Improving Identification of Admitted Patients at High Risk for Complicated Alcohol Withdrawal Using the Prediction of Alcohol Withdrawal Severity Scale (PAWSS) Tool

Project Lead/Key Contacts

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Why are you interested in participating in the Improvement Scholars Program? Being a DNP prepared nurse practitioner, I have acquired the skills and knowledge to initiate change in improving the quality of care and health outcomes for individuals, communities, and populations. Change requires health care improvement leaders who are well informed in improvement strategies and can create a culture that will mobilize inter-professional teams to design and implement improvement interventions. But being a nurse practitioner working in a busy clinical practice, I have difficulty initiating QI projects due to limited time, lack of knowledge and resources available to support such efforts. I am interested in participating in the improvement scholars' program to give me the opportunity to receive the necessary training, mentorship, to acquire new skills and knowledge, and to better understand the process of designing a project.

As for myself, Ashmita Chatterjee, I believe joining a Healthcare Quality Improvement Scholars Program will offer me several benefits, including professional development in that I will gain new skills and knowledge in quality improvement methodologies, healthcare systems and operations, patient safety, and leadership. I have received both my Yellow and Purple Belt certifications through UNC. Most recently I have been working on a rounding efficiency project for our hospital medicine division as well as in the Children's Hospital, improving our clinical metrics in the management of pediatric sepsis. I also believe participation in this program will help with networking opportunities, allowing me the opportunity to connect with healthcare leaders and professionals from a variety of disciplines, building an invaluable network where we can continue to collaborate in the future. In addition, this program will allow for hands-on experience where I would have the opportunity to work on a project I am passionate about and gain practical experience in leading and implementing change in the hospital system.

Which UNC Health improvement priority will your project address? The proposed project will address improvement goals that are priorities for UNC Health including patient harm prevention and hospital length of stay reduction. Given the morbidity and mortality linked with severe alcohol withdrawal (AW) syndrome[1], anticipating the risk of withdrawal using the prediction of AW Severity Score (PAWSS)[2,3] calculator integrated into Epic will aid in speeding treatment, provide appropriate risk-based management, reduce episodes and severity of AW, reduce need for transitions to higher level of care and reduce length of stay.

What is the problem or gap in quality you seek to improve? UNC Hospitals, specifically the hospital medicine service, has a significant need to properly manage patients at high risk for AW and seeks to implement a screening tool to address this need. UNC Hospitals not have standardized screening criteria for assessing risk of AW syndrome. If there is, it is not being used or documented. Identification of patients at risk is not timely and often occurs at the onset of severe symptoms. Given the morbidity and mortality linked with AW syndrome, anticipating the risk of withdrawal may aid in speeding treatment or even preventing incipient withdrawal. The Clinical Institute Withdrawal Assessment for Alcohol (CIWA)[4] is the scoring system used by nurses at UNC Hospitals to assess, and document in Epic, the severity of patients' AW symptoms. A CIWA score >20 is considered severe AW. When we reviewed a

random sample of 50 patients admitted to the Hospital Medicine (HM) service between July 2022 and December 2022 with AW on their problem lists, we found that almost 1 in 3 patients had severe symptoms of AW at some point during their hospitalization.

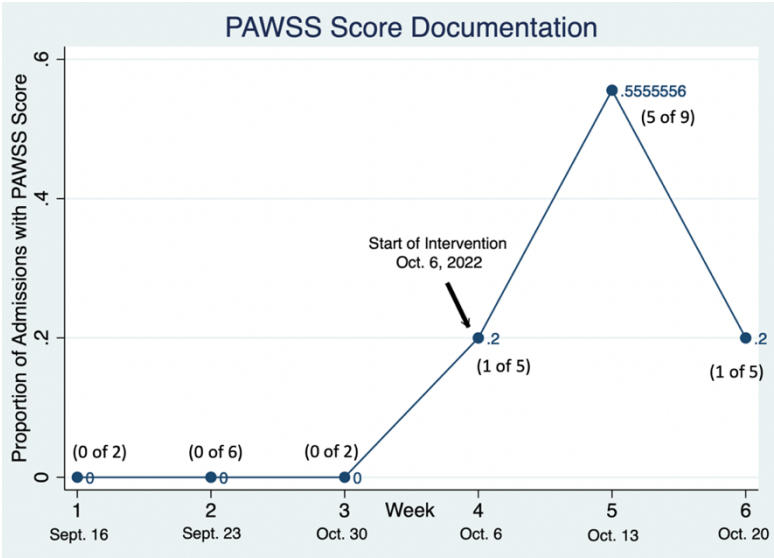
Describe the patient population affected, scope, and impact of the problem

- **What is the specific patient population your project will impact?**
  All adult patients 18 years old and above admitted to the HM service with a diagnosis of alcohol use disorder (AUD) in their problem lists and who are therefore at risk for AW.
- **How many patients are in the population?**
  We reviewed all admissions to the HM service between July 2022 and December 2022 and identified all patients with a diagnosis of AUD in their problem lists. The median number of patients admitted with AUD to HM was 9 (range: 4-20) per week during the 6-month period.
- **How frequently does the problem occur**?
  Using Business Objects (BO) we pulled data on all patients admitted to the HM service with a diagnosis of AW on their problem lists from July 2022 to December 2022. We reviewed CIWA scores for a random sample of 50 patients in order to determine if they experienced severe AW (CIWA ≥ 20) at any point during their hospitalizations. Fifteen of 50 patients (30%) were found to have had severe AW at some point during their hospitalizations.
- **What is the impact of the problem**?
  Among hospitalized patients, AUD has been reported in 10-32% of the patients[5]. Globally, harmful use of alcohol is responsible for 33 deaths per 100,000 people and 85 million disability-adjusted life years annually.[6] One serious consequence of chronic alcohol use is the potential for alcohol withdrawal syndrome (AWS). AWS is a well-known condition occurring after intentional or unintentional abrupt cessation of heavy/constant drinking, and it occurs in about 8% of hospitalized AUD inpatients[7]. Severe AWS more than doubles the length of stay and frequently requires treatment in the ICU. However, with early detection and appropriate treatment, the expected mortality is in the range of 1% or less.[7]

What do you think are the underlying causes of the problem? Why do you think the problem is happening? As described above, preliminary analysis of retrospective data show that 30% of patients with AW have severe symptoms at some point during their hospitalizations. We hypothesize that this is due to delay in administering benzodiazepines during the admission process in patients at high risk for withdrawal. There are several assessment tools available to identify patients at risk for AW syndrome. Our institution does not have standardized screening criteria for assessing risk of AW syndrome. The PAWSS[2,3] is the first validated tool to identify patients at risk for complicated AW allowing for prophylaxis against AWS before severe symptoms occur. The PAWSS tool consists of three parts: A)the threshold criteria, whether the patient consumed alcohol during the 30 days prior to admission, then it opens up to the series of yes/no question from B) patient interview (1-if have been recently intoxicated or drunk within the last 30 days, 2-if experienced previous episodes of AW, 3-if had withdrawal seizures, 4-if had delirium tremens, 5- undergone alcohol rehabilitation, 6-ever experienced blackouts, 7-combined alcohol with other downers, 8- if combined alcohol with other substance of abuse), and the clinical evidence part C) whether they have a positive alcohol blood level on admission or evidence of increased autonomic activity (HR>120, tremor, sweating). ***See Appendix for PAWSS score details***. The CIWA scale is effective at assessing AW severity once a patient is already experiencing withdrawal, but it does not predict severity of withdrawal like the PAWSS. Once a patient is determined to have AW or at risk for AW by providers, CIWA is the most common method of assessing severity of AW symptoms at

our institution and there is a standardized protocol for nursing to assess and document CIWA score in Epic. ***We hypothesize that provider education and availability of a PAWSS calculator in Epic will facilitate early administration of benzodiazepines in patients at high risk for AW.***

What is the history of improvement or attempted improvement at UNC Health? What work will your proposed improvement build on? We conducted a quality improvement (QI) project in 2022 to investigate: 1) the proportion of patients admitted to the HM service with a diagnosis of AUD that were subsequently started on CIWA protocol at the time of admission and 2) if providing admitting HM physicians information about PAWSS would improve care processes in patient admitted with AWS. The care processes investigated were the proportion of patient placed on CIWA and documentation of PAWSS in Epic. The intervention involved secure chatting admitting physicians in Epic about the use of PAWSS in managing their patients admitted with AWS. The secure Epic chats occurred just prior to physicians starting their admission shifts. We reviewed medical records of all patients admitted to the hospital medicine service with a diagnosis of alcoholic use disorder at 3-weeks prior to PAWSS score implementation and 3-weeks after implementation. Overall, there were a total of 29 patients that met inclusion criteria during the PDSA. Patients' average age was 48.3 years and 86.2% were men. The figure shows the proportion of admissions for AWS before and after implementation of PAWSS secure chat alerts in which a PAWSS score was documented in the admission note.



<u>Lessons Learned</u>: Based on chart review, all patients were started on CIWA protocol on the day of admission. This indicates that admitting providers are aware that patients are at risk for AWS before and after the intervention. A limitation of our data is that we did not assess if patients were initiated on "as needed" benzodiazepines only for withdrawal symptoms or if patients were ordered scheduled benzodiazepines in addition to as-needed doses benzodiazepines based on CIWA scores. This difference in management may have significantly affected patient outcomes. It's possible that our intervention may have affected the intensity of CIWA management rather than just the frequency of using CIWA management. Future projects should focus on the effect of the intervention on the intensity of CIWA management and administration of scheduled benzodiazepines on admission. Our current proposed IHQI project will investigate this as a process measure.

Measures Table

Measure Name	Measure Type	Measure Calculation	Measure Exclusion	Data Source	Baseline	Goal	Collection Frequency
% AW patients with CIWA scores in the severe range (> 20) indicating severe AW	Outcome	Numerator: HM patients with AW and CIWA score > 20 during hospitalization Denominator: all HM patients with AW	Patients < 18 years old	BO, Epic	30%[Δ]	15% (50% reduction)	Every 2-weeks
% AW patients requiring transfer to a higher level of care	Outcome	Numerator: AW patients requiring transfer to a higher level of care Denominator: all HM patients with AW	Patients < 18 years old	BO	TBD	50% reduction	Monthly
Hospital length of stay	Outcome	Length of stay for all HM patients with AW	Patient < 18 years old	BO	9 days	Less than7 days (25% reduction)	Monthly
% Patients placed on scheduled CIWA benzodiazepines on admission	Process	Numerator: HM patients with AUD and on standing benzodiazepines Denominator: all HM patients with AUD	Patient < 18 years old	BO	TBD	50% increase	Weekly
% Patients with over-sedation[β]	Balancing	Numerator: over-sedation documented in Epic for HM patients with AW Denominator: all HM patients with AW	Patient < 18 years old	BO, Epic	TBD	O% increase	Monthly

AW: alcohol withdrawal in problem list, HM: hospital medicine, BO: Business Objects
AUD: alcohol use disorder, CIWA: Clinical Institute Withdrawal Assessment for Alcohol
[Δ] based on a random sample of 50 patients admitted to HM over the past 6-months with AW
[B] Use search terms in Epic (e.g., “over sedated”, “excessive sedation”, “encephalopathy”, “altered mental status”, “somnolent”) then manually review relevant notes written during the hospitalization.

What ideas do you have for changes that will result in improvement? The aim of this quality improvement project is to improve identification of patients admitted with high risk of AW by using a PAWSS calculator that will be implemented in Epic. A PAWSS calculator will be added to the Scoring Tool

folder in Epic (see Appendix for sceenshot) for easy use and access by HM admitting providers. When admitting patients with alcohol use disorder (AUD) providers will navigate to the Epic Scoring tool and access the PAWSS calculator. The project team will work with ISD and team member Dr. Leo Marucci (Associate CMIO, UNC Health) to facilitate integrating the PAWSS calculator into Epic.
In discussions with Dr. Marucci, implementing the PAWSS calculator would likely not face significant barriers from ISD because it is a passive decision support system that will not interrupt provider workflow and would only be available to providers that navigate to the calculator by clicking on the Scoring Tool tab in Epic. As described in the Project Timeline section of our proposal, the implementation of the PAWSS calculator will begin as soon the project team is notified that IHQI funding has been awarded. This way we'll have completed the PAWSS calculator Epic implementation prior to the official project start date on September 1, 2023. We will conduct educational sessions to HM providers on use of the PAWSS calculator and documenting PAWSS scores in Epic at scheduled HM division noon conferences as well as sending out email reminders to HM providers to use the PAWSS calculator. Using chart review of Epic, we will also provide feedback to HM providers on their compliance with documenting PAWSS scores in their admission notes for patients with AW. Hospitalist providers will screen patients using the PAWSS tool on admission. The providers will record the PAWSS score into the history and physical admission note under social history or in their assessment/plan part. If the PAWSS score is >=4 (high risk to develop complicated AW syndrome), the provider will place the patient on CIWA protocol on admission. The patients will be monitored for symptoms of AW using CIWA scores documented by nurses as part of their current workflow. A CIWA score >20 indicates severe complicated AWS. Monitoring CIWA scores will identify if a patient is having moderate or severe symptoms of AWS, resulting in timely initiation of scheduled plus symptom-triggered benzodiazepine treatment. The project team will perform Business Objects queries and chart review to obtain CIWA scores, amount of benzodiazepines administered, whether benzodiazepine was ordered as scheduled and or "as needed". The team will also record whether patients admitted to the floor developed severe AW symptoms requiring transfer to the step-down unit or intensive care unit (ICU).

How has this problem has been addressed successfully elsewhere? Benzodiazepines have long been the mainstay of treatment for AW. Benzodiazepines are agonists at the GABA receptors and, as such, are cross-tolerant with alcohol. They act to increase the frequency of the GABA-receptor opening and enhance the inhibitory action of GABA. Benzodiazepines decrease symptom severity, the risk of delirium, and the length and frequency of seizures associated with AWS. Several benzodiazepines are available to treat AWS, the use and preference varies from every institution. A systematic review of 64 studies found no statistical difference among various benzodiazepines not withstanding some trend favoring chlordiazepoxide for symptom control.[1] Maldonado et al.[2], performed a pilot study on the PAWSS tool. The first pilot study by Maldonado et al. (2014) found that the PAWSS tool had a sensitivity, specificity, and positive and negative predictive values of 100%, using the threshold score of greater than or equal to four. In a subsequent prospective validation study of 400 patients hospitalized on general medicine and surgery units, Maldonado[3] evaluated the sensitivity of PAWSS to identify complicated withdrawal at 93.1% and specificity at 99.5%. Therefore, PAWSS has excellent performance characteristics and predictive value among medically ill hospitalized patients, helping clinicians identify those at risk for complicated AWS. PAWSS is recommended by the American Society of Addiction Medicine as a validated tool to assess risk for severe AW.

How will high performance management tools be used to support the work? We plan to make use of the high performance management tool of Just Culture. Just Culture is a framework that balances accountability with learning and supports a fair and non-punitive environment for both patients and healthcare providers. By implementing Just Culture, the project can ensure that patients who are at

higher risk for AW receive appropriate care and treatment, while also providing a safe and supportive environment for healthcare providers to discuss any challenges or errors that may arise. Additionally, Just Culture will encourage a culture of open communication and continuous improvement, allowing the project to evolve and adapt over time to better meet the needs of patients and providers. Lastly, our project will utilize effective team communication and teaming skills as a high-performance management tool. This will involve regular meetings, clear and concise updates, and open discussion among team members to ensure that all aspects of the project are understood and executed efficiently. The team will also make use of active listening, empathy, and collaboration to overcome any challenges that may arise during the implementation process. By fostering a positive team environment and utilizing effective teaming skills, the project is more likely to be successful in achieving its goals and making a positive impact on patient care.

Please describe how your project addresses each of the 5 elements reflected in the Quintuple Aim for Health Care Improvement.

- Improved health - Our proposed project will assess measures of improved health in the population of patients admitted with AW. Improving health outcomes such as reducing the proportion of patients experiencing severe AW (CIWA >20) and the proportion of patients with AW requiring transfer to the intensive care unit will be evaluated.
- Enhanced patient experience - one of the primary aims of our project is to reduce the incidence of severe AW symptoms in patients admitted to the hospitalist service. Symptoms patients with AW can experience range from tremulousness, anxiety, headache and diaphoresis with mild to moderate withdrawal to seizures in patient with severe withdrawal. By implementing interventions to optimize treatment for AW, our proposed project has the potential of reducing patient morbidity and enhancing patients' experience during their hospitalizations.
- Enhanced clinician and staff experience - We hypothesize that clinician and staff experience will be enhanced by having to manage fewer patients experiencing severe AW and possibly AW seizures. This is especially true for providers who work during night shifts (e.g., project lead for this grant). It is common during evening shifts, when the hospital is not fully staffed, for patients admitted with AW to decompensate and develop severe symptoms and seizures. It is usually the evening cross-covering provider who must rush to the bedside, assess the patient and make a decision on management which may include increasing medication, escalation in care, and/or calling a rapid response. Many of these situations might be avoided if admitting providers had access to tools and care processes that ensure at risk patients are placed on appropriate therapy for AW.
- Health equity - There is a possibility that our intervention may unintentionally cause disparate outcomes in various patient populations. Therefore, we will stratify all outcome and process measure results by age, gender, race and ethnic groups. If we observe significant variability in outcome and/or process measures by group, then we will evaluate the data to find potential causal factors for observed disparities. This information will be used to develop interventions and PDSAs designed to narrow any observed disparities. A potential roadblock to this method is that there be insufficient sample size to stratify data and evaluate results for meaningful group disparities (e.g., only 1 or 2 patients in a demographic group). We reviewed retrospective data on patients admitted with alcohol use disorder during the last 6-months of 2022 (n=260) admitted to the HM service. The table shows a demographic breakdown. Based on this data our project will be able stratify data by age

Patient Characteristics	Value (n)
Female gender at birth, %	31.9 (83)
Median age years, range	53 (19 – 89)
Age ≥ 65 years, %	13.4 (35)
Race, %	
• White	70.4 (183)
• Black	17.3 (45)
• Other races$^{\phi}$	12.3 (32)
Latino/Hispanic, %	5.4 (14)

and race (with exception of non-Black/White). Because Latino ethnicity is a small proportion of the population, stratifying outcomes in this group may not be feasible until the end of the project when sufficient numbers of patients have been evaluated.

- Reduced costs - We will evaluate length of stay (LOS) as one of our outcome measures. We hypothesize that we'll observe reductions in LOS by reducing severity of AW symptoms. The baseline median length of stay for this patient population is 5 days (range: 1 – 84) with an average LOS of 9 days (SD: 12.0). Our goal is to reduce average LOS by at least 25%, resulting in reduced cost to UNC Health given that many in this patient population are uninsured or underinsured.

Please describe the support and engagement you have from leadership for the work you are proposing. Please indicate leaders with whom you have consulted about this proposal. As part of the Hospitalist group, I am fortunate to work with clinicians who are leaders and educators. They have worked on multiple quality improvement projects to improve patient care, which inspired me to initiate this project. During my employee evaluation last year, I mentioned my Doctorate of Nurse Practitioner (DNP) project titled," Improving identification of admitted patients at high risk for AW syndrome using the predication of AW severity scale (PAWSS) tool" to my division chief Dr. Hemsey. I told him that I wanted to implement it in our service. He was enthusiastic about the idea and encouraged me to do it. He said to reach to Dr. Carlton Moore, our Associate Chief for Research and Quality Improvement, for help. I then emailed Dr. Moore to discuss my idea, and he quickly responded. He scheduled a zoom meeting to discuss my project further. Since then, he's set up zoom meetings every 2-3 weeks to see how my project was going and to ensure I had everything I needed to complete my project. He also suggested I join one of the monthly "work in progress" meeting to present the idea to the hospitalist providers. I had the chance to talk about my project with hospitalists providers and receive positive feedback. Dr. Moore helped me from the beginning until the completion of my DNP project. He encouraged me to apply for the IHQI scholarship grant so I can continue my project, so here I am. I have received tremendous support and encouragement from him and the hospitalist team. I have also reached out to Dr. Marucci to discuss how to add the PAWSS calculator to the Epic Scoring Tool. Overall, everyone has been very supportive and helpful.

Support and engagement from leadership for any proposed work is an important factor for its success. Without their support, it can be challenging to implement changes and secure resources. It is crucial to communicate the benefits and importance of the proposed work and to involve leadership in the planning and decision-making process to increase the chances of their support and engagement. We are fortunate to have a great deal of support and engagement from our Hospital Medicine leadership for our project. So much so, in fact, that the Chief of our division is our project supervisor. We have consulted with him for our project extensively and he is not only in support of the project, but willing to ensure that at our weekly division meetings, we are provided the opportunity to speak about the project, provide reminders to our hospital medicine group regarding the need for their continued engagement, and will himself advocate the benefits this engagement will bring to our group and this patient population.

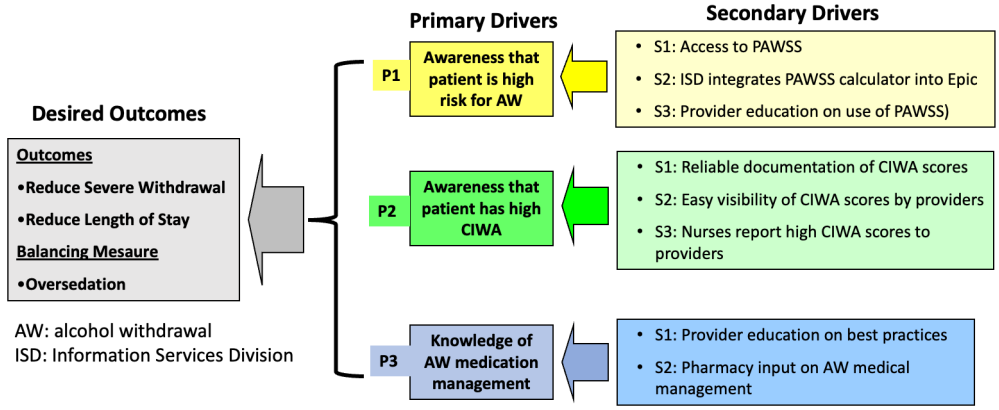
Project Team. Our project team will function using teamwork and collaboration. Teamwork is anything that improves commitment, communication, cohesion, cooperation and celebration within the team. It is the responsibility of the Team Leader to set up the agenda and meeting time with team members, participate as a team member, guide the Team by allowing the free exchange of ideas and involving all team members in the process, ensure proper documentation of team activities including allocation of responsibilities for data collection and minute taking, communicate with the Administrative Representative overseeing that process, and communicate Team's progress to the QC. Team Members will establish and adhere to the rules for team conduct, offer ideas on issues addressed by the team, participate in all team meetings, perform assigned tasks between meetings, participate in evaluation of problems and determine root causes, participate in setting goals and developing action plans for the team, recommend agenda items for future meetings, critique and offer suggestions for improving the meeting process, implement recommendations of the team and monitor results, and assist in the preparation and presentation of documentation and reports on team activities and result

Team Member	Project Role	Qualifications
Amy Dacillo-Curso, ACNP	Project Lead	Training for Doctor of Nursing Practitioner (DNP)
Ashmita Chatterjee, MD	Project Co-lead	Yellow belt, Purple belt, Physician Lead (Medicine Consult Service)
Nikia Smith, BSN RN NE-BC	Nurse advisor	8 Bed Tower Nurse Manager
Jennifer Barrow, PharmD	Pharmacy advisor	Clinical Pharmacist
David Hemsey, MD	Project Supervisor	Chief, Division of Hospital Medicine
Leo Marucci, MD	Project Sponsor	Associate Chief Medical Informatics Officer, Lead Informatics Physician
Carlton Moore, MD MS	Advisor	Associate Division Chief, Hospital Medicine

How will you ensure sufficient time to dedicate to the project over the scholar year? Although time commitment to the program varies throughout the year, Scholars may expect to spend at least 2 hours per week (with range from 1 hour minimum to 5 or more hours a week) on project-related activities. Effective time management and knowing what to prioritize will play a big role in ensuring sufficient time to dedicate to this project. By assessing what needs to be achieved within a given timeframe, setting priorities for each day, week, month and year can help accomplish goals. We will create a project timeline. By having a timeline in place, this will give us a view into what the team need to work on and when. In order to avoid being overwhelmed, the team will break down the project into smaller tasks to be completed on a daily and /or weekly basis. We will give each task a due date and assign them to team members. Additionally, we hope to recruit interested medicine residents and medical students onto the project team. This will provide them with the opportunity to learn about quality improvement and potentially get involved in writing a peer-reviewed abstract or manuscript.

What factors do you anticipate will foster and hinder improvement? To determine factors that might foster and hinder our proposed project, we created a draft driver diagram (Figure). A key factor for the success of the project is shown in our 1st primary driver (P1), awareness the patient is high risk for AW. The secondary drivers for P1 involve providing easy access to the PAWSS calculator via Epic and provider education on use of the Epic PAWSS calculator. Our proposed project will focus on the HM service and the HM Division Chief is Dr. David Hemsey and he fully supports our proposed project and is the project supervisor. He has agreed to allow our project team to present a set of educational talks at the division noon conference to educate providers on use of the PAWSS calculator. Additionally, Dr. Leo Marucci (Associate CMIO, UNC Health) is the program sponsor and will facilitate integration of the PAWSS calculator into the Epic Scoring Tool. A potential hindrance to the project would be delay integrating the

PAWSS calculator into Epic. We plan to mitigate this potential barrier by starting the process for integrating the PAWSS calculator when IHQI has made its funding decisions in early April 2023. This will give the project team approximately 5-months to integrate PAWSS into Epic before IHQI project support begins in early September 2023.



The second primary driver, awareness that patient has high CIWA, is contingent on the secondary drivers shown in the figure. S1 and S2 are existing components of nurse workflow. S3 is more variable and relies on CIWA orders in Epic stipulating that nurses contact providers if patients' CIWA scores are above a given threshold, currently this is >25 (very severe withdrawal) as a default in the current CIWA Epic order set. We propose to have providers add a nursing order that direct nurses if CIWA scores exceed 15, this will allow providers to escalate benzodiazepine treatment prior to patients having severe AW. The project will work with both nursing and HM providers to implement this protocol and we anticipate conducting several PDSAs to optimize this process.

Finally, HM providers are sometimes unsure of appropriate benzodiazepine regimens to use in patients at risk or experiencing AW. There are many options available in the Epic CIWA order set. We will work with pharmacy to educate providers on appropriate benzodiazepine doses to administer to patients based on their current CIWA scores and response to medical management during previous hospitalizations for AW. For example, some patients may require phenobarbital to adequately treat AW and guidelines for use of phenobarbital are currently not available in existing Epic order sets.

What ideas do you have for sustaining the improvement? How do you see the work you start with IHQI's support continuing? To facilitate both scalability and sustainability of our work, we will work with the UNC Health Information Services Division (ISD) to develop and implement a best practice advisory (BPA) in Epic. The purpose of the BPA will be to alert admitting physicians when patients are at high risk for AW. Using data obtained from the project demonstrating improvement in outcomes, we will obtain buy-in from ISD to support BPA implementation with the help of project team member Dr. Marucci (Associate CMIO, UNC Health). One possible BPA trigger algorithm might be any patient admitted with alcohol use disorder and/or history of AW in their problem list. Prior to implementing any BPA trigger, we will work with ISD to test performance characteristics of various trigger algorithms by using retrospective data to determine how frequently various BPA triggers would fire based on previously admitted patients. We will calculate positive predictive values and negative predictive values for various algorithm iterations using manual medical record review in Epic and choose the BPA trigger algorithm that optimizes both PPV and NPV before implementing the BPA.

Table. Project Implementation Timeline

Phase	Month												
	-1	1	2	3	4	5	6	7	8	9	10	11	12
I													
II													
III													
IV													
V													
VI													

- **Phase I (**Prior to beginning of project support on 9/1/2023): Implement PAWSS calculator in Epic,
    - **Phase II.** Initial educational intervention for HM providers on use of PAWSS calculator in Epic
- **Phase III.** Adjustments to process implementation based on PDSAs
- **Phase IV.** Assess outcome and process measures
- **Phase V.** Develop toolkit for scaling intervention out to other units
- **Phase VI.** Develop and implement Epic BPA to alert hospital admitters about starting CIWA on high-risk patients**.** The Epic BPA will facilitate scalability and sustainability.

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APPENDIX

PAWSS scale for Alcohol Withdrawal [1]

Part A: Threshold criterion score	**(1 point either)**
1. Have you consumed any amount of alcohol (i.e., been drinking) within the last 30 days? **OR** Did the patient have a positive blood alcohol level (BAL) on admission?	_____
If the answer is yes to either question, proceed with test:	_____
Part B: Patient interview	**(1 point each)**
2. Have you been recently intoxicated/drunk, within the last 30 days?	_____
3. Have you ever experienced previous episodes of alcohol withdrawal?	_____
4. Have you ever experienced an alcohol withdrawal seizure?	_____
5. Have you ever experienced delirium tremens?	_____
6. Have you ever undergone alcohol rehabilitation treatment (ie, inpatient/outpatient treatment programs or Alcoholics Anonymous [AA] attendance)?	_____
7. Have you ever experienced blackouts?	_____
8. Have you combined alcohol with other "downers" like benzodiazepines or barbiturates during the last 90 days?	_____
9. Have you combined alcohol with any other substance of abuse during the 90 days?	_____
Part C: Clinical evidence	**(1 point each)**
10. Was the patient's BAL on presentation >200 mg/dL?	_____
11. Is there evidence of increased autonomic activity (i.e., heart rate >120 beats per minute, tremor, sweating, agitation, nausea)?	_____

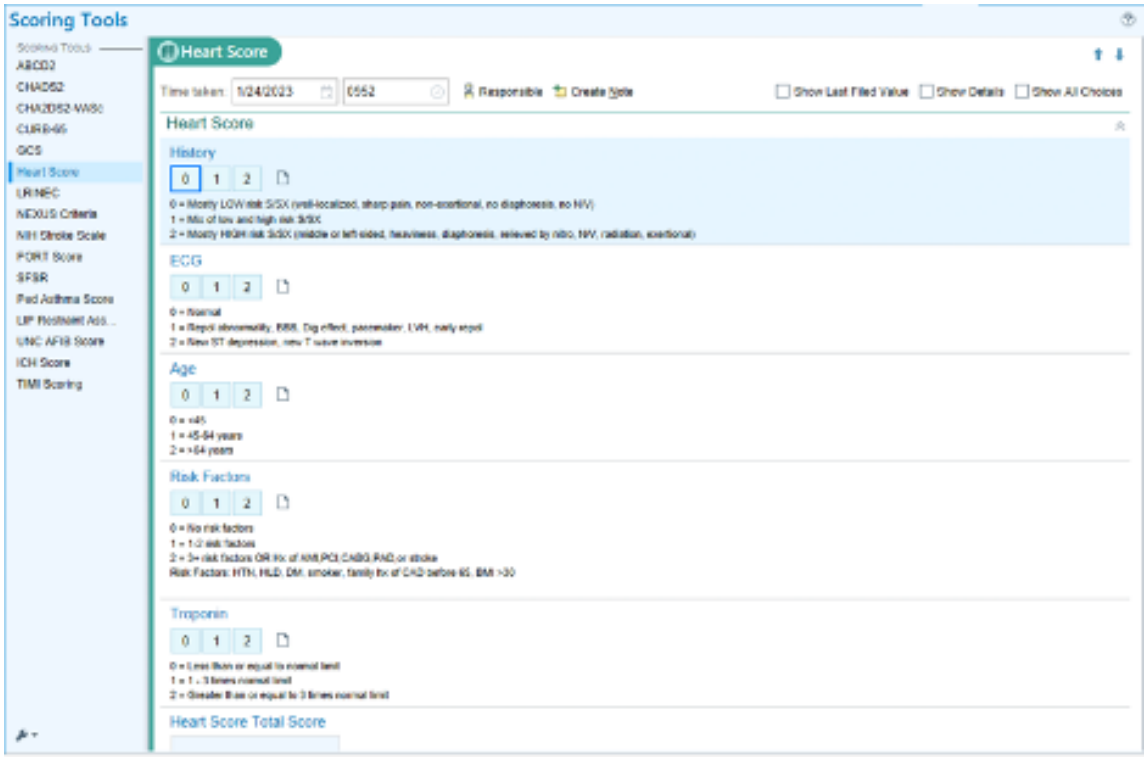
Total score	_____

NOTE: Maximum score = 10. This instrument is intended as a screening tool. The greater the number of positive findings, the higher the risk for development of alcohol withdrawal syndromes (AWS). A score of ≥4 suggests high risk for moderate to severe AWS; prophylaxis and/or treatment may be indicated.

Reference:

1. *Maldonado JR, Sher Y, Das S, et al. Prospective Validation Study of the Prediction of Alcohol Withdrawal Severity Scale (PAWSS) in Medically Ill Inpatients: A New Scale for the Prediction of Complicated Alcohol Withdrawal Syndrome. Alcohol 2015; 50:509.*

Scoring Tool Folder in Epic



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January 26, 2023

Dear Review Committee Members:

I am writing this letter to express my strongest support for Amy Dacillo-Curso, ACNP and Dr. Ashmita Chatterjee's IHQI Scholars Program application. As Chief of the Division of Hospital Medicine, I will be able to support their efforts on this important project.

The UNC Hospital Medicine division has developed expertise in providing care for those who require hospitalization for alcohol-related disorders and care for the large majority of these patients at UNC Medical Center and the Hillsborough campus. We are familiar with the challenges of identifying appropriate patients for targeted alcohol withdrawal. In our experience, without routine screening, some patients are not initially recognized at risk for serious withdrawal and may benefit from earlier identification and treatments to prevent escalation to delirium tremens.

Our division will give its full support to the project and we look forward to working closely with Ms. Dacillo-Curso and Dr. Chatterjee. Leo Marucci, who is also in or Division, will be an outstanding sponsor and will help facilitate implementation of the PAWSS calculator in Epic@UNC. We will ensure that any team members from Hospital Medicine have sufficient time to attend required quality improvement training, conduct the improvement project, and monitor and report on project progress. As you know, our faculty have been committed to continuous quality improvement and have led multiple previous projects sponsored through the IHQI that have improved patient safety with placement of central lines, standardized care for patients with alcohol abuse disorders, syncope and opiate use disorder-related infections, and optimized communications during Rapid Response team interactions.

Thank you for considering this proposal and the UNC Division of Hospital Medicine looks forward to working on these efforts to improve the quality of care for our patients.

Sincerely,

David F. Hemsey, MD
Professor of Medicine
Chief, Division of Hospital Medicine

Leonardo Marucci, MD
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January 31, 2023

Dear Review Committee Members:

As an Associate Chief Medical Informatics Officer (ACMIO) of UNC Healthcare, I am writing to express my full support for Nurse Practitioner Amy Dacillo-Curso's IHQI grant proposal to Improve Management of Alcohol Withdrawal amongst patients hospitalized with alcohol use disorder.

The project will involve implementing a scoring calculator within Epic that helps to identify patients at high-risk for alcohol withdrawal. Once identified, providers can be alerted to this finding and adjust care for that patient so that potential harm can be reduced and overall outcomes improved. I will work with the project team to navigate the protocol for building and implementing such a tool within Epic. As the project evolves, I can also work to help mitigate any barriers to implementation of the calculator and help optimize its use for specific scenarios. Depending on the results of the data collected during the project, system level advisories could also be implemented to help all of our providers throughout UNC Healthcare identify and safely manage these 'at risk' patients.

ISD is in full support of this project that helps minimize patient harm by identifying patients who may at risk for complications secondary to alcohol use disorder.

Sincerely,

Leonardo Marucci, MD
Associate Chief Medical Informatics Officer, Information Service Division (ISD), UNC Health
Associate Medical Director and Physician Advisor, Care Management, UNC Hospitals
Assistant Professor of Medicine, Division of Hospital Medicine, UNC School of Medicine