A nurse driven protocol to improve the management of complicated alcohol withdrawal syndrome in hospitalized patients

Robyn Barriffe

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A NURSE DRIVEN PROTOCOL TO IMPROVE THE MANAGEMENT OF
COMPLICATED ALCOHOL WITHDRAWAL SYNDROME IN HOSPITALIZED
PATIENTS

by

ROBYN BARRIFFE, MSN, RN, CCRN, CNML

A DNP PROJECT

Submitted in partial fulfillment of the requirements for the
Degree of Doctor of Nursing Practice
to
The School of Graduate Studies
of
The University of Alabama in Huntsville

HUNTSVILLE, ALABAMA
2018
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R. Baruffo

Student Signature

10/30/2018

Date
DNP PROJECT APPROVAL FORM

Submitted by Robyn Barriffe in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice and accepted on behalf of the Faculty of the School of Graduate Studies by the DNP project committee.

We, the undersigned members of the Graduate Faculty of The University of Alabama in Huntsville, certify that we have advised and/or supervised the candidate on the work described in this DNP project. We further certify that we have reviewed the DNP project manuscript and approve it in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice.

(Date)  
Committee Chair

Clinical Mentor/Adjunct Faculty

DNP Program Coordinator

College of Nursing, Associate Dean for Graduate Studies

College of Nursing, Dean

Graduate Dean
ABSTRACT
The School of Graduate Studies
The University of Alabama in Huntsville

Degree: Doctor of Nursing Practice College: Nursing

Name of Candidate: Robyn Barriffe

Title: A Nurse-Driven Protocol to Improve the Management of Complicated Alcohol Withdrawal Syndrome in Hospitalized Patients

A nurse driven alcohol withdrawal protocol implemented at a community hospital aimed to improve early recognition and treatment of patients at risk for complicated alcohol withdrawal syndrome. Patients affected with alcohol use disorder (AUD) have an abrupt cessation in alcohol consumption when hospitalized and are at risk for the life-threatening symptoms of complicated alcohol withdrawal syndrome. A quality improvement project incorporating the evidenced based tool, the Prediction of Alcohol Withdrawal Symptom Severity (PAWSS), into a nurse driven alcohol withdrawal protocol demonstrated improvement in early identification (p = 0.015) and treatment (p = 0.011) of patients at risk for complicated alcohol withdrawal syndrome. Patients in the quality improvement project had a significant reduction in hospital length of stay (p = 0.037) which translates to reduced healthcare expenses. Limitations of the study included the small sample size and short time period for data collection. Educating and arming nurses with compelling evidenced based research resulted in a statistically significant improvement in patient outcomes.
Running head: A NURSE DRIVEN PROTOCOL TO IMPROVE THE MANAGEMENT

Key words: Prediction of Alcohol Withdrawal Severity Scale (PAWSS), nurse driven protocol, complicated alcohol withdrawal syndrome

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TABLE OF CONTENTS

SECTION I: DNP PROJECT

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Identification of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>II.</td>
<td>Review of Evidence</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>a. Search Strategy</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>b. Alcohol Use Disorder in Hospitalized Patients</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>c. Pathophysiology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>d. Assessment Tools</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>i. Clinical Institute Withdrawal Assessment for Alcohol (revised)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>ii. CAGE Questionnaire</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>iii. Prediction of Alcohol Withdrawal Symptom Severity</td>
<td>6</td>
</tr>
<tr>
<td>III.</td>
<td>Conceptual Framework</td>
<td>8</td>
</tr>
<tr>
<td>IV.</td>
<td>Methodology</td>
<td>9</td>
</tr>
<tr>
<td>V.</td>
<td>Project Implementation</td>
<td>10</td>
</tr>
<tr>
<td>VI.</td>
<td>Results</td>
<td>12</td>
</tr>
<tr>
<td>VII.</td>
<td>Discussion</td>
<td>13</td>
</tr>
<tr>
<td>VIII.</td>
<td>References</td>
<td>17</td>
</tr>
<tr>
<td>IX.</td>
<td>Appendices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Clinical Institute Withdrawal Assessment for Alcohol (revised)</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>b. CAGE Questionnaire</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>c. Prediction of Alcohol Withdrawal Severity Scale</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>d. Conceptual Framework</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>e. Baseline Data Collection Tool</td>
<td>25</td>
</tr>
</tbody>
</table>
f. DNP Project Post Implementation Data Collection Tool………………..26

  g. Baseline Data………………………………………………………………..27

  h. IRB Approval University of Alabama in Huntsville…………………….28

  i. IRB Approval Swedish Covenant Hospital……………………………...31

j. Education Outline……………………………………………………………..32

k. Nurse Driven Protocol…………………………………………………...33

l. Two-Sided Educational Flyer……………………………………………37

m. DNP Project Budget……………………………………………………..39

n. Results: Post Implementation Nurse Driven Protocol………………….40
Identification of the Problem

Complicated alcohol withdrawal syndrome (AWS) is a life-threatening medical condition, and patients affected with alcohol use disorder (AUD) are susceptible to this potentially fatal syndrome when they experience an abrupt cessation in alcohol consumption (Holt, C., Dearman, V., Lawrence, S. M., Lewis, C. L., & Skotzko, C. E., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Melson, Kane, Mooney, McWilliams, & Horton, 2014; Mirijello et al., 2015; Perry, 2014). Alcohol use disorder, a prevalent, debilitating mental health condition resulting from a severe alcohol consumption problem, is one of the top three preventable causes of death in the United States (Grant et al., 2015; Maldonado et al., 2014; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2017). In the hospital setting alcohol consumption is interrupted and the AUD patient population is vulnerable to complicated alcohol withdrawal syndrome (AWS), which if not treated timely and appropriately, could lead to death (Holt et al., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Melson et al., 2014; Mirijello et al., 2015; Perry, 2014).

At the clinical site, an urban, community hospital in Illinois, nurse managers, bedside clinicians, and medical residents expressed challenges and concerns regarding management of AUD patients admitted for medical conditions to non-critical care areas. Patients affected by AUD often experience a range of symptoms from tremors and anxiety to hallucinations and delirium tremens, which can lead to death. In many cases confused, disoriented patients become violent and injure themselves and bedside clinicians. In addition, patients experiencing complicated AWS may experience increased lengths of stay, transfers to higher levels of care for more intensive treatment, increased mortality risk, and increased health care costs (Holt et al., 2016; Maldonado et al., 2014). Unfortunately, patients who progress to complicated AWS and
receive medical treatment are still vulnerable to serious and life-threatening complications. 
(Eberly, M., Lockwood, A., Lockwood, S., & Davis, K., 2016; Maldonado et al., 2014; 
Maldonado et al., 2015; Muzyk et al., 2013; Perry, 2014; Sachdeva et al., 2015). It is therefore, 
important to identify patients and initiate treatment early to prevent escalation of symptoms to a 
potentially life-threatening state.

As reported by Maldonado, et al. (2014), only an estimated 7% of physicians identify 
patients at risk for complicated AWS in the acute care setting. There is opportunity for registered 
nurses to play a key role in improving early identification and treatment of hospitalized AUD 
patients and thereby reduce the risk of complicated AWS and its potentially life-threatening 
consequences. The purpose of the Doctor of Nursing (DNP) project is implementation and 
evaluation of a nurse driven protocol with the aim to provide early detection and subsequent 
earlier treatment of AUD in the medically ill, hospitalized patients on medical-telemetry units 
who are at risk for complicated AWS. This project will demonstrate the importance of DNP 
competencies such as scientific underpinnings for nursing practice, leadership for quality 
improvements, analysis of evidenced based practice, and information technology (American 
Association of Colleges in Nursing [AACN], 2006). The DNP project will include use of an 
evidenced based tool as a component of the routine nursing admission assessment workflow. 
This will extend the existing alcohol withdrawal protocol, with the goal to improve early 
identification and treatment of patients at risk for complicated AWS. Evaluation of the DNP 
project will include appraisal of the timeliness of identification of patients at risk for complicated 
AWS, initiation of the alcohol withdrawal order set, appropriateness of transfers to the Intensive 
Care Unit (ICU)/Intermediate Care Unit (IMCU), decreased length of stay, and decreased health 
care costs.
Review of Evidence

A literature search of CINAHL, Ovid, PubMed, Science Direct, and SCOPUS included the following key terms alcohol use disorder identification test (AUDIT), prediction alcohol withdrawal, clinical institute withdrawal for alcohol (CIWA), nursing assessment alcohol withdrawal. Selection criteria included English language, articles written within 5 years, Boolean phrase, adults over age 18 years, and research article. The search yielded 1929 articles, of which duplicates were removed. Articles were reviewed and selected based on relevance to the acute care hospital setting, non-critical care patients, and evidenced based tools for alcohol withdrawal. Sixty-four articles were reviewed with twelve articles selected for inclusion. AUD statistics from the CDC and NIAAA were also included.

Alcohol Use Disorder in Hospitalized Patients

Hospitalized patients with AUD may be at risk for alcohol withdrawal within 24 hours of alcohol cessation (Holt et al., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Mirijello et al., 2015; Perry, 2014). The symptoms of mild to moderate AWS are tremors, sleeplessness, and moderate changes in vital signs (Holt et al., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Melson et al., 2014; Mirijello et al., 2015; Perry, 2014). Only an estimated 20% of AUD patients will progress to complicated AWS and experience a range of symptoms from diaphoresis, tremors, disorientation, and GI disturbances to hallucination, seizures, and delirium tremens; if these patients are not treated timely and appropriately, they are at risk for death (Holt et al., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Melson et al., 2014; Mirijello et al., 2015; Perry, 2014).

In the absence of effective alcohol withdrawal protocols, the increased length of hospital stays, and worsening of symptoms result in increased utilization of health care resources such as
sitters, rapid response teams, and transfers to higher levels of care which translate to higher health care costs (Holt et al., 2016; Maldonado et al., 2014 Melson et al., 2014;). Muzyk et al., (2017) reported an average length of stay of five days for hospitalized patients with complicated AWS. In the study, implementation of an alcohol treatment pathway improved identification of AWS, and early initiation of treatment resulted in a one day decrease in average LOS (CI 95%) (Muzyk et al., 2017). In another study, Holt et al., (2016) reported a 40% decrease in length of stay (6.21 days to 3.70 days, p = < 0.001) in patients experiencing AWS following the implementation of an alcohol withdrawal protocol. Conversely, Perry (2014) reported a national average length of stay of 5.4 days for non-critical care patients admitted to acute care hospitals for AWS management. The average cost of health care per inpatient day in the United States in 2015 was $2,271 (Henry J. Kaiser Family Foundation, 2015). At the clinical site the baseline patient population of 47 AUD admitted, non-critical care patients had an average length of stay of 7.11 days. In a six-month period, the average cost for 47 complicated AWS patients at the clinical site would be $758,900 (47 patients x 7.11 average length of stay days x $2,271 per inpatient day). This amount is an estimated $200,000 more than the national average cost of care for the same number of patients, $576,379 (47 patients x 5.4 average length of stay days x $2,271 per inpatient days).

Pathophysiology.

Complicated AWS is a complex medical condition with life threatening complications (Holt et al., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Melson et al., 2014; Mirijello et al., 2015; Perry, 2014). The long-term effects of alcohol consumption disrupt the function of CNS neurotransmitters. There is a compensatory decrease of GABA (inhibitory) receptors and an increase of N-methyl-D-aspartate (excitatory) receptors (Eberly et al., 2016; Kattimani et al.,
When alcohol consumption is abruptly stopped, the compensatory state of the CNS results in autonomic excitability and the manifestation of alcohol withdrawal symptoms (Eberly et al., 2016; Kattimani et al., 2013; Maldonado et al., 2015; Mirijello et al., 2015; Muzyk et al., 2013; Perry, 2014; Sachdeva et al., 2015). In the early phase of AWS, patients may experience tremors, diaphoresis, insomnia, nausea, and vomiting; these symptoms may resolve on their own or patients may receive medication, such as benzodiazepines, to help alleviate symptoms (Eberly et al., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Melson et al., 2014; Mirijello et al., 2015; Muzyk et al., 2013; Perry, 2014; Sachdeva et al., 2015). As AWS progresses to complicated AWS, patients may experience hallucinations, seizures, and delirium tremens; if untreated, approximately 15% of patients experiencing delirium tremens will die (Eberly et al., 2016; Maldonado et al., 2014; Maldonado et al., 2015; Melson et al., 2014; Muzyk et al., 2013; Perry, 2014; Sachdeva et al., 2015). For patients who survive this potentially fatal condition, there is risk for neuronal degeneration, increased risk for cerebral vascular disease, and other alcohol related conditions such as Wernicke’s encephalopathy and Korsakoff’s syndrome which result from impaired thiamine absorption and lead to cognitive impairment and psychosis (Donnelly, 2017; Maldonado et al., 2015).

Assessment Tools

Clinical Institute Withdrawal Assessment for Alcohol (revised) (CIWA-Ar).

The Clinical Institute Withdrawal Assessment for Alcohol (revised) (CIWA-Ar) is the most widely used tool for the assessment of alcohol withdrawal (Eloma, A. S., Tucciarone, J. M., Hayes, E. M., & Bronson, B. D., 2017; Maldonado et al., 2015) (see Appendix A). CIWA-Ar is well validated in mild to moderate alcohol withdrawal with a high inter-rater reliability (r> 0.8).
A shortened version of the original thirty-question CIWA, the CIWA-Ar measures 10 alcohol withdrawal related symptoms including nausea, vomiting, tremors, diaphoresis, anxiety, agitation, headache, orientation, and auditory and visual hallucinations (Eberly et al., 2016; Eloma et al., 2017; Maldonado et al., 2015; Mirijello et al., 2015; Perry, 2014; Sachdeva et al., 2015; Sullivan, Sykora, Schneiderman, Naranjo, & Sellers, 1989). Each of the afore mentioned alcohol withdrawal symptoms are scored on the CIWA-Ar tool; a CIWA-Ar score < 8 indicates mild to no symptoms of alcohol withdrawal and a score > 8 is indicative of moderate to severe complicated AWS. CIWA-Ar only assesses the symptoms of complicated AWS. It does not predict risk for complicated AWS or identify patients who may benefit from prophylaxis, which can prevent patients from escalating to life-threatening conditions associated with complicated AWS (Feeney et al., 2015; Maldonado et al., 2014; Mirijello et al., 2015; Muzyk et al., 2013). Limitations of the CIWA-Ar are notable in that it is validated only in mild to moderate AWS and excludes patients with histories of seizures and exclusion of vital signs, which are key indicators of the autonomic excitability that occurs in alcohol withdrawal (Maldonado et al., 2015; Muzyk et al., 2013; Perry, 2014).

**CAGE Questionnaire.**

The CAGE questionnaire is a four-item assessment that examines patient alcohol consumption history with a sensitivity of 71% and a specificity of 90% (Ewing, 1984) (see Appendix B). The CAGE questionnaire, part of the nursing admission assessment at the clinical site, is only validated in measuring the probability of alcoholism and the need for further evaluation (O’Brien, 2008). The CAGE is short and easy to complete; however, it yields no prediction for risk of complicated AWS.

**Prediction of Alcohol Withdrawal Severity Scale.**
The Prediction of Alcohol Withdrawal Severity Scale (PAWSS) is a measurement tool designed to predict complicated AWS in medical, non-ICU, hospitalized patients (Maldonado et al., 2014; Maldonado et al., 2015) (see Appendix C). The tool, a ten-item questionnaire developed from a comprehensive review and analysis, is comprised of relevant clinical indicators for complicated AWS (Maldonado et al., 2014; Maldonado et al., 2015). In a yearlong study of 409 participants at a major university medical center, the PAWSS demonstrated 93.1% sensitivity (95% CI) and 99.5% specificity (95% CI) in recognizing complicated alcohol withdrawal syndrome (Maldonado et al., 2015). The PAWSS tool’s ability to identify patients at risk for complicated AWS affords an opportunity for appropriate prophylactic treatment early in the hospital stay (Maldonado et al., 2015). A limitation identified in this study is asymptomatic patients whom the clinical team suspected to be at risk for complicated AWS, were treated prophylactically for alcohol withdrawal and thus, did not exhibit symptoms of alcohol withdrawal. (Maldonado et al., 2015). These patients were, however, included in the complicated AWS patient population based on clinical evidence and probability of developing complicated alcohol withdrawal syndrome if left untreated (Maldonado et al., 2015). The PAWSS study had two false positive and two false negative results; further chart review identified an error in data collection and inaccurate information received in patient interview (Maldonado et al., 2015). PAWSS demonstrated statistically significant reliability and sensitivity for prediction of complicated alcohol withdrawal syndrome (Maldonado et al., 2015). The tool identifies AUD medically ill, hospitalized patients who are at risk for potentially life-threatening complications associated with complicated AWS. PAWSS provides opportunity to appropriately prophylax patients at risk for complicated AWS with minimal risk for administering unnecessary prophylaxis to patients not at risk for complicated AWS (Maldonado et al., 2015).
There is a need to improve the management of patients at risk for complicated AWS in the acute care setting. There are several tools available to assess alcohol consumption and symptoms, but PAWSS is the most reliable, validated tool for predicting the risk for complicated AWS (Maldonado et al., 2015). A nurse-driven protocol incorporating the PAWSS assessment provides a quality improvement opportunity for patients at risk for complicated AWS. The DNP possesses the competencies necessary for effective leadership in the implementation of a nurse driven protocol to improve the identification and management of patients at risk for complicated AWS.

**Conceptual Framework: Bureaucratic Theory of Caring**

The Bureaucratic Theory of Caring integrates concepts of caring and organizational culture (Mac Leod Dyess, Prestia, & Smith, 2015). This theory provides a framework consisting of seven elements that influence caring in organizations: education, physical, sociocultural, legal, economic, political, and technological (Smith & Parker, 2015). Organizational culture is either enhanced or diminished by these elements, where the organization is a sum of its parts; for a caring organizational culture to endure, the members of the organization must exhibit and experience caring (Smith & Parker, 2015). Nurse executives must provide critical analysis to health care issues after examining evidence, provide fiscal leadership, and illuminate the clinical experience as it pertains to nursing in organizational decisions, support patient and employee safety, as well as advocate for patients and families (American Nurses Association, 2015).

The Bureaucratic Theory of Caring provides an expansive framework that provides context for the nurse executive to evaluate the implications of patients experiencing complicated AWS in the acute care setting. Each concept provides a unique perspective for examining both the problem and nursing interventions affecting the patient, family, nurse, and organization (see
Appendix D). By incorporating the Bureaucratic Theory of Caring as a framework for care of patients at risk for AWS, the nurse executive creates a spiritual-ethical caring experience for the AUD patient population (Turkel, 2007).

**Methodology**

The DNP scholarly project is a quality improvement project utilizing a convenience sampling method. The selected clinical site is a 312-bed, urban, teaching, community, Magnet-designated hospital in Illinois, USA. The AUD patient population is an estimated 5-6% of the 12,000 annual patient admissions. Fifty-seven percent of the patients identified as at risk for complicated AWS were located on three medical-telemetry units during the six-month baseline data collection period. These three units were chosen for inclusion in the DNP scholarly project because of the volume of similar, non-critical care, medical-telemetry patients.

A 17-item data collection tool was developed for collection of baseline data for the following data elements: unique patient identifier, patient location/unit, admission date, length of stay, gender, age, CAGE assessment initiation, time to CAGE assessment, CAGE score, CIWA-Ar assessment initiation, time to CIWA-Ar assessment, peak CIWA-Ar, order set use, time to order set initiation, order set initiated before CIWA-Ar > 8, transfer to critical care, and alive at discharge (see Appendix E). The baseline data collection tool was modified for the post implementation phase of the project replacing data items related to the CAGE questionnaire with: PAWSS initiation, PAWSS assessment time, and PAWSS score (see Appendix F). Baseline data was collected for a period of six months from June 2017 through December 2017; three hundred and eighty-one AUD patient charts were reviewed (see Appendix G). Patients admitted for surgical procedures, admitted to critical care (ICU/IMCU), and treated for alcohol withdrawal in the Emergency Department were excluded. The resulting AUD patient population...
consisted of 47 patients, with an average length of stay of 7.11 days (mean 4.0). The average
time to initial alcohol history assessment was 107.88 hours (mean 78); the average time to the
first CIWA-Ar assessment was 243.32 minutes (mean 159) and order set initiation was on
average 230.05 minutes (mean 124).

Project Implementation

Following IRB approval at the UAH and clinical site, the DNP scholar provided
education to nurse leaders, charge nurses, bedside nurse clinicians, nurse practitioners, physician
assistants, medical residents, and attending physicians (see Appendices H & I). Education
included identification of the problem, baseline data at the clinical site, AWS pathophysiology,
the PAWSS tool, and review of the extended alcohol withdrawal protocol (see Appendices J
&K). Discussion included baseline data, opportunities for improvement, and project aim. Daily
huddles following the education sessions provided an opportunity on the three medical-telemetry
units for assessment of the unit culture for readiness to engage in the project. Staff provided
feedback, asked questions, and received additional information when requested. Each of the
three units received educational binders. Each binder contained the PAWSS tool, two articles,
“The Prediction of Alcohol Withdrawal Severity Scale (PAWSS): Systematic Literature Review
and Pilot Study of a New Scale for the Prediction of Complicated Alcohol Withdrawal
Syndrome” and “Prospective Validation Study of the Prediction of Alcohol Withdrawal Severity
Scale (PAWSS) in Medically Ill Patients: A New Scale for the Prediction of Complicated
Alcohol Withdrawal Syndrome”, and a copy of the extended CIWA-Ar protocol (Maldonado et
al., 2014; Maldonado et al., 2015). Dissemination of information included flyers sent via email
and posted on the three medical-telemetry units and in the physician, nurse practitioner, and
physician assistant areas (see Appendix L).
Support was obtained in meetings with stakeholders which included an overview of the project. The stakeholders included nurse managers, nursing staff, medical residents, physicians, hospitalists, nurse practitioners, and medical directors. Stakeholders agreed on the need for improved care for the hospitalized AUD patient population. Discussion and review of the PAWSS tool and comparison to the existing alcohol assessment tool yielded a consensus to move forward with implementation of the PAWSS in the electronic health record (EHR).

In collaboration with the nurse informaticist at the clinical site, the PAWSS tool was incorporated into the existing nursing admission assessment. The new workflow included a recreation of the paper form of the PAWSS in the test environment of the EHR. Testing the accuracy of the PAWSS assessment in the HER included test patients created by the nurse informaticist. The appropriate questions and corresponding answers functioned appropriately in the electronic test environment. Initially, the PAWSS numerical score was not displaying on the screen as intended. This was concerning because the nurse is expected to initiate the alcohol withdrawal protocol for a PAWSS score $\geq 4$. In partnership with the clinical informaticist, after addressing identified problems and revisions made, and the PAWSS assessment was ready to launch.

Financial expenses for the project implementation were minimal (See Appendix M). The largest expense was the in-kind salary expense of $11,115 for data abstraction, meetings and education. Other costs of $200.00 were for office supplies (binders, document protectors, and paper) as well as marketing materials to promote awareness and team engagement.

The implementation of screening patients with the PAWSS tool launched in July 2018. A weekly report created by the business analyst team included all patients discharged with an alcohol related diagnosis. The DNP scholar conducted weekly chart reviews assuring HIPAA
compliance and screened each chart for inclusion criteria from the three chosen telemetry units (patients admitted and not previously treated for AUD in the emergency department and not admitted to critical care or for a surgical procedure). The DNP scholar recorded data for appropriate patients on the data collection tool and later transferred the de-identified data to SPSS for statistical analysis. The DNP reviewed 143 charts; 22 patients met inclusion criteria. This student excluded 121 based on exclusion criteria used for baseline data collection: surgical patients, critical care patients, not admitted to one of the selected three medical-telemetry units, and any patients treated for AWS in the ED.

**Data analysis.**

Statistical analysis for assumption of normality for pre and post length of stay, time to CIWA-Ar assessment, and time to order set initiation data demonstrated a negative skew in both pre and post data sets, as evidenced by a histogram shifted to the left. Based on these findings, a non-parametric analysis was conducted using Mann-Whitney U and Wilcoxon W statistical tests. A non-parametric statistical analysis of the gender of both patient populations used Chi-Square. The pre and post data elements time to initiation of alcohol assessment (CAGE questionnaire and PAWSS) and age met the assumption of normality. A $t$ test statistical analysis examined differences in the initiation of CAGE and PAWSS assessments

**Results**

There was no statistically significant difference in the age or gender in the pre and post group (Appendix N). A $t$ test statistical analysis of the mean age pre (48.7 years) and post (53.6 years) showed no statistical difference ($p = 0.208$). A Chi-Square analysis demonstrated no statistical difference in gender between the two groups ($p = 0.46$). Both the pre and post patient populations were similar in average age and gender.
The baseline population utilized the CAGE questionnaire for initial alcohol history screening and the DNP project patient population used PAWSS for initial alcohol history screening. A $t$ test statistical analysis revealed no statistically significant difference in the time of initiation of the assessment. Successful integration of the PAWSS assessment into the admission workflow occurred because it integrated into the EHR at the same point in the admission workflow as the CAGE assessment, as intended.

Non-parametric analysis of the length of stay, time to initiation of CIWA-Ar assessment, and time to initiation of the order set demonstrated improvement in the DNP project population compared to baseline (see Table 1). Using the Mann-Whitney $U$ and Wilcoxon $W$ statistical tests, the baseline median length of stay of 4.0 days was improved to a median length of stay of 2.5 days ($p = 0.037$; interquartile range of 6.5 days). Similarly, the post median time to initiation of the CIWA-Ar assessment, 64 minutes, was reduced to less than half the median time to initiation at baseline, 159 minutes ($p = 0.011$). Lastly, using the same statistical tests, the median time to order set initiation at baseline was 124 minutes and post project implementation median time to order set initiation was reduced to 50 minutes ($p = 0.015$). There was no statistically significant difference in the number of patients transferred to higher level of care (Chi-Square, $p = 0.31$).

Discussion

PAWSS is a valid, reliable tool that improves early identification of patients at risk for complicated AWS (Maldonado et al., 2014; Maldonado et al., 2015). The performance of the nurse driven protocol enables nurses to confidently assess the risk of complicated alcohol withdrawal and initiate the protocol early in the hospital stay. In the post project implementation patient population, there were no false positive PAWSS screens. All patients who scored $\geq 4$,
exhibited symptoms correlating to a CIWA score of >8. One patient had a false negative score. The patient had a drinking history of > 40 years and stopped drinking five days before hospital admission. The patient answered no to all questions and did not have a blood alcohol level drawn on admission. The patient did go into alcohol withdrawal syndrome on the second day of hospitalization. As recommended by Maldonado et al. (2015), the PAWSS tool should be used in conjunction with patients’ past medical history for a more robust assessment of patients’ alcohol consumption history. There were no false positives and no evidence patients were unnecessarily medicated identified during data collection and chart review. The outcomes of the DNP project support the confidence of the healthcare team in the nurse driven protocol as the subsequent treatment relies on a valid assessment tool that improves patient and organizational outcomes.

The PAWSS tool easily and successfully integrated into the existing nursing admission workflow. There was no statistically significant difference in the time of initiation of the PAWSS assessment compared to the initiation of the CAGE assessment in the baseline patient population. In the future, the implementation of the PAWSS and nurse driven protocol in other non-critical care areas in the acute care setting enable standardization in the management of patients at risk for complicated alcohol withdrawal syndrome.

The nurses driven protocol improved the timeliness of identification and treatment of patients at risk for complicated alcohol withdrawal syndrome. The median time to the initial CIWA-Ar assessment decreased by 94.5 minutes ($p = 0.011$), and the median time to initial order set initiation was reduced by 74 minutes ($p = 0.015$). There was a decrease in the median length of stay of 1.5 days. This reduction in the median length of stay provides a significant potential decrease in health care costs. The healthcare costs for 47 patients with a median length of stay of
4 days at $2,271/patient day are an estimated $427,000. A reduction in the median length of stay to 2.5 days at $2,271/patient day is $267,000, resulting in an estimated savings of $160,000 in six months and potentially $320,000 in a year. It is important for the DNP to not only implement evidenced based practice in the healthcare setting, as a leader the DNP needs to help hospital administration understand the value of evidenced based practice in reducing health care costs. As health care expenses continue to increase with new technologies and treatments, hospital administrators often seek to reduce costs by reducing nursing FTEs. They may fail to recognize the benefit of reducing costs with quality improvement initiatives like the nurse driven protocol while keeping the nursing workforce intact. The DNP project makes the case for decreased healthcare costs as a result of a nurse driven protocol and illuminates the opportunity to use evidenced based practice to improve patient outcomes across the healthcare spectrum and reduce healthcare expenses.

Increased awareness of the nurse-driven protocol resulting from the educational in-services, huddles, and flyers may have contributed to the improvement in time to CIWA-Ar assessment and the order set. Education session with the nurses included a focus on the half-lives of medications used to treat complicated alcohol withdrawal symptoms. The residents historically ordered lorazepam for all patients experiencing alcohol withdrawal symptoms. Using the nurse driven protocol, the nurses drove the use of diazepam in appropriate patients. The nurses were empowered with their understanding of the pathophysiology of the disease and the appropriate pharmacological and nursing interventions.

There were no statistically significant differences in the number of transfers from the medical-telemetry units to the ICU or IMCU. The baseline patient population had 10 of 46 patients transfer to ICU or IMCU and the post patient population had two of 19 patients transfer
to ICU or IMCU ($p = 0.31$). There was insufficient data to analyze the impact of the nurse driven protocol on mortality and transfers to higher levels of care.

**Limitations**

Limitations of the DNP project were small sample size and time for data collection. The post patient population consisted of 22 patients. Due to academic time constraints, data collection spanned a 10-week period. The sample was too small for parametric statistical analysis; however, non-parametrical tests did prove a statistically significant reduction in length of stay and early identification and initiation of treatment in patients at risk for complicated AWS. CIWA-Ar is widely used as an assessment tool for symptoms of alcohol withdrawal, with a high inter-rater reliability (> 0.8); the ratings, based on the perception of different nurses may not be interpreted consistently. Lastly, the PAWSS assessment depends on patient feedback and it is impossible to verify the accuracy of all patient responses. Consideration of these limitations are taken into account in the evaluation of the DNP project outcomes.
References


Appendix A

Clinical Institute Withdrawal Assessment for Alcohol Revised (CIWA-Ar)

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Appendix B

CAGE Questionnaire

- Have you ever felt you should cut down on your drinking?
- Have people annoyed you by criticizing your drinking?
- Have you ever felt bad or guilty about your drinking?
- Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (eye opener)?

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Appendix C

Prediction of Alcohol Withdrawal Severity Scale (PAWSS)

Part A: Threshold Criteria:
Have you consumed any amount of alcohol (i.e., been drinking) within the last 30 days? OR did the patient have a "+" BAL on admission?
IF the answer to either is YES, proceed with test:

Part B: Based on patient interview:
1. Have you been recently intoxicated/drunk, within the last 30 days?
2. Have you ever undergone alcohol use disorder rehabilitation treatment or treatment for alcoholism?
(i.e., in-patient or out-patient treatment programs or AA attendance)
3. Have you ever experienced any previous episodes of alcohol withdrawal, regardless of severity?
4. Have you ever experienced blackouts?
5. Have you ever experienced alcohol withdrawal seizures?
6. Have you ever experienced delirium tremens or DT's?
7. Have you combined alcohol with other "downers" like benzodiazepines or barbiturates, during the last 90 days?
8. Have you combined alcohol with any other substance of abuse, during the last 90 days?

Part C: Based on clinical evidence:
9. Was the patient’s blood alcohol level (BAL) on presentation ≥ 200?
10. Is there evidence of increased autonomic activity?
(e.g., HR > 120 bpm, tremor, sweating, agitation, nausea)

Total Score: ______

Notes: Maximum score = 10. This instrument is intended as a SCREENING TOOL. The greater the number of positive findings, the higher the risk for the development of AWS. A score of ≥ 4 suggests HIGH RISK for moderate to severe (complicated) AWS; prophylaxis and/or treatment may be indicated.

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Appendix D

Conceptual Framework: Bureaucratic
### Appendix E

Baseline Data Collection Tool

<table>
<thead>
<tr>
<th><strong>Baseline Data Collection Tool</strong></th>
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<tbody>
<tr>
<td><strong>Patient ID</strong></td>
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<tr>
<td><strong>Admit Date</strong></td>
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<tr>
<td><strong>LOS</strong></td>
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<tr>
<td><strong>Gender:</strong></td>
</tr>
<tr>
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<tr>
<td>2=female</td>
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<tr>
<td><strong>Age</strong></td>
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<tr>
<td><strong>CAGE Asmt 1=Y</strong></td>
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<tr>
<td><strong>CAGE Min</strong></td>
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<tr>
<td><strong>CIWA Min</strong></td>
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<tr>
<td><strong>CIWA Peak</strong></td>
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<tr>
<td><strong>Order Set 1=Y 2=N</strong></td>
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<td><strong>Order Min</strong></td>
</tr>
<tr>
<td><strong>Order set before CIWA &gt; 8 1=Y 2=N</strong></td>
</tr>
<tr>
<td><strong>Transfer ICU/IMCU 1=Y 2=N</strong></td>
</tr>
<tr>
<td><strong>DC Alive 1=Y 2=N</strong></td>
</tr>
</tbody>
</table>
Appendix F

DNP Project Post-Implementation Data Collection Tool

| **DNP Project Data Collection Tool**          |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|----------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|        |
| Patient ID                                   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Unit                                         |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Admit Date                                   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| LOS                                          |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Gender: 1=male 2=female                       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Age                                          |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| PAWSS Asmt 1=Y 2=N                           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| PAWSS Min                                    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| PAWSS Score                                  |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| CIWA Asmt 1=Y 2=N                            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| CIWA Min                                     |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| CIWA Peak                                    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Order Set 1=Y 2=N                            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Order Min                                    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Order set before CIWA > 8 1=Y 2=N            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Transfer ICU/IMCU 1=Y 2=N                    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| DC Alive 1=Y 2=N                             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
Appendix G

Baseline Data Pre-Project Implementation

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<td><strong>Age</strong></td>
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<td><strong>Admission to CAGE (minutes)</strong></td>
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<td><strong>Admission to CIWA-Ar</strong></td>
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<td>159</td>
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<td><em>Assessment (minutes) n=47</em></td>
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<tr>
<td><strong>Admission to Order Set (minutes)</strong></td>
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<td><strong>4E</strong></td>
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<td><strong>4N</strong></td>
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</tr>
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</tr>
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<td><strong>7E</strong></td>
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<td><strong>AP5</strong></td>
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<td><strong>All Units</strong></td>
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Appendix H

IRB Approval University of Alabama in Huntsville

July 2nd 2018

Robyn Jackson
Department of Nursing
University of Alabama in Huntsville

Dear Mrs. Jackson,

The UAH Institutional Review Board of Human Subjects Committee has reviewed your proposal, *A Nurse-driven Protocol to Improve Early Identification and Management of Complicated Alcohol Withdrawal Syndrome in Hospitalized Patients*, and found it meets the necessary criteria for approval. Your proposal seems to be in compliance with this institutions Federal Wide Assurance (FWA) 00019998 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

Please note that this approval is good for one year from the date on this letter. If data collection continues past this period, you are responsible for processing a renewal application a minimum of 60 days prior to the expiration date.

No changes are to be made to the approved protocol without prior review and approval from the UAH IRB. All changes (e.g. a change in procedure, number of subjects, personnel, study locations, new recruitment materials, study instruments, etc.) must be prospectively reviewed and approved by the IRB before they are implemented. You should report any unanticipated problems involving risks to the participants or others to the IRB Chair.

If you have any questions regarding the IRB’s decision, please contact me.

Sincerely,

Bruce Stallsmith

Bruce Stallsmith

28
Clinical studies of drugs and medical devices only when condition (a) or (b) is met. (a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review. (b) Research on medical devices for which (i) an investigational device exemption application (21 CFR Part 812) is not required; or (ii) the medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.

Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows: (a) from healthy, nonpregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8 week period and collection may not occur more frequently than 2 times per week; or (b) from other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8 week period and collection may not occur more frequently than 2 times per week.

Prospective collection of biological specimens for research purposes by noninvasive means. Examples: (a) hair and nail clippings in a nondisfiguring manner; (b) deciduous teeth at time of exfoliation or if routine patient care indicates a need for extraction; (c) permanent teeth if routine patient care indicates a need for extraction; (d) excreta and external secretions (including sweat); (e) uncanulated saliva collected either in an unstimulated fashion or stimulated by chewing gum base or wax or by applying a dilute citric solution to the tongue; (f) placenta removed at delivery; (g) amniotic fluid obtained at the time of rupture of the membrane prior to or during labor; (h) supra- and subgingival dental plaque and calculus, provided the collection procedure is not more invasive than routine prophylactic scaling of the teeth and the process is accomplished in accordance with accepted prophylactic techniques; (i) mucosal and skin cells collected by buccal scraping or swab, skin swab, or mouth washings; (j) sputum collected after saline mist nebulization.

Collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications).

Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

Collection of data from voice, video, digital, or image recordings made for research purposes.

Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Exempt

Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (a) research on regular and special education instructional strategies, or (b) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods. The research is not FDA regulated and does not involve prisoners as participants.

Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interviews, or observation of public behavior in which information is obtained in a manner that human subjects cannot be identified directly or through identifiers linked to the subjects and any disclosure of the human subject’s responses outside the research would NOT place the subjects at risk of criminal or civil liability or be damaging to the subject’s financial standing, employability, or reputation. The research is not FDA regulated and does not involve prisoners as participants.

Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement) survey procedures, interview procedures, or observation of public behavior if (a) the human subjects are elected or appointed public officials or candidates for public office, or (b) Federal statute(s) require(s) without exception that the confidentiality of the personally identifiable
information will be maintained throughout the research and thereafter. The research is not FDA regulated and does not involve prisoners as participants.

Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. The research is not FDA regulated and does not involve prisoners as participants.

Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs. The protocol will be conducted pursuant to specific federal statutory authority; has no statutory requirement for IRB review; does not involve significant physical invasions or intrusions upon the privacy interests of the participant; has authorization or concurrent by the funding agency and does not involve prisoners as participants.

Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture. The research does not involve prisoners as participants.

Surveys, interviews, or observation of public behavior involving children cannot be exempt.
Appendix I

IRB Approval Swedish Covenant Hospital

Institutional Review Board
Swedish Covenant Hospital
5145 North California Avenue, Chicago, Illinois 60625
773/878-8200, extension 4726

February 28, 2018
(Sent 3/6/18)

R. Jackson, MSN, RN, CCRN, CNML
511 Glenshire Road
Glenview, IL 60025

RE: Nurse Driven Alcohol Withdrawal Protocol
SCH Protocol # 2018022801

Dear R. Jackson, MSN, RN, CCRN, CNML:

The following items have been received and reviewed: Protocol as described in IRB application, Prediction of Alcohol Withdrawal Severity Scale, Nurse Driven Alcohol Withdrawal Assessment and Intervention, Clinical Institute Withdrawal Assessment-Ar Protocol, and the Alcohol Withdrawal Order Set.

The Institutional Review Board (IRB) has granted full approval for the project as of February 28, 2018 for a 12 month time period ending February 27, 2019. This approval is based on the protocol as described in IRB application appendices. Approval applies to the use of human subjects only and does not constitute scientific approval of the project. IRB approval is given with the understanding that no changes may be made in the procedures to be followed or the consent form(s) to be used until such modifications have been submitted to the IRB for review and have been approved.

All unanticipated adverse events should be promptly reported to the IRB, appropriate SCH officials, FDA, and HHS within seven working days of the primary investigator or any member of the investigational team’s becoming aware of the occurrence or within three working days of the primary investigator or any member of the investigational team’s becoming aware of an unanticipated death or serious adverse event. Should a death occur while a subject is enrolled on an IRB approved protocol, a report should be made immediately including an assessment as to the cause. The IRB will notify the Quality and Risk Management Department at SCH, if necessary.

Approximately six weeks before the IRB meeting at which the project will receive continuing review, you will receive an application notifying you of the need for updated information and results to date. Return the completed application to the IRB. Regulations do not allow for delays.

If you have any questions don’t hesitate to call me or the IRB Coordinator, Alicia Juska, ext. 4726.

Sincerely,

[Signature]
Gary Schreiber, M.D.
Chair, Institutional Review Board

cc: file
Appendix J

Education Outline

Identification of the Problem

- Nationally
- Illinois
- SCH
- Pathophysiology of Alcohol Withdrawal
  - GABA and Glutamate pathways
  - Wernicke’s encephalopathy and Korsakoff’s psychosis
  - Complicated alcohol withdrawal
  - Delirium Tremens
  - Death
- PAWSS Assessment
- Medical Management
  - Thiamine, Multivitamins, Folic Acid
  - Magnesium
  - Smoking Cessation
  - Hydration (IV Fluids)
- CIWA-Ar Protocol
  - Accurate assessment
  - Score and medications: lorazepam and diazepam
  - Prophylaxis: Chlordiazepoxide, Gabapentin
  - Allergies to Benzodiazepines: phenobarbital
- Labs
- Other Diagnostic Tests
- Consult Social Worker and Dietician
- Non-pharmacological Interventions
  - Early mobilization
  - Encourage use of sensory aids
  - Promote circadian light rhythm
  - Promote night time sleep (no interruptions)
  - Family and friends visitation/intellectual stimulation
  - Seizure precautions
  - Fall precautions
  - Aspiration precautions
- Patient/Family Education and Community Resources
Appendix K

Nurse Driven Alcohol Withdrawal Protocol

Limitations to Protocol

1. For use in patients ≥ 18 years of age, in a non-ICU setting
2. Order for medical prophylaxis for risk of complicated alcohol withdrawal must be provided by physician, nurse practitioner, or physician assistant.

Indications:

1. All in patients ≥ 18 years of age, non-intubated patients, non-critical care patients in the acute care setting whose PAWSS score is ≥ 4 (at risk for complicated alcohol withdrawal syndrome).
2. Patient history indicates risk for complicated alcohol withdrawal syndrome.

Procedure:

1. Upon arrival to unit, screen patient with PAWSS assessment tool during admission assessment.
2. PAWSS score ≥ 4 indicates risk for complicated alcohol withdrawal syndrome, if score ≥ 4 initiate the following:
   a. CIWA-Ar protocol (see CIWA-Ar Protocol Reference Sheet)
   b. Nonpharmacological interventions
      i. Early mobilization
         1. Passive range of motion for bed bound patients
         2. Patients not on bed rest: out of bed as frequently as tolerated
         3. Patient up to chair and ambulating as frequently as tolerated
      ii. Encourage use of sensory aid (eye glasses, hearing aids)
      iii. Promote normal circadian light rhythm
         1. Light environment during day (natural light preferred) lights off at night
         2. Limit environmental noise (television off, ear plugs, minimize staff noise)
      iv. Promote nighttime sleep: minimum of 6 hours uninterrupted sleep (no interruptions unless necessary)
      v. Family and friend visitation to promote intellectual stimulation
      vi. Seizure precautions (refer to Seizure Precaution policy 08-122-06)
      vii. Fall precautions (refer to Fall Prevention Program policy 08-111-13)
3. For PAWSS score ≥4 obtain order for Alcohol Withdrawal Order Set and notify provider if any of the following is present:
   a. New onset delirium, hallucinations, confusion, agitation, seizures, diaphoresis, fever

33
Running head: A NURSE DRIVEN PROTOCOL TO IMPROVE THE MANAGEMENT

b. Abnormal vital signs: HR >100, or SBP >150 < 90, or RR < 10 > 26, or SpO2 < 92%, or etCO2 > 45 mmHg
c. CIWA-Ar score > 20
d. CIWA-Ar >15 x 2
e. No patient response to treatment (CIWA-Ar)

4. Consult:
   a. Social Worker
   b. Dietary

5. Initiate alcohol withdrawal and smoking (if applicable) problem on care plan

6. Education
   a. Patient and family – need for frequent reassessments to prevent complicated alcohol withdrawal syndrome (Maldonado, 2017)
   b. Smoking cessation (if applicable)

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<tr>
<th>Level</th>
<th>Goal: &lt; 8</th>
<th>A: 8-10</th>
<th>B: 11-14</th>
<th>C: 15-18</th>
<th>D: &gt; 18</th>
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<tbody>
<tr>
<td>CIWA-Ar Assessment Q4 x 6, then Q6 x 6, and pm (check HR, RR, BP, SpO2)</td>
<td>CIWA-Ar Assessment Q4 &amp; pm (check HR, RR, BP, SpO2)</td>
<td>CIWA-Ar Assessment Q2 &amp; pm (check HR, RR, BP, ETCO2)</td>
<td>CIWA-Ar Assessment Q1 &amp; pm (check HR, RR, BP, ETCO2)</td>
<td>Consult ICU fellow for recommendations and evaluation for appropriate level of care</td>
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<td>If using Diazepam</td>
<td>5mg PO/IV (PO preferred) QH x 3</td>
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<td>10 mg IV or 20 mg PO Q 30 minutes x 2</td>
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<td>If using Lorazepam</td>
<td>1mg IV or 2mg PO/IM QH x 3</td>
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<td>4mg IV/IM Q 30 x 2</td>
<td>6mg IV/IM x 1</td>
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CIWA-Ar Reassessment Interval after Intervention

| N/A | Reassess 1 hour after each dose; if CIWA-Ar 8-10 after 3rd dose, notify provider and go to level B | Reassess 1 hour after each dose; if CIWA-Ar 11-14 after 3rd dose, notify provider and go to level C | Reassess 30 minutes after each dose; if CIWA-Ar 15-18 after 2nd dose, notify provider and go to level D | Continuous assessment |

CIWA-Ar Score after Intervention

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References

https://doi.org/10.1080/00952990.2017.1362418


https://doi.org/10.4103/0972-6748.132914

https://doi.org/10.1016/j.cc.2017.03.012

https://doi.org/10.1093/alcalc/agv043


https://doi.org/10.1097/PRA.00000000000000229


https://doi.org/10.1002/14651858.CD008358.pub2.

Appendix L

Two-Sided Educational Flyer

Attention Physicians, Residents, APRNs, PAs & RNs

Change in Nursing Practice for Assessment of Alcohol Withdrawal Syndrome

When: On July 16, 2018

What: The medical/telemetry units (4 East, 5 East, and 7 East) will participate in a quality improvement project to improve the assessment of patients at risk for complicated alcohol withdrawal syndrome.

How: Nurses will use the evidenced based Prediction of Alcohol Withdrawal Severity Scale (PAWSS) in the nursing admission assessment in Meditech.

Why: The current assessment tool, CAGE questionnaire, has no predictive ability and is less valid and reliable than the PAWSS tool.

Patients who score ≥ 4 are at risk for complicated alcohol syndrome.

<table>
<thead>
<tr>
<th>CAGE Assessment</th>
<th>PAWSS Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Four question assessment</td>
<td>• 10 question assessment</td>
</tr>
<tr>
<td>• Identifies alcohol abuse and dependence but has no predictive ability</td>
<td>• Identifies alcohol abuse and risk for complicated alcohol withdrawal syndrome</td>
</tr>
<tr>
<td>• Sensitivity 71% and specificity 90%</td>
<td>• Sensitivity 93.1% and specificity 99.5%</td>
</tr>
</tbody>
</table>

PAWSS tool and references on back page
Prediction of Alcohol Withdrawal Severity Scale (PAWSS)  
Maldonado et al., 2014

**Part A: Threshold Criteria:**
1. Have you consumed any amount of alcohol (i.e., been drinking) within the last 30 days? OR did the patient have a “+” BAL upon admission?

*IF the answer to either is YES, proceed with test:*

**Part B: Based on patient interview:**
2. Have you ever experienced previous episodes of alcohol withdrawal?
3. Have you ever experienced alcohol withdrawal seizures?
4. Have you ever experienced delirium tremens or DT’s?
5. Have you ever undergone alcohol rehabilitation treatment?
   (i.e., in-patient or out-patient treatment programs or AA attendance)
6. Have you ever experienced blackouts?
7. Have you combined alcohol with other “downers” like benzodiazepines or barbiturates during the last 90 days?
8. Have you combined alcohol with any other substance of abuse during the last 90 days?

**Part C: Based on clinical evidence:**
9. Was the patient’s blood alcohol level (BAL) on presentation > 200? (e.g., HR > 120 bpm, tremor, sweating, agitation, nausea)

**Total Score:**

*Notes: Maximum score = 10. This instrument is intended as a SCREENING TOOL. The greater the number of positive findings, the higher the risk for the development of alcohol withdrawal syndromes. A score of ≥ 4 suggests HIGH RISK for moderate to severe AWS; prophylaxis and/or treatment may be indicated.*


Appendix M

Budget DNP Scholarly Project

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart audit</td>
<td>150</td>
<td>$55</td>
<td>$8,250 (salaried)</td>
</tr>
<tr>
<td>Data entry into SPSS</td>
<td>4</td>
<td>$55</td>
<td>$220 (salaried)</td>
</tr>
<tr>
<td>Create charts and reports</td>
<td>20</td>
<td>$55</td>
<td>$1,100 (salaried)</td>
</tr>
<tr>
<td>Task group meetings (three meetings during project period)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNP scholar</td>
<td>3</td>
<td>55</td>
<td>$165 (salaried)</td>
</tr>
<tr>
<td>Two registered nurses</td>
<td>3</td>
<td>2 x $30 = $60</td>
<td>$180</td>
</tr>
<tr>
<td>Two nurse managers</td>
<td>3</td>
<td>2 x $40 = $80</td>
<td>$240 (salaried)</td>
</tr>
<tr>
<td>One resident</td>
<td>3</td>
<td>$40</td>
<td>$120 (salaried)</td>
</tr>
<tr>
<td>One hospitalist</td>
<td>3</td>
<td>$100</td>
<td>$300 (salaried)</td>
</tr>
<tr>
<td>One nurse educator</td>
<td>3</td>
<td>$45</td>
<td>$135 (salaried)</td>
</tr>
<tr>
<td>One pharmacist</td>
<td>3</td>
<td>$70</td>
<td>$210 (salaried)</td>
</tr>
<tr>
<td>One nurse practitioner</td>
<td>3</td>
<td>$65</td>
<td>$195 (salaried)</td>
</tr>
<tr>
<td>Supplies and Marketing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office Supplies</td>
<td>0</td>
<td></td>
<td>$75</td>
</tr>
<tr>
<td>Candy/Balloons</td>
<td>0</td>
<td></td>
<td>$125</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$11,315</td>
</tr>
</tbody>
</table>
Appendix N

Results: Post Implementation Nurse Driven Protocol

<table>
<thead>
<tr>
<th></th>
<th>Baseline Data</th>
<th>Post Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$p = 0.46$ (Chi-Square)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>48.72</td>
<td>53.64</td>
</tr>
<tr>
<td>$p = 0.208$ ($t$ test)</td>
<td>$(n = 47)$</td>
<td>$(n = 22)$</td>
</tr>
<tr>
<td>Admission to CAGE/PAWSS</td>
<td>107.88</td>
<td>71.36</td>
</tr>
<tr>
<td>(minutes)</td>
<td>$(n = 42)$</td>
<td>$(n = 22)$</td>
</tr>
<tr>
<td>$p = 0.087$ ($t$ test)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of Stay</td>
<td>7.11</td>
<td>4.0</td>
</tr>
<tr>
<td>$p = 0.037$ (non-parametric)</td>
<td>3.23</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>$(n = 46)$</td>
<td>$(n = 22)$</td>
</tr>
<tr>
<td>Admission to Order Set</td>
<td>230.05</td>
<td>58</td>
</tr>
<tr>
<td>(minutes)</td>
<td>$(n = 42)$</td>
<td>$(n = 9)$</td>
</tr>
<tr>
<td>$p = 0.015$ (non-parametric)</td>
<td>124</td>
<td>50</td>
</tr>
<tr>
<td>Admission to CIWA-Ar</td>
<td>243.32</td>
<td>88.67</td>
</tr>
<tr>
<td>Assessment (minutes)</td>
<td>$(n = 47)$</td>
<td>$(n = 18)$</td>
</tr>
<tr>
<td>$p = 0.011$ (non-parametric)</td>
<td>159</td>
<td>64.5</td>
</tr>
</tbody>
</table>