IntNSA International Nurses Society on Addictions
Original Article
Journal of Addictions Nursing • Volume 35 • Number 3, 122–131 • Copyright © 2024 International Nurses Society on Addictions

2.5 ANCC Contact Hours NCPD

Implementing an Updated Alcohol Withdrawal Symptom Management Order Set Focused on Patient Safety

Meghan Lorbiecki, MSN, RN, CNL, PMH-BC ❍ Alexander Gidal, PharmD ❍ Mary Hagle, PhD, RN, NPD-BC, FAAN ❍ Tina Smith, MS, BSN, NPD-BC, CHSE ❍ Kelly Ragen-Pease, ADN, RN, PMH-BC ❍ Kyle Peterson, MSN, RN ❍ Michael Matye, DNP, RN, PMHNP-BC ❍ Mary-Anne Kowol, MD ❍ Elise Lampe, MD

Abstract

Background: Patients experiencing alcohol withdrawal often receive care on inpatient mental health units. Registered nurses on one such unit had several concerns and questions about the existing alcohol withdrawal symptom management order set. To address these issues, a multidisciplinary team including nurses, psychiatrists, and pharmacists was formed.

Objectives: The aims for this project were to review and revise the existing order set, educate staff, implement the changes, and evaluate outcomes.

Methods: The Plan–Do–Study–Act quality improvement framework guided the project. Five phases were completed to revise the order set and implement: a survey of nurses on the unit, community practice evaluation, and order set revisions. A simulation escape room facilitated nursing education. Patient records were reviewed to identify adverse events.

Results: Diazepam replaced lorazepam as the primary medication choice, and a front-loading protocol was added. Order set clarity was improved, education increased nursing staff confidence to competently complete a patient assessment with the Clinical Institute Withdrawal Assessment Alcohol Scale Revised, and no adverse patient events occurred after implementation.

Conclusion: A revised order set for symptom management of patients experiencing alcohol withdrawal reflected up-to-date evidence while maintaining patient safety. All nurses agreed the revised order set was clear and easy to follow; pharmacists and physicians were satisfied with the revisions. Implications for leaders include having a multidisciplinary team, sufficient resources to answer clinical questions, and regular discussions by all involved disciplines to review any adverse events as well as newly published evidence. Close monitoring of patients early in implementation is recommended to detect adverse events.

Keywords: Alcohol Withdrawal Management, Alcoholism, Benzodiazepines, CIWA-Ar, Escape Room, Inpatients, Mental Health, Simulation Training

INTRODUCTION

Patients experiencing alcohol withdrawal are often admitted for treatment on inpatient mental health (MH) units. A policy and order set (protocol) with pharmacologic and nonpharmacologic interventions were in place for an inpatient MH unit. However, the order set had not been reviewed for several years. There was a lack of clarity in the order set, such as the necessity for certain laboratory tests, which led to frequent questions by nursing staff. Additionally, some registered nurses (RNs) were interested in exploring other medication options, such as including diazepam and ibuprofen.

These and other concerns may impact RNs from effectively caring for their patients. To address these issues, a multidisciplinary team was formed including RNs, psychiatrists, and pharmacists; a survey of all RNs on the unit was completed; community practices were evaluated; and clinical questions were answered. Based on this work, the policy and order set were revised and then implemented. The purpose of this paper was to highlight the changes made in the order set, share a novel education strategy for implementation, and demonstrate the success of this project for both patients and clinicians.

Aims

The initial aims were to assemble a multidisciplinary team, review and revise the existing order set, and evaluate patient and

Meghan Lorbiecki, MSN, RN, CNL, PMH-BC, Mary Hagle, PhD, RN, NPD-BC, FAAN, Tina Smith, MS, BSN, NPD-BC, CHSE, Kelly Ragen-Pease, ADN, RN, PMH-BC, Kyle Peterson, MSN, RN, Michael Matye, DNP, RN, PMHNP-BC, and Elise Lampe, MD, Clement J. Zablocki VA Medical Center, Milwaukee, Wisconsin.

Alexander Gidal, PharmD, Tomah VA Medical Center, Wisconsin.

Mary-Anne Kowol, MD, Jack C. Montgomery VA Medical Center, Muskogee, Oklahoma.

The contents do not represent the views of the U.S. Department of Veterans Affairs or the United States Government.

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

Correspondence related to content to: Meghan Lorbiecki, MSN, RN, CNL, PMH-BC, Clement J. Zablocki VA Medical Center, 5000 W. National Ave., Milwaukee, WI 53295.

E-mail: meghan.lorbiecki@va.gov

DOI: 10.1097/JAN.0000000000000584

nurse outcomes. A second aim was created for implementation: All inpatient MH RNs would competently and confidently assess patients using the Clinical Institute Withdrawal Assessment Alcohol Scale Revised (CIWA-Ar) (Sullivan et al., 1989) and individualize the order set for patients with alcohol withdrawal symptoms to facilitate safe symptom management.

METHODS

Project Design

The Plan–Do–Study–Act (PDSA) quality improvement (QI) framework guided the project. A multiphase process was used to revise the order set and policy, provide education, and implement the changes.

Setting

The project was completed on an inpatient MH unit in a midwestern United States, federal, academic medical center. The secure, inpatient MH unit is composed of 34 beds. Acute care services are provided for adult veterans living with one or several of the following psychiatric conditions: suicidality, mood disorders, psychotic disorders, personality disorders, substance use disorders, trauma disorders, and neurocognitive disorders such as dementia. Treatment programming provides a safe environment that encourages patient participation in individual and group activities. Patients are cared for by a collaborative multidisciplinary group of psychiatrists, psychologists, pharmacists, social workers, and occupational and music therapists as well as RNs.

Team/Stakeholders

An initial workgroup of a small number of MH RNs from the inpatient unit identified 29 questions related to the existing alcohol withdrawal order set. The team consulted the MH clinical nurse leader (CNL) whose analysis revealed that the order set required revision and answers were needed for RNs' clinical questions.

The MH CNL formed a multidisciplinary team including a nurse scientist, a pharmacy resident, a psychiatrist, and three MH RNs. First, the CNL recruited a nurse scientist because she was part of the initial team who developed the original order set several years prior and could advise on processes for revision and approval. Of the small group of MH RNs who developed the 29 questions, three volunteered to be a part of the QI team. Involving staff RNs early in the process helped uncover additional issues and obtain buy-from from staff. The MH pharmacy resident became an integral member for reviewing medications and answering questions. Lastly, it was important to have a psychiatrist on the team for medical insight and provider perspective. The psychiatrist on the team had experience treating alcohol withdrawal in both the outpatient and inpatient settings and was board certified in addiction by the American Board of Psychiatry and Neurology as well as the American Board of Prevention Medicine. Additional psychiatrists and expert MH RNs were consulted as needed. Stakeholders included the unit's collaborative group of clinicians and patients admitted for alcohol withdrawal symptom management.

PROCEDURE

This QI project had five phases generally following the PDSA model. Plan: (1) Understand RN questions and issues about the existing order set, CIWA-Ar assessment, and documentation; Do: (2) revise order set to address questions and issues and then obtain approvals; (3) revise document templates in the electronic health record (EHR); (4) communicate with the MH staff about order set changes and educate RNs with an innovative education strategy for CIWA-Ar assessment; and (5) implement revised order set, monitor patients for adverse events, and audit EHRs preimplementation/postimplementation.

Study: Three areas of evaluation were planned. The first area was RN satisfaction with the order set through a five-question "Voice of the Customer" (VOC) survey prior to beginning the project and 6 weeks after implementation of the order set. The second area was RN education, which addressed their confidence and competence in completing a patient assessment and using the revised order set. An unplanned analysis was the return on investment for the education. Last, two parts of patient evaluation were conducted: (a) The first five patients who had orders using the revised order set were monitored for the occurrence of specific adverse events, and (b) after the first month of implementation, patients' EHRs were reviewed to identify adverse events related to the revised order set and the use of adjunct medications; an identical patient EHR review was conducted for the same month in the year prior to the COVID-19 pandemic. These evaluation findings are reported in the Results section.

The institutional review board reviewed the QI project plan and determined it an operations activity and did not meet the definition of research.

Phase 1

The first phase involved understanding RNs' questions and concerns about current practice. The initial nursing workgroup had several meetings resulting in a list of 29 questions that focused on several areas: medications, the need for certain lab work, and when to discontinue symptom monitoring.

Some RNs had previous experiences using different medications such as diazepam and chlordiazepoxide; they were questioning why these drugs were not part of the order set. These RNs had also used front-loading and inquired if it could be made available. RNs wondered whether acetaminophen or ibuprofen was preferred for pain. There was also a question about the need to measure blood alcohol level. Lastly, the original order set had guidelines to discontinue patient monitoring for withdrawal symptoms after 48 consecutive hours of no medication administration. RNs were questioning if that was best practice and voiced concerns over some RNs having hesitation with giving medication if the patient was close to that 48-hour mark. These and other issues were addressed in Phase 2.

Because the initial workgroup was small, a VOC survey was conducted among all inpatient MH RNs to assess additional areas of concern within the order set. The anonymous, five-question electronic survey was completed by 70% ($n = 37$) of MH RNs employed at that time.

Of the RNs who responded, almost every RN had cared for a patient with alcohol withdrawal symptoms in the past 2 weeks. Only half of the RNs (50%, $n = 37$) felt the order set was clear, and 42% ($n = 37$) felt it was easy to follow. Most RNs (77%, $n = 37$) responded that the EHR documentation met their needs and was efficient. Comments from the VOC revealed two main issues and echoed concerns identified by the initial RN workgroup: (a) All staff needed to be consistent in CIWA-Ar monitoring, and (b) additional adjunct medications needed to be considered. Based on these results, improvement was indicated.

Phase 2

In Phase 2, the focus was on reviewing and revising the order set and the policy as well as obtaining approvals. At the time of the team's work, patient alcohol withdrawal symptom assessment was guided by the CIWA-Ar. No other tools were found in the literature that had a sufficient body of evidence to justify changing to a different assessment tool. Thus, there were no plans to change our assessment scale.

Community Practice Survey The multidisciplinary team reviewed every item on the order set and identified questions or possible changes for evaluation. A community practice survey was conducted. Local hospitals and hospitals within the federal system were asked for their policies and order sets for alcohol withdrawal symptom management to establish community practice. These order sets were compared with the existing order set at the authors' institution.

Pharmacologic Management Pharmacologic management is best practice for hospitalized patients with moderate-to-severe alcohol withdrawal. Benzodiazepines are an integral part of treatment protocols (American Society of Addiction Medicine [ASAM], 2020; Department of Veterans Affairs and Department of Defense, 2021) as they reliably prevent progression to seizures and delirium tremens. This is due to their activity at the $GABA_A$ receptor, which closely simulates the effects of alcohol in the central nervous system (ASAM, 2020). During alcohol withdrawal, the significant downregulation in the central nervous system can lead to rapid and uncompensated loss of inhibitory activity within the central nervous system resulting in sequelae such as tremor, diaphoresis, tachycardia, and hypertension. In severe cases, this can result in cardiovascular instability or seizures, which can be life-threatening (Kosten & O'Connor, 2003). Benzodiazepines stimulate inhibitory activity in a manner similar to alcohol; thus, they can be used to reduce or prevent these sequelae. Although the use of benzodiazepines is standard practice, specific protocols for indication, dose, and timing vary from institution to institution (ASAM, 2020).

Additionally, adjunctive treatments are regularly used for various alcohol withdrawal symptoms. Gabapentin is an anticonvulsant that has been used as an off-label treatment or adjunct for alcohol withdrawal. Although current evidence does not support its use to prevent seizures in alcohol withdrawal, it has been used to successfully reduce symptoms in mild-to-moderate cases of alcohol withdrawal (Ghosh et al., 2021). Gabapentin is also a useful adjunct to benzodiazepines to treat breakthrough symptoms such as anxiety or insomnia (ASAM, 2020; Bates et al., 2020; Maldonado, 2017; Wilming et al., 2018). Gabapentin has the advantage of being an off-label option to treat alcohol use disorder and can be initiated during alcohol withdrawal for this indication (Department of Veterans Affairs and Department of Defense, 2021; Leung et al., 2015). Gabapentin is often well tolerated in older adults and has no hepatic metabolism; however, it does require dose adjustment in renal impairment (Reus et al., 2018).

Order Set Changes The MH pharmacy resident recommended several changes: adding a front-loading regimen, making diazepam the primary therapeutic benzodiazepine, and including gabapentin as an adjunct medication. However, order set revisions included both diazepam and lorazepam, with specific criteria to guide providers when each should be used.

Prior to the order set revision, lorazepam was used as the benzodiazepine of choice for alcohol withdrawal. Lorazepam has several advantages for its use, most notably that its metabolism is often preserved in impaired hepatic metabolism and in older adults (Ativan, 2021). Further, lorazepam has an intermediate duration of action, which reduces the risk of accidental overdose while still providing adequate symptom control (Long et al., 2017). However, lorazepam has some disadvantages. It has a relatively long onset of action, up to 30 minutes when given orally. Its intermediate duration of action can often necessitate more frequent dosing, especially in more severe alcohol withdrawal with the increased risk of return of symptoms due to its shorter half-life (Long et al., 2017).

Diazepam, on the other hand, has a rapid onset of action (~5–10 minutes orally) and a long duration of action (Long et al., 2017). Thus, diazepam was selected as primary therapy for alcohol withdrawal symptom management. Longer-acting benzodiazepines such as diazepam can also be used in front-loading protocols where predetermined and moderate to high doses are given to patients who are at risk for severe alcohol withdrawal (ASAM, 2020). This initial larger dose provides significant relief of symptoms. Front-loading protocols have been shown to reduce the overall quantity of benzodiazepines required during the hospital stay and can remove some of the subjectivity in dosing during alcohol withdrawal (ASAM, 2020).

Diazepam has some important clinical considerations. Specifically, the risk of drug interactions means that diazepam should not be used in patients taking medications that increase its metabolism, which may reduce its efficacy (Valium, 2021). Intramuscular diazepam is not recommended due to erratic absorption and slow time to peak drug levels (Leppik & Patel, 2015; Wichliński et al., 1985). Finally, the extensive hepatic metabolism of diazepam makes it

dangerous to use in patients with poor liver function (Long et al., 2017).

Thiamine is another critical element in all alcohol withdrawal protocols as chronic alcohol use impairs absorption of thiamine from the gastrointestinal tract. Dangerous neurological conditions such as Wernicke encephalopathy, an acute illness, and Korsakoff syndrome, a chronic condition, can result from thiamine deficiency (ASAM, 2020). After team discussion, thiamine dosing and administration were revised for patients at risk. For the prevention of Wernicke encephalopathy for patients at risk, recommended orders are thiamine 100 mg IM daily × 3 days, then 100 mg PO TID × 7 days, and then 100 mg PO daily indefinitely.

Additional adjunct medications were also considered. The initial nursing workgroup questioned whether acetaminophen or ibuprofen was preferred for pain. After pharmacist and psychiatrist review, ibuprofen was not added to the order set to avoid cardiovascular and renal complications. Acetaminophen orders were kept at 650 mg PO every 6 hours PRN for pain.

Another of the RNs' questions involved the CIWA-Ar score and at what point medication was indicated. The evidence from the literature and community practice was summarized and discussed with the team. No changes were made by the psychiatrists to the scoring parameters for symptom management (see Table 1).

Other questions from the initial nursing workgroup were addressed, and order set revisions were made based on consultations with additional MH pharmacists and psychiatrists. Additionally, the order set was streamlined, language was revised for clarity, and inconsistencies were corrected. All disciplines reviewed the final document, and the psychiatry team approved.

Phase 3

Having an approved order set, Phase 3 focused on updating documentation templates in the EHR. The multidisciplinary team collaborated with pharmacy, informatics, medical records, and psychiatry to make the necessary changes. One concern was the potential for medication errors that could be introduced by the inclusion of multiple benzodiazepines and dosing options in the CIWA-Ar order set. The order template was adjusted to provide clinical decision support to admitting physicians in selecting appropriate medications to address these concerns. For example, bulleted dialogs identified the clinical indications for selecting lorazepam rather than diazepam, such as age and liver dysfunction. Additionally, the selection of the benzodiazepine to be used was separate from other medication options so physicians could focus on this choice before considering other elements of care. A similar dialog prompt was created for the addition of gabapentin and the selection of intramuscular or oral thiamine to facilitate protocol adherent medication ordering.

A separate menu option was created in the EHR for the front-loading protocol, which explains why this option would be clinically appropriate. The menu details the front-loading regimen and outlines what selecting this menu option would include as well as how to select between different dosing options.

Changes to the nursing documentation template made it easier to document adjunctive medications that were administered. A new documentation template was added for nonpharmacologic measures, such as low lighting, noise reduction, emotional support, fluids and nutrition, and sleep promotion. Both the order set and nursing documentation template were piloted on EHR test patients by RN staff and psychiatrists for critical review prior to go-live.

TABLE 1 CIWA-Ar Scoring Parameters for Managing Alcohol Withdrawal Symptoms

CIWA-Ar Scoring Parameters for Revised Order Set at Authors' Medical Center (No Change From Existing Order Set)	
0–7: At risk 8–10: Mild risk 11–15: Moderate risk ≥16: Severe risk	
CIWA-Ar Scoring Parameters From Literature	**Source**
<10: Very mild 10–18: Moderate ≥19: Severe withdrawal or complicated	American Society of Addiction Medicine (2020)
<10: Very mild 10–15: Mild 16–20: Moderate >20: Severe withdrawal	Hoffman & Weinhouse (2021)
≤15: Mild 16–20: Moderate >20: Severe withdrawal	Maldonado (2017)
CIWA-Ar Scoring Parameters of Community Practice	**Source**
<8: Do not treat 8–10: Treat 11–15: Treat 16–20: Treat >20: Treat and call physician	A
<8: Do not treat 8–14: Treat ≥15: Treat	B
0–8: Do not treat 9–15:Treat and consider need for progressive care unit 16+: Treat and consider need for intensive care unit	C
0–7: Do not treat ≥8: Treat	D

Abbreviation: CIWA-Ar = Clinical Institute Withdrawal Assessment Alcohol Scale Revised.

Phase 4

This phase entailed communication and education. All RNs received communication about the approved, revised order set and monitoring changes. Communication was done using three different tactics: meeting announcements, emails, and 1:1 in-person contact for multiple messaging to staff and providers. Prior to RN education, the CNL conducted an educational needs assessment and identified only one tutorial about alcohol withdrawal available online. The facility-approved online procedure book had one section that included information about CIWA-Ar. Additionally, MH leadership and the CNL noticed inconsistencies among RNs in CIWA-Ar scoring, which may have resulted in variances of medication doses.

Thus, the CNL led the education initiative to design an engaging curriculum that would change clinical practice. Together with the simulation program manager, a simulation escape room was adopted as the educational method where the learner completes several tasks and can "escape" from the room (Gates & Youngberg-Campos, 2020). This method was identified based on the goal of increasing RNs' confidence and competence in formulating a CIWA-Ar score and RNs' ability to apply the revised order set. An escape room would engage learners, replicate the MH clinical setting, allow for clinical immersion as well as physical and conceptual fidelity, and provide a safe learning environment (INACSL Standards Committee, 2016b). Learning objectives for *Capture CIWA-Ar: Managing Alcohol Withdrawal Symptoms Escape Room* included the following:

1. Compose a CIWA-Ar assessment score for the MH patient from subjective and objective data collection.
2. Apply the revised order set for both symptom-triggered and front-loading dosing.
3. Administer medications, including benzodiazepines and PRNs, per the order set.
4. Problem solve and communicate effectively as a team.

The escape room included standardized patients to increase the realism of the simulation, as well as assured consistency and conceptual fidelity (INACSL Standards Committee, 2016b). Two unique standardized patients showcased the features of the revised order set and provided for an emphasis on nursing assessment. The standardized patients followed a script for each patient experience while interacting with the learners. With Patient 1 (Glenda), RNs independently composed CIWA-Ar scores, compared their assessments, and applied interventions. The aim was to determine which benzodiazepine was appropriate based on the clinical assessment, what new medications were available in the order set, and what nonpharmacologic interventions could be used. For Patient 2 (Glen), RNs composed CIWA-Ar scores and determined interventions as a team. This part focused on the new front-loading regimen, laboratory monitoring, and situations when the provider was to be notified. The standardized scripts provided patient dialog, CIWA-Ar element symptoms, and visual cues. Using a mixture of nursing staff from different departments and different methods, the escape room was successfully piloted four times.

All inpatient MH RNs participated as learners. Teams of two to three RN learners completed 12 clues and puzzles in order to "escape." The average escape room was 45 minutes in length, and the debriefing lasted 15–25 minutes (INACSL Standards Committee, 2016b). The simulation faculty used the gather, analyze, and summarize debriefing method (Sawyer et al., 2016). The faculty acknowledged that all learners are intelligent, well-trained clinicians who care about doing their best and want to improve their practice (INACSL Standards Committee, 2016a, 2016b). Debriefing provided the learners an opportunity to discuss, compare, reason critically, and reflect on their decision making openly and honestly. There were 17 courses offered over 3 days covering all shifts; leadership at the unit level provided patient coverage to ensure all MH RNs could participate. An example of the escape room activity for Patient 1 is outlined in Figure 1.

Phase 5

The last phase was implementation of the revised order set. Highlights of the changes were distributed to both inpatient and outpatient psychiatrists, hospitalists, pharmacists, and psychiatry residents. When education was completed, resources were available and provided to all disciplines, and a start date was identified in collaboration with leadership. The first five patients who were managed with the new order set were monitored for possible adverse events of oversedation, respiratory depression, or seizure (ASAM, 2020). No adverse events were reported.

RESULTS

Revised Order Set

Although CIWA-Ar was kept as the approved assessment tool, other changes were made. These included having diazepam as primary therapy, adding front-loading as a treatment option for patients at risk for severe alcohol withdrawal syndrome, adding gabapentin as an adjunct medication, revising lab orders, and updating provider notification based on total benzodiazepine dosage (see Figure 2).

RNs were surveyed 6 weeks after implementation regarding the order set and documentation changes. Just as in the previous VOC, the survey had a 2-week response period; 59% ($n = 41$) of RNs employed at that time participated. All RNs who completed the survey believed that the order set was more understandable (up from 50%) and easy to follow (up from 42%). All staff felt they could use the revised order set. The documentation template improved as well, with 100% of RNs ($N = 41$) believing it met their needs and was efficient, an increase from 77% prerevision.

RN Education

After experiencing the escape room and debriefing, staff confidence and competence in completing a patient assessment with CIWA-Ar and using the new alcohol withdrawal

1. The team received a two-patient assignment with both patients experiencing alcohol withdrawal. The team determined who was the appropriate patient to assess first.
2. The team assessed Patient 1 together, but independently decided on a CIWA-Ar score.
3. The team then solved a puzzle alphabet code that asked them what benzodiazepine was appropriate for Patient 1 based on clinical presentation, demographics, and home medication.
4. Non-pharmacologic interventions can help relieve symptoms during withdrawal, so the team was asked to find and identify five comfort measures, such as hydration, aromatherapy, and dimmed lights.
5. A CIWA-Ar Medication Crossword Puzzle gave the team a code word key. The key unlocked a box directing them that it was time to complete a CIWA-Ar assessment on Patient 2.

Figure 1. Overview of escape room plan for learners using Standardized Patient 1.

symptom management order set increased on average from 2.7 to 4.1 (0–5 Likert scale), with 76% of RNs ($n = 45$) having good or very good confidence (see Figure 3). During debriefing, learners were able to see how the categories of anxiety and agitation can be easily interchanged; using the flowsheet prevented this error. Learners also noticed that nausea/vomiting, tremor, sweating, anxiety, and agitation categories were more subjective, which could cause difficulties in scoring reliably. One of the key takeaways was realizing the importance of using the flowsheet to obtain an accurate CIWA-Ar score.

Immediately after completing the debriefing, RNs were asked to complete an evaluation of their overall experience with the escape room. Most RNs (97%, $n = 35$) felt the escape room was a helpful way to learn about changes to the CIWA-Ar order set. When asked if they could apply the revised order set to monitor patients with both symptom-triggered dosing and the front-loading regimen, 51% ($n = 35$) strongly agreed, whereas the remaining RNs agreed. Many RNs (60%, $n = 35$) strongly agreed, and the remaining RNs agreed, they could compose a CIWA-Ar assessment score for their patient from subjective and objective data. Comments from the evaluation included "I like the escape room concept since it is a hands-on training, it retains more in your memory than just reading the new protocol. I also like the debriefing afterwards," "I absolutely loved participating in the escape room. It was fun, knowledgeable and an excellent display of teamwork," and "I loved the escape room! It was fun and helped aid in learning the new material."

The cost of the education initiative was also calculated. From initial planning to delivery of the simulation escape room, the cost was $10,982 for 45 MH RNs over 17 sessions. This was calculated using the average RN salary including benefits from August 2021 ($55/hour). Costs for development and delivery of this education were as follows:

- Creating the education: $55/hour × 24 hours × 3 people = $3,960
- Pilots: 1 hour ($55/hour) × 19 individuals = $1,045
- Delivering each education session: 1.5 hours ($55/hour) × 2.5 staff (1.5 faculty and 1 patient actor) = $206 (× 17 sessions) = $3,502
- RN learners: each session was 1 hour ($55/hour) × 45 MH RNs = $2,475

Putting this cost into perspective, having accurate symptom assessments using the CIWA-Ar scale enables appropriate medication dosing and identifies the risk level. If the average cost of a patient admission to an inpatient MH facility is $9,879 and the need arises to transfer a patient to a higher level of care, the average cost of admission to an inpatient medical unit is $19,672. The difference in cost is $9,793. Thus, with accurate assessments and pharmacologic management, a patient transfer and resultant cost ($9,793) may be avoided. This potential cost avoidance nearly equals the cost of the simulation education.

Patient Evaluation

The first five patients after implementation were monitored closely; no adverse events were reported. The CNL reviewed EHR documentation preimplementation/postimplementation of the revised order set. This audit was performed to identify any unintended consequences or changes in patient

1. If positive alcohol screen, potential for alcohol withdrawal exists, or per nursing judgment, initiate assessment using Clinical Institute Withdrawal Assessment – Alcohol revised (CIWA- Ar)
2. **Monitoring / Pharmacologic management using Symptom Triggered dosing:**
    a. Perform CIWA-Ar assessment every 2 hours for 12 hours from admission while awake.
    b. After initial 12 hours, perform CIWA-Ar assessment every 4 hours and PRN while awake.
    c. If benzodiazepines are administered, reassess 1 hour after benzodiazepines using the CIWA-Ar.
    d. CIWA-Ar assessments are discontinued by the LIP once clinically indicated.
    e. Orders for alcohol withdrawal symptom management expire after 5 days and must be renewed.

CIWA-Ar total score / Risk level	Diazepam (Valium®)*	Reassessment time post benzodiazepine
0 – 7 AT RISK	No benzodiazepine	N/A
8 – 10 MILD	5 mg PO	Reassess in 1 hr after benzodiazepine
11 – 15 MODERATE	10 mg PO	Reassess in 1 hr after benzodiazepine
16 or greater SEVERE	15 mg PO	Reassess in 1 hr after benzodiazepine

* While no particular benzodiazepine agent is more effective than another, longer-acting benzodiazepines are the preferred agents due to clinical benefits of their longer duration of action.

CIWA-Ar total score / Risk level	Lorazepam (Ativan®) **	Reassessment time post benzodiazepine
0 – 7 AT RISK	No benzodiazepine	N/A
8 – 10 MILD	1 mg PO or IM	Reassess in 1 hr after benzodiazepine
11 – 15 MODERATE	2 mg PO or IM	Reassess in 1 hr after benzodiazepine
16 or greater SEVERE	3 mg PO or IM	Reassess in 1 hr after benzodiazepine

**Use lorazepam for patients with laboratory or symptomatic evidence of impaired hepatic function (e.g. Child-Pugh score of C, elevated LFTs greater than 3 times the upper limit of normal, severe chronic hepatic illness), NPO status, on Cytochrome P450 3A4 inducers, or in patients >65 years old. If waiting for lab test results or if tests unavailable, diazepam should still be used first line unless the patient has a past history or other evidence of significant liver disease.

3. **Front loading regimen**: consider initiating if there is a history of withdrawal seizures, DTs, chronic alcoholism, or other risk factors for serious complications from withdrawal such as low potassium (<3.5), frail elderly, underlying CV disease.
    a. **Diazepam** 10 mg PO every 1 hour x 3 doses
        i. In the presence of any of the following: mild to moderate hepatic impairment, age >65, or Cytochrome P450 3A4 *inhibitors*: Diazepam 5 mg PO every 1 hour x 3 doses
    b. In the presence of severe hepatic impairment, NPO status, or Cytochrome P450 3A4 *inducers* front loading should be avoided.
    c. During loading, the patient should have every 1 hour CIWA-Ar assessments including vital signs. In general, the loading is with three doses as long as the patient remains awake. If the patient is asleep prior to completion of the loading, then the subsequent doses should be held. If the patient becomes over-sedated during or after the loading, the physician is contacted for bedside evaluation.
    d. After front loading regimen completed, initiate Symptom Triggered dosing.
        i. After patient receives their last dose of Diazepam, RN performs 1 hour reassessment. After 1 hour reassessment, initiate symptom trigger dosing starting with CIWA-Ar assessment every 2 hours for 12 hours while awake.
4. **Vital signs:** with every CIWA-Ar assessment (BP, HR, RR, temperature, pulse ox)
5. **Notify provider if:**
    a. Two (2) consecutive CIWA-Ar scores of 16 or greater
    b. In the last 24 hours if total dose of:
        i. Diazepam reaches 50 mg
        ii. Lorazepam reaches 10 mg
    c. Over-sedation, respiratory depression (RR <12), hallucinations or seizures.
6. **Labs:** Basic metabolic panel (BMP), serum magnesium (Mg), serum phosphate (PO4) the mornings following admission for 2 days
7. **Adjunctive agents:**

Alcohol Withdrawal Symptom Management Order Set

    a. Haloperidol 2 mg PO or IM every 4 hours PRN for hallucinations uncontrolled by benzodiazepines.
        i. Exercise caution for geriatric patients
        ii. If a previous history of seizures during withdrawal – or seizures during the current hospitalization – patient should not receive haloperidol.
    b. Acetaminophen 650 mg PO every 6 hours PRN for pain
        i. CIWA Acetaminophen order supersedes the admitting Acetaminophen order.
    c. Gabapentin 300 mg PO every 8 hours PRN anxiety based on renal function
    d. Hydralazine 10 mg PO every 6 hours PRN for SBP > 180 or DBP > 100
        i. CIWA Hydralazine order supersedes the admitting Hydralazine order.
8. **Vitamin replacement:**
    a. Thiamine 100 mg PO daily
        i. For prevention of Wernicke's Encephalopathy, for patients at risk, select Thiamine 100 mg IM x 3 days, then 100 mg PO TID x 7 days, then 100 mg PO daily indefinitely.
    b. Folic acid 1 mg PO daily
    c. Therapeutic multivitamin 1 tablet PO daily

Figure 2. Revised order set for alcohol withdrawal symptom management in acute mental health.

outcomes from the revised order set. Patient clinical characteristics, medications ordered and administered, and adverse events for both groups of patients are outlined in Table 2.

The 39 patients admitted with the revised order set in August 2021 were reviewed. Front-loading was ordered for two patients, whereas 36 patients had symptom-triggered therapy ordered. Of the 38 patients who had a benzodiazepine ordered, 46% received a benzodiazepine: 17 patients received diazepam, and one received lorazepam. None of these patients experienced respiratory depression or oversedation. Two patients were at a severe risk of alcohol withdrawal syndrome, having scores of 16 and 19. The patient with a score of 16 received a total of 80-mg diazepam as well as gabapentin over 50 hours. The patient with a score of 19 received a total dose of 20-mg diazepam as well as gabapentin. For the 21 patients who did not receive a benzodiazepine, the highest CIWA-Ar score was 6, at which no benzodiazepine was indicated. However, many of these patients had symptoms, and 57% ($n = 22$) received gabapentin as either a scheduled dose or PRN.

For a similar time period prepandemic and preorder set revision, 56 patients' EHRs were audited for admissions during August 2019. Gender and ages were similar (see Table 2). Lorazepam was ordered for 51 patients, and one patient had scheduled clonazepam, resulting in benzodiazepine orders for 93% of the patients, although only 39% received a benzodiazepine. None of the patients receiving a benzodiazepine experienced respiratory depression or oversedation. Four patients had no benzodiazepines ordered, and their CIWA-Ar scores all indicated "at risk" (0–7) but with no indication for a benzodiazepine per the symptom-triggered order set at that time. The highest CIWA-Ar score was 15 for three patients, putting them at a "moderate risk" (11–15). One of these

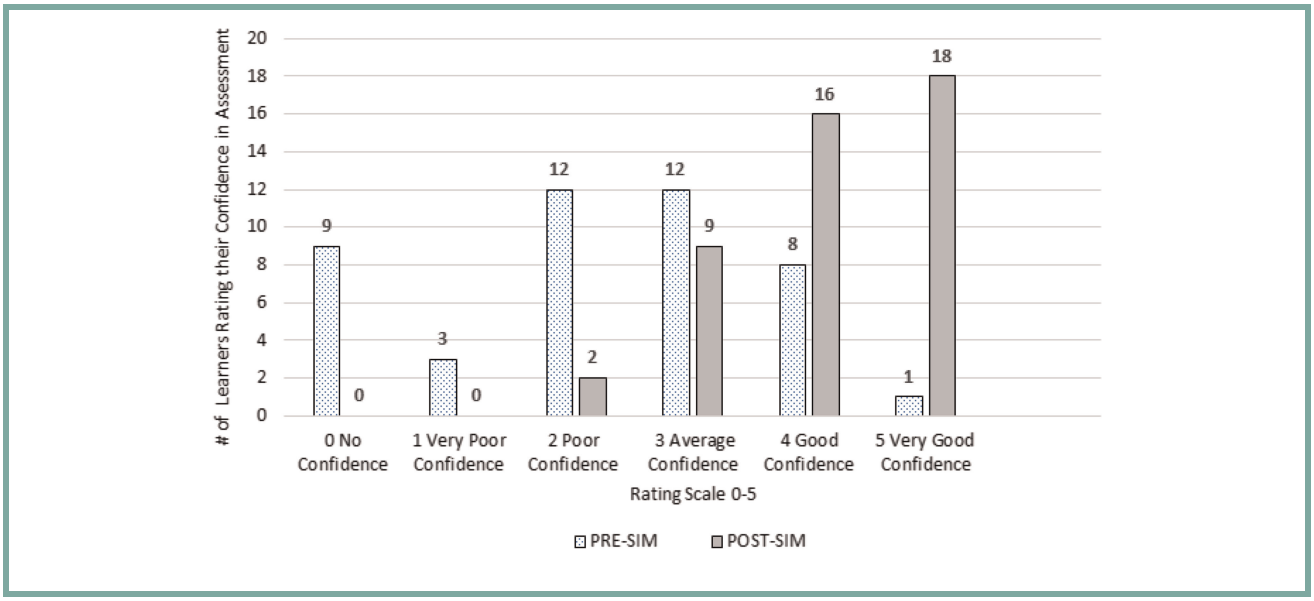

Figure 3. Registered nurses ($N = 45$) expressing confidence and competence with revised alcohol withdrawal symptom management order set: pre/post escape room simulation.

patients had a seizure 12 hours after admission and was transferred to a higher level of care; while on the MH unit, they received 3 mg of lorazepam.

Based on the evaluations, no further changes were made to the revised order set. The last step of this QI project was "Act," that is, decide on whether to adopt, adapt, or abandon the revised order set (Hagle et al., 2020). The team adopted the revised order set; it is now standard treatment for alcohol withdrawal in this MH inpatient setting.

DISCUSSION

The authors' medical center provides a vast array of services, including inpatient MH, to veterans from diverse cultural and socioeconomic backgrounds. Having protocols that are current and RNs knowledgeable in the care of patients with alcohol withdrawal symptoms is crucial when there are almost 308,000 unique patients admitted to Veterans Affairs hospitals needing alcohol withdrawal treatment (Steel et al., 2020). This number represents a national prevalence of

TABLE 2 Patient Clinical Characteristics, Medications Administered, and Adverse Event Occurrences From Electronic Health Record Review

	Prerevision to Existing Order Set Patients Reviewed: 56	Postimplementation Revised Order Set Patients Reviewed: 39
Gender	98% male	95% male
Age (mean and range; years)	54; 31–73	55; 36–75
Highest CIWA-Ar score	15 (moderate risk)	19 (severe risk)
% of patients with benzodiazepine ordered	93%	97% - Diazepam ordered for 31 patients - Lorazepam ordered for 7 patients
% of patients receiving benzodiazepine	39%	46%
For those receiving benzodiazepine, did they experience:		
Respiratory depression?	0	0
Oversedation?	0	0
Seizure?	1	0
Delirium tremens?	0	0
Transferred to higher level of care?	Yes (patient with seizure)	0

Abbreviation: CIWA-Ar = Clinical Institute Withdrawal Assessment Alcohol Scale Revised.

5.8% (range: 1.4%–16.1%) inpatient hospitalizations. Among MH admissions, 19% of the patients experienced alcohol withdrawal (Steel et al., 2020).

Achieving the aims of this project meant that quality care is being delivered: an updated alcohol withdrawal symptom management order set, improved clarity and usage of the order set, and improved RNs' knowledge and skill in alcohol withdrawal symptom assessment. Significant changes in practice were the additions of diazepam as primary treatment, a front-loading option, and an additional adjunct medication, thus supporting individualized patient care.

Personalizing care for the patient also involves implementing nonpharmacologic interventions based on their withdrawal symptoms. The RNs applied this knowledge during the simulation escape room for Patient 1 by dimming the lights; providing a blanket, fluids, nutrition, and emotional support; and offering lavender aromatherapy. Nonpharmacologic and pharmacologic interventions complement each other to alleviate symptoms and provide comfort for the patient.

Continuing PDSA cycles after implementation were essential in making the changes sustainable. The month following go-live, the CNL rounded individually with every RN and provider for feedback or questions concerning the revised order set. The order set was also discussed at length during unit meetings. These interactions provided the CNL with valuable insight into what was going well and what needed to be improved.

Through RN feedback, the team discovered that the RN documentation of the CIWA-Ar assessment needed to be added in another area in the EHR for ease of use. The flowsheet needed to be easily available on paper in addition to EHR for quick reference. The EHR was changed to give providers clear directions when ordering gabapentin and thiamine. The CNL was able to provide immediate feedback to RNs and providers based on real-time auditing of patients treated with the new alcohol withdrawal order set. To make sure all these updates were communicated to everyone, the CNL sent follow-up emails at 2 weeks and 1 month after implementation to provide further education and clarification regarding the new process. These emails were posted throughout the unit as well.

A multidisciplinary team is highly recommended for success. Team members for this project included three direct care RNs, a pharmacist, a psychiatrist, a nurse scientist, and the MH CNL, who were present at all team meetings. Each discipline was able to identify potential areas for improvement and potential difficulties in the original order set. Staff buy-in for the changes was achieved through involvement of all staff from the start of the project. Leadership at all levels of the MH division supported the team and changes. The CNL and the simulation manager continue to brainstorm ways to implement the escape room quarterly for new MH RNs as part of their orientation to ensure consistency and competency. Last, a team similar in makeup to MH but for medical/surgical units was formed to adapt the alcohol withdrawal symptom management order set for those units. Minor modifications were made, and the order set was approved and implemented within the acute care medical/surgical division.

CONCLUSION

A policy and order set for the management of patients experiencing alcohol withdrawal symptoms were updated. No patient adverse events were reported after implementation in the inpatient MH unit. From the VOC survey, 100% of RNs ($N = 45$) found the revised order set to be clear and easy to follow; anecdotally, pharmacists and physicians were satisfied with the revised order set. After 10 months of using the revised order set, no further changes have been needed.

Implications for leaders include the need for having a multidisciplinary team, time, and resources to answer clinical questions, training, and ongoing discussions by all involved disciplines about order set revisions. Close monitoring of patients early in implementation is recommended to detect possible adverse events of sedation, respiratory depression, or seizure.

Acknowledgments: Appreciation is extended to all registered nurses on the inpatient mental health unit, Ed Pelican and James Kotek in pharmacy, and the Mental Health Division leadership.

REFERENCES

American Society of Addiction Medicine (2020). The ASAM clinical practice guideline on alcohol withdrawal management. *Journal of Addiction Medicine*, *14*(3S, Suppl 1), 1–72. 10.1097/ADM.0000000000000668

(2021). *Ativan (lorazepam) injection [Prescribing information]*. Hikma Pharmaceuticals USA.

Bates, R. E., Leung, J. G., Morgan, R. J., 3rd, Fischer, K. M., Philbrick, K. L., & Kung, S. (2020). Retrospective analysis of gabapentin for alcohol withdrawal in the hospital setting: The Mayo Clinic experience. *Mayo Clinic Proceedings. Innovations, Quality & Outcomes*, *4*(5), 542–549.

Department of Veterans Affairs and Department of Defense. (2021). *VA/DoD clinical practice guideline for the management of substance use disorders*. https://www.healthquality.va.gov/guidelines/MH/sud/VADoDSUDCPG.pdf

Gates, J. A., & Youngberg-Campos, M. (2020). Will you escape?: Validating practice while fostering engagement through an escape room. *Journal for Nurses in Professional Development*, *36*(5), 271–276. https://doi.org/10.1097/NND.0000000000000653

Ghosh, A., Mahintamani, T., Choudhury, S., Sharma, N., & Das, S. (2021). The effectiveness of non-benzodiazepine, non-barbiturate medications for alcohol withdrawal syndrome: A rapid systematic review. *Alcohol and Alcoholism (Oxford, Oxfordshire)*, *56*(5), 513–534.

Hagle, M., Dwyer, D., Gettrust, L., Lusk, D., Peterson, K., & Tennies, S. (2020). Development and implementation of a model for research, evidence-based practice, quality improvement, and innovation. *Journal of Nursing Care Quality*, *35*(2), 102–107. 10.1097/NCQ.0000000000000422

Hoffman, R. S., & Weinhouse, G. L. (2021). Management of moderate and severe alcohol withdrawal syndromes. In S. J. Traub (Ed.), *UpToDate*. Wolters Kluwer Health. https://www.uptodate.com/contents/management-of-moderate-and-severe-alcohol-withdrawal-syndromes?search=alcohol%20withdrawal&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1

INACSL Standards Committee (2016a). INACSL standards of best practice: Simulation[SM] debriefing. *Clinical Simulation in Nursing*, *12*(S), S21–S25. https://doi.org/10.1016/j.ecns.2016.09.008

INACSL Standards Committee. (2016b). INACSL standards of best practice: Simulation[SM] simulation design. *Clinical Simulation in Nursing*, *12*(S), S5–S12. https://doi.org/10.1016/j.ecns.2016.09.005

Kosten, T. R., & O'Connor, P. G. (2003). Management of drug and alcohol withdrawal. *New England Journal of Medicine*, *348*, 1786–1795.

Leppik, I. E., & Patel, S. I. (2015). Intramuscular and rectal therapies of acute seizures. *Epilepsy & Behavior: E&B*, *49*, 307–312. https://doi.org/10.1016/j.yebeh.2015.05.001

Leung, J. G., Hall-Flavin, D., Nelson, S., Schmidt, K. A., & Schak, K. M. (2015). The role of gabapentin in the management of alcohol withdrawal and dependence. *Annals of Pharmacotherapy*, *49*(8), 897–906.

Long, D., Long, B., & Koyfman, A. (2017). The emergency medicine management of severe alcohol withdrawal. *The American Journal of Emergency Medicine*, *35*(7), 1005–1011. https://doi.org/10.1176/appi.ajp.2017.1750101

Maldonado, J. R. (2017). Novel algorithms for the prophylaxis and management of alcohol withdrawal syndromes—Beyond benzodiazepines. *Critical Care Clinics*, *33*(3), 559–599.

Reus, V. I., Fochtmann, L. J., Bukstein, O., Eyler, A. E., Hilty, D. M., Horvitz-Lennon, M., Mahoney, J., Pasic, J., Weaver, M., Wills, C. D., McIntyre, J., Kidd, J., Yager, J., & Hong, S. H. (2018). The American Psychiatric Association practice guideline for the pharmacological treatment of patients with alcohol use disorder. *American Journal of Psychiatry*, *175*(1), 86–90.

Sawyer, T., Eppich, W., Brett-Fleegler, M., Grant, V., & Cheng, A. (2016). More than one way to debrief: A critical review of healthcare simulation debriefing methods. *Simulation in Healthcare*, *11*(3), 209–217. https://doi.org/10.1097/SIH.0000000000000148

Steel, T. L., Malte, C. A., Bradley, K. A., Lokhandwala, S., Hough, C. L., & Hawkins, E. J. (2020). Prevalence and variation of clinically recognized inpatient alcohol withdrawal syndrome in the Veterans Health Administration. *Journal of Addiction Medicine*, *14*(4), 300–304. https://doi.org/10.1097/ADM.0000000000000576

Sullivan, J. T., Sykora, K., Schneiderman, J., Naranjo, C. A., & Sellers, E. M. (1989). Assessment of alcohol withdrawal: The revised clinical institute withdrawal assessment for alcohol scale (CIWA-Ar). *British Journal of Addiction*, *84*(11), 1353–1357. https://doi.org/10.1111/j.1360-0443.1989.tb00737.x

Valium (diazepam) [Prescribing information]. (2021). Roche Laboratories.

Wichliński, L. M., Mazur, R., Sieradzki, E., Jankowski, A., Dirska, R., & Gosk-Kowalska, T. (1985). Pharmacokinetics of diazepam after intravenous, intramuscular and oral administration to humans. *Polish Journal of Medicine and Pharmacy*, *17*(1), 44–46.

Wilming, C., Alford, M., & Klaus, L. (2018). Gabapentin use in acute alcohol withdrawal management. *Federal Practitioner*, *35*(3), 40–46 https://www.ncbi.nlm.nih.gov/pubmed/30766348

For more than 50 additional continuing education articles related to Addictions topics, go to NursingCenter.com/CE.

Lippincott® NursingCenter®

NCPD Nursing Continuing Professional Development

TEST INSTRUCTIONS

- Read the article. The test for this nursing continuing professional development (NCPD) activity is to be taken online at **www.nursing-center.com/CE/JAN**. Tests can no longer be mailed or faxed.
- You'll need to create an account (it's free!) and log in to access My Planner before taking online tests. Your planner will keep track of all your Lippincott Professional Development online NCPD activities for you.
- There's only one correct answer for each question. A passing score for this test is 8 correct answers. If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact Lippincott Professional Development: 1-800-787-8985.
- Registration deadline is September 5, 2025.

PROVIDER ACCREDITATION

Lippincott Professional Development will award 2.5 contact hours for this nursing continuing professional development activity.

Lippincott Professional Development is accredited as a provider of nursing continuing professional development by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 2.5 contact hours. Lippincott Professional Development is also an approved provider of continuing nursing education by the District of Columbia, Georgia, West Virginia, New Mexico, South Carolina, and Florida, CE Broker #50-1223. Your certificate is valid in all states.

Payment: The registration fee for this test is $24.95. IntNSA members receive a 30% discount on the price of CE in this journal. Go to the "members only" section on the IntNSA website to take advantage of this benefit.

Disclosure Statement: The authors have disclosed off-label use of gabapentin for alcohol withdrawal syndrome and alcohol use disorder is discussed in this article. Please consult the product labeling for approved indications. The authors and planners have disclosed no potential relevant financial relationships or otherwise.