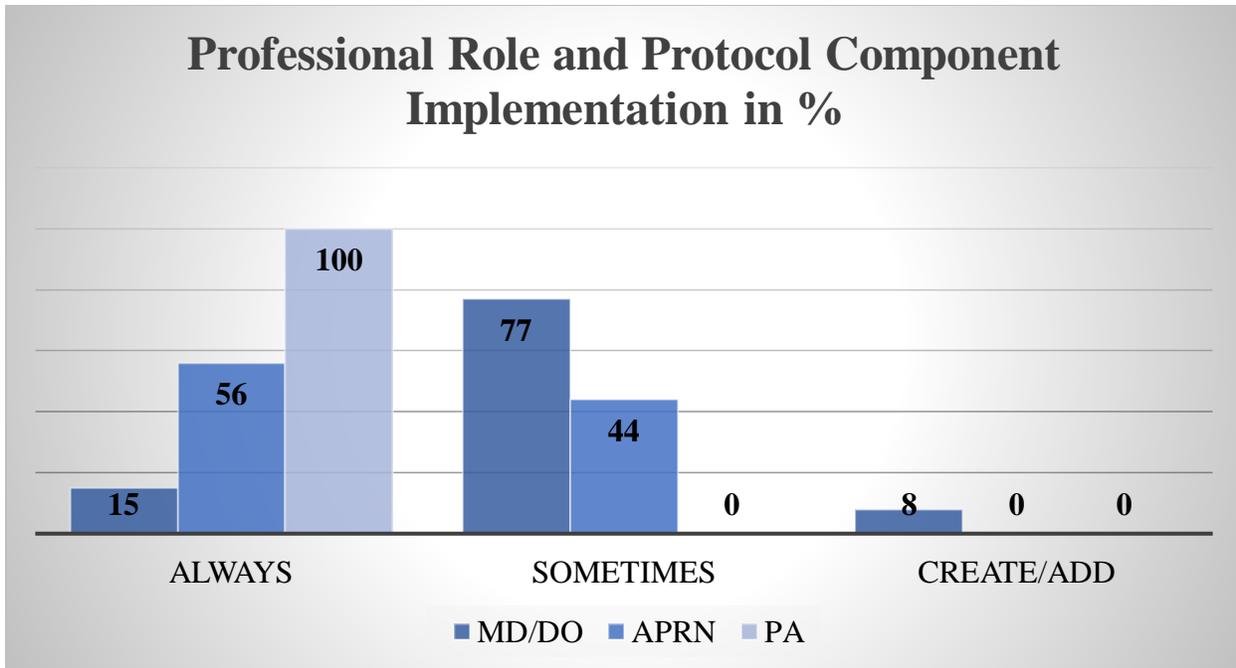
Figure 3. Correlation of Professional Role and Alcohol Withdrawal Protocol Implementation (p= .11)
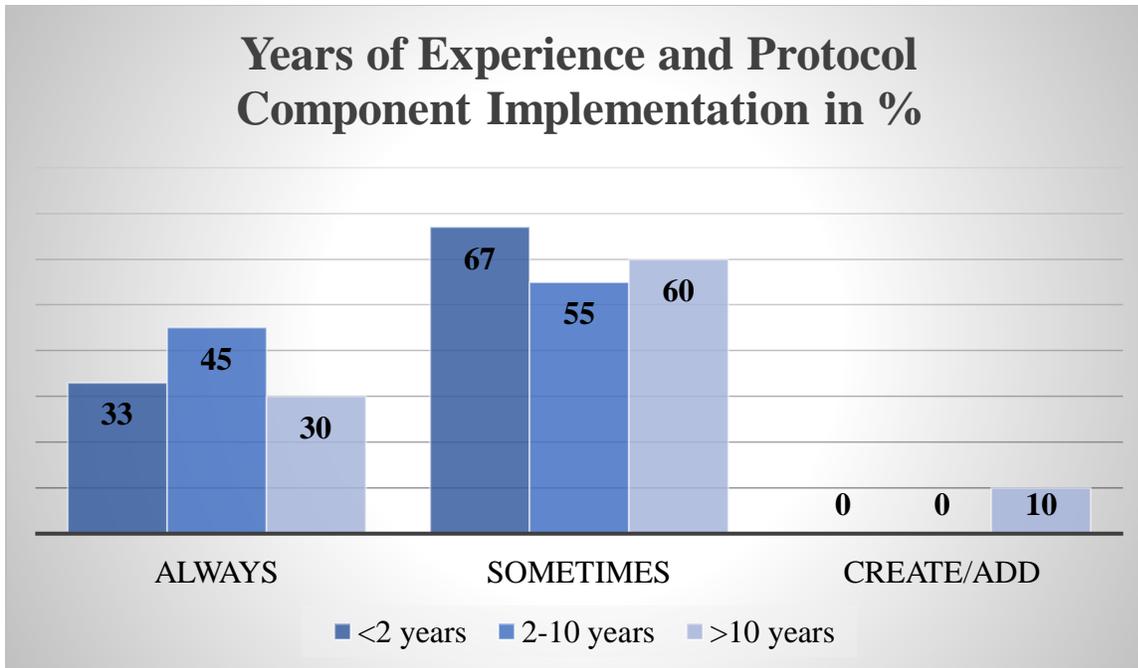
Figure 4. Correlation of Years of Experience and Alcohol Withdrawal Protocol Implementation ($p= .77$)