Inpatient Alcohol Withdrawal: Time to Prevent the Preventable?

Kendal Williams, MD, MPH^{1,2,3} and Matthew Mitchell, PhD^{1,2,3}

¹Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA, USA; ²Penn Presbyterian Medical Center, University of Pennsylvania Health System, Philadelphia, PA, USA; ³Center for Evidence-based Practice, University of Pennsylvania Health System, Philadelphia, PA, USA.

J Gen Intern Med 29(1):7–9

DOI: 10.1007/s11606-013-2642-7

© Society of General Internal Medicine 2013

The core principle of the hospital-based quality improvement movement is the appropriate application of systematic processes to ensure safe and reliable care. Using such processes, the incidence of hospital-acquired infections and other well-publicized indicators of suboptimal care have been reduced nationwide. The most successful institutions are actively identifying other undesirable “preventable” conditions to which they can apply similar care improvement strategies. Alcohol withdrawal syndrome (AWS) in the inpatient setting is one preventable condition worth targeting.

Any clinician who has had the misfortune of managing a patient in florid alcohol withdrawal can appreciate that it is a condition worthy of prevention. There is little in clinical medicine that is more disruptive to clinical staff than attempting to manage an agitated and delirious patient in a hyper-adrenergic storm, particularly before appropriate sedation is achieved. Mountains of sedatives are then required to navigate the patient through the storm, sometimes necessitating protracted intensive care unit (ICU) stays and an increased risk of mortality.

In principle, alcohol withdrawal that is not “present on admission” is entirely preventable with the appropriate institution of benzodiazepine-based detoxification protocols. Often however, patients at risk are not appropriately identified, or identified but undertreated by clinicians relying on their subjective judgment alone. Poor communication among nurses, physicians, and other providers regarding the patient’s true risk is also common. The Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar) is a widely used ten-question scale that assesses whether alcohol withdrawal is present and quantifies its severity.¹ The liberal institution of CIWA-Ar dosing protocols without safeguards to ensure proper diagnosis can lead to overuse of sedatives and further complicate the diagnosis and treatment of delirium from other causes.² Furthermore, the CIWA-Ar scale is not intended to be a screening tool to determine who is most at risk for withdrawal. Rather, it detects withdrawal symptoms in

those at known elevated risk and quantifies their severity. It is therefore most appropriately utilized in a coordinated protocol where patients are objectively screened for problem drinking and risk of withdrawal before CIWA-Ar screening is instituted to guide preventative treatment.

In this issue of JGIM, Pecoraro and colleagues describe the performance of the AUDIT-PC alcohol risk screening tool in detecting patients at risk for withdrawal in a hospitalized patient population at Christiana Care Health System.³ The AUDIT-PC is a subset of the larger ten-question AUDIT screening tool developed by the World Health Organization and widely validated internationally to screen for alcohol abuse disorders. The complete AUDIT is made up of three sections. AUDIT-C consists of the first three questions of the instrument and assesses alcohol consumption. It has been shown to predict postoperative complications in both noncardiac and orthopedic surgery, and is now sent to all veterans yearly by the Veterans Affairs (VA) health system to screen for alcohol abuse disorders.⁴ The AUDIT-D represents the next three questions and assesses the degree of patients’ dependence on alcohol. The final subset, AUDIT-P, consists of the remaining four questions, and assesses patients for any social problems associated with alcohol abuse. In the Christiana study, parts of the C and P subtests were combined in a novel shorter-form screening test—the AUDIT-PC.

Simultaneous with the study published here, we at Penn Presbyterian Medical Center in Philadelphia sought to design a similar protocol to prevent inpatient alcohol withdrawal. Before embarking on the project, the Penn Medicine Center for Evidence-Based Practice systematically reviewed the various screening instruments that could identify those at risk.⁵ From the review, we learned that common screening tools for alcohol abuse, such as the CAGE framework, are designed to diagnose problem drinking and are not necessarily reliable in predicting risk of alcohol withdrawal in the acute setting. Indeed, only a minority of patients who are problem drinkers will experience significant withdrawal symptoms with abstinence. In order to avoid overtreatment, it is thus necessary to identify those patients truly at risk.

Drawing on the work of Dolman⁶ and Reoux,⁷ we concluded, similar to the Christiana authors, that the AUDIT instrument had potential as a reliable screening

tool that could determine those at risk for alcohol withdrawal. Dolman demonstrated high sensitivity and specificity of the entire AUDIT scale in an unselected medical population, but had used the entire ten-question instrument to screen all patients, a practice that may be impractical for more universal application. Reoux studied the performance of AUDIT for predicting withdrawal in a detoxification population and demonstrated that various “short-form” subsets and specific questions of the complete AUDIT scale had high sensitivity and may be adequate for broader screening initiatives, though they lacked specificity in the more restricted detoxification population (Table 1).

The work presented by Pecoraro and colleagues³ builds on these earlier studies and assesses the value of a more practical short-form test based on AUDIT in an unselected medical/surgical population. The AUDIT-PC specifically includes the first two AUDIT questions addressing consumption, as well as questions about the inability to stop drinking, failed expectations as a result of alcohol use, and concern from family and friends. It does not include the potentially valuable “eye-opener” question.

As described by the authors, the Christiana study started as a quality improvement initiative to properly screen for high-risk patients, and therefore suffers from some of the limitations of quality improvement projects that morph into research. A less than ideal case-control design with appropriate statistical methods was ultimately required to retrospectively estimate the ideal cutoffs for the AUDIT-PC scale in predicting the development of withdrawal. Using a cutoff score of 8, the authors obtained a sensitivity of approximately 91 % and a specificity of 90 %. With these results, this is the first study to demonstrate that a practical short-form scale based on AUDIT has adequate performance as a screening instrument in a hospital population to detect

those at risk for withdrawal. As the authors note, however, a future prospective study is required to validate these findings. Comparative studies of different AUDIT-based screening tests and protocols are also needed. Given the number of different combinations of screening tests and protocols that could potentially be compared, the choice of the screening test and protocol to study will ultimately depend on the clinical context and how the results will be used. If the action to be taken as a result of the positive screen is simple and inexpensive, like asking more questions, then a low test threshold that favors sensitivity is appropriate. If the follow-up action is costly or poses risks to the patient, such as intense observation or postponing critical procedures, then it is better to choose a test with a higher threshold and increased specificity. Outcomes in such prospective comparative studies need to capture these important trade-offs.

At our institution, we implemented a two-step screening protocol by embedding the AUDIT-C in all nursing admission assessments to detect those who potentially drink enough to put them at risk for AWS, followed up by a physician assessment using the AUDIT-D and more specific questions about seizure and *delirium tremens* history to further define the risk for withdrawal. Combined with a standardized CIWA-Ar assessment and a stratified dosing protocol based on level of risk of withdrawal, our hospital was able to reduce the incidence of coded alcohol withdrawal that was not “present on admission” by approximately 45 % from 2010 to 2011, while the incidence of ICU stays in all patients coded as alcohol withdrawal decreased approximately 65 % (unpublished data).

The lesson from this new study and from our own quality improvement work is that hospitals need not wait for more evidence, but rather can and should embark on developing screening and assessment protocols that detect high-risk patients and initiate appropriate management algorithms. As the current state of research does not yet define which screening tool is clearly the best performer, and differences in performance appear to be small, hospitals might consider themselves free to experiment with the use of whichever of the AUDIT scales fit well within their nursing and provider workflow. In the end, like much of our quality improvement work, it may matter less which specific tool is used, and more whether that tool can be systematically and reliably used by staff who understand its strengths and limitations.

Table 1. Summary of the Performance of the AUDIT Scale and Sub-Scales in Predicting Risk of Alcohol Withdrawal (Adapted From Mitchell and Williams)⁵

Study	Patients	Definition of withdrawal	Test and threshold	Sensitivity/Specificity
Dolman 2005	874 hospital inpatients	CIWA-Ar > 10	AUDIT ≥ 8 AUDIT ≥ 13	100 %/91 % 100 %/96 %
Reoux 2002	118 detox inpatients	CIWA-Ar > 9	AUDIT ≥ 27 AUDIT-C ≥ 11 AUDIT-D ≥ 8 AUDIT-P ≥ 8 ≥ 7 drinks/day Unable to stop drinking Failed to meet others' expectations Eye-opener	98 %/24 % 91 %/25 % 93 %/29 % 93 %/11 % 95 %/21 % 96 %/17 % 91 %/21 % 95 %/33 %

Acknowledgements: We would like to acknowledge Barbara J. Anderson, RN, MSN for reviewing a previous version of this manuscript, and Asaf Hanish, MPH and Craig A. Umscheid, MD, MSCE for their assistance with examining the impact of our alcohol withdrawal prevention program at our local institution.

Conflict of Interest: The authors declare that they do not have a conflict of interest.

Corresponding Author: Kendal Williams, MD, MPH; Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA, USA (e-mail: Kendal.williams@uphs.upenn.edu).

REFERENCES

1. **Sullivan JT, Sykora K, Schneiderman J, Naranjo CA, Sellers EM.** Assessment of alcohol withdrawal: the revised Clinical Institute Withdrawal Assessment for Alcohol scale (CIWA-Ar). *Br J Addict.* 1989;84:1353-7.
2. **Hecksel KA, Bostwick M, Jaeger TM, Cha S.** Inappropriate use of symptom-triggered therapy for alcohol withdrawal in the general hospital. *Mayo Clin Proc.* 2008;83(3):274-9.
3. **Pecoraro A, Ewen E, Horton T, Mooney R, Kolm P, McGraw P, Woody G.** Using the AUDIT-PC to predict alcohol withdrawal in hospitalized patients. *J Gen Intern Med.* 2013. doi:10.1007/s11606-013-2551-9.
4. **Bradley KA, Rubinsky AD, Sun H, et al.** Alcohol screening and risk of postoperative complications in male VA patients undergoing major non-cardiac surgery. *J Gen Intern Med.* 2011;26:162-9.
5. **Mitchell MD, Williams K.** Screening tests for recent heavy alcohol use. Philadelphia: Penn Medicine Center for Evidence-based Practice. 2009 Sep. Report No. R-85. Available at <http://www.uphs.upenn.edu/cep/>.
6. **Dolman JM, Hawkes ND.** Combining the audit questionnaire and biochemical markers to assess alcohol use and risk of alcohol withdrawal in medical inpatients. *Alcohol Alcohol.* 2005;40(6):515-9.
7. **Reoux JP, Malte CA, Kivlahan DR, Saxon AJ.** The alcohol use disorders identification test (AUDIT) predicts alcohol withdrawal symptoms during inpatient detoxification. *J Addict Dis.* 2002;21(4):81-91.