

## Research Article

# Current Practices of Ethanol Administration in the Prevention and Treatment of Alcohol Withdrawal Syndrome: A Survey of U.S. Academic Medical Centers

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**Abstract**

**Study objective:** To characterize national hospital practices for treating patients with ethanol for alcohol withdrawal syndrome.

**Design:** Cross-sectional survey

**Setting:** A 9-item survey conducted via telephone or email.

**Participants:** Physician, clinical pharmacist or clinical dietitian from 117 academic medical centers located within the United States.

**Measurements and main results:** Data were collected between August and October 2014. Hospitals ranged in size from 160-3,098 beds (mean 659). Of the 117 institutions that were contacted, 88 (75.2%) responded. Ethanol is administered at 31 (35.3%) of responding institutions. Yet, no protocol is in place to facilitate ethanol administration in 23 of the 31 medical centers (74%). The Department of Pharmacy is responsible for procurement and distribution of the ethanol in 27 (87%) of these medical centers.

**Conclusions:** Over one-third of surveyed academic medical centers in the United States continue to dispense ethanol to patients despite a lack of established guidelines regarding ethanol administration for alcohol withdrawal syndrome. The vast majority do so without an institutional protocol or policy.

**ABBREVIATIONS**

AWS: Alcohol Withdrawal Syndrome

**INTRODUCTION**

Ethanol dependent patients who are admitted to the hospital for non-ethanol related injuries or disease can be challenging for clinicians. For years clinicians have debated the practice of providing ethanol to patients for the prevention and treatment of alcohol withdrawal syndrome (AWS) due to both clinical and ethical concerns. While the use of ethanol for medicinal purposes is not a new concept many clinicians struggle defining its role in preventing or treating AWS [1,2]. This led us to question whether other academic medical centers currently dispense ethanol for prevention or treatment of AWS.

Ethanol is the most commonly abused drug in the United States, affecting 17.6 million Americans [3]. Management of ethanol-related complications consumes an undue amount of health care resources. In 2006 excessive ethanol consumption cost the United States \$ 223.5 billion, 11% of which were health care related costs [4]. Alcohol withdrawal influences up to 24% of hospitalizations in some settings and 16-31% of patients develop AWS while staying in intensive care units [5-7]. These material and financial burdens compel providers to seek out practical solutions for the prevention and treatment of AWS.

Currently, the first-line choice to treat AWS are drugs classified as benzodiazepines [8]. There is no evidence to support that ethanol used as a medicinal agent is more efficacious or less harmful than benzodiazepines. There is currently no authoritative guideline for the routine use of ethanol for this indication [9].

Clinical trials studying the efficacy of intravenous (IV) and oral ethanol have yielded mixed results. There is no standard for dose, rate or route of administration for the use of ethanol for this indication [9-12]. Moreover, ethanol is a well-established toxin affecting the human central nervous system, bone marrow, liver and pancreas. Its use is not recommended by psychiatric experts for the in-hospital treatment of substance abuse [13]. Ethanol is not used or recommended for use by substance abuse facilities specializing in recovery by patients from alcoholism. Yet, ethanol is still used to prevent and treat AWS in some hospitals.

We hypothesized that there continues to be high variability among institutional practices for administering medicinal ethanol to patients. To test this hypothesis, we undertook a comprehensive survey of 117 academic medical centers across the United States describing the current practice of providing ethanol to inpatient medical and surgical patients at risk for AWS.

## MATERIALS AND METHODS

### Survey questions and administration

We administered a 9-question survey (Table 1) by telephone or email to collect information regarding institutional practices as they relate to the use of ethanol to prevent and/or treat AWS. If an interviewee was unable to speak via telephone due to time restraints the survey was sent via email. The survey questions were developed by a multi-disciplinary team representing physicians, pharmacists, and clinical dietitians. These questions were then reviewed by members of the department of medicine as well as experts in survey research. A prewritten script was composed to ensure consistency among telephone surveyors.

### Selection of medical centers and participants

The primary study group consisted of 117 academic medical centers selected based upon their affiliation with major allopathic medical schools across the United States. The main campus hospital was chosen from each medical school. Surveyors contacted the main office of the department of surgery, pharmacy, or nutrition at each institution and were then directed to a physician, clinical pharmacist or clinical dietitian who self-

identified as having knowledge of the institutional practices of using ethanol for the prevention and treatment of AWS. No incentives were offered to complete the survey.

### Collection and evaluation of data

Survey question data were collected via telephone or email during the months of August -October 2014. Descriptive data for each medical center were obtained from their professional website. To avoid confounding outliers, we compared demographic data from centers that did not respond to the survey. The Human Investigation Review Committee reviewed and approved the experimental design; the study was exempted from informed consent since data were de-identified.

## RESULTS AND DISCUSSION

### Results

**Descriptive results:** The majority of responding institutions were located in the Northeast (36.7%) followed by the Midwest (23.1%) and the Southeast (13.6%). Of the hospitals surveyed, 105 of 117 were level 1 trauma centers, 7 were level 2 trauma centers, 1 was pediatric trauma only and 4 were not trauma centers. The number of beds ranged from 160-3,098 (mean 659), with 37 medical centers having 500 or fewer beds and 80 medical centers having greater than 500 beds. The characteristics between those who participated in the study and those who refused were similar.

**Survey results:** There were 88 respondents to our survey of 117 academic medical centers (75.2%). Of the responders, 57 (64.8%) did not administer ethanol to patients either at risk for or suffering from AWS. Of the 31 hospitals that do administer ethanol to their patients, 23 (74%) do not have a protocol in place for patient selection, dosing, monitoring, and administration of ethanol. The majority (77.4%) of surveyed academic medical centers administered ethanol to less than 10% of patients at risk for developing AWS. Ethanol was used for prevention of AWS in 14 (45%) surveyed medical centers while 16 (51.6%) used ethanol for both treatment and prevention. No institutions used ethanol solely for the treatment of withdrawal. Beer was the most readily available formulation of ethanol, followed by hard liquor, consisting of vodka, whiskey, or bourbon. The department of pharmacy was solely responsible for dispensing ethanol in 23 institutions, the food services department in 4 and both shared responsibilities in the remaining 4 institutions. The remaining results are summarized (Table 2).

### Discussion

This study showed that the long-established tradition of providing ethanol to hospitalized patients is still being practiced in 35% of the surveyed US academic medical centers, despite the absence of definitive evidence supporting the efficacy or safety of ethanol for AWS. Previous ethanol surveys demonstrated higher rates of hospitals that dispensed ethanol to patients [14,15]. A majority of the institutions surveyed rely on the department of pharmacy to dispense ethanol to patients.

Ethanol is an intoxicating water soluble alcohol that when ingested can result in slurred speech, incoordination, cognitive impairment and coma. This intoxication is due to ethanol's activation of the  $\gamma$ -aminobutyric acid (GABA) receptor and

**Table 1:** Survey Questions.

At your institution, is alcohol (intravenous and/or oral) ordered for inpatients at risk for alcohol withdrawal?
What is the goal of alcohol provision to inpatients with a recent history of high alcohol consumption?
Does your institution have a policy or protocol for patient selection and administration of alcohol?
What type(s) of alcohol are available:
Which department(s) is/are responsible for dispensing alcoholic beverages?
Among patients who are at risk of alcohol withdrawal, to the best of your knowledge, approximately what percentage of these patients are given alcohol?
To the best of your knowledge, what service most commonly orders alcoholic beverages for inpatients?
Why would alcohol be used over benzodiazepines in your institution?
What is the reason for not providing alcohol to patients at risk for alcohol withdrawal?

Table 2: Ethanol Administration survey results.	
Question	Results (%)
<b>Alcohol Provided at Institution</b>	
Yes	31(35.2%)
No	57(64.8%)
<b>Goal of Ethanol Provision</b>	
Prevention of Withdrawal	14 (45.16%)
Treatment of Withdrawal	0
Both Prevention and Treatment	16 (51.6%)
Unsure	1 (3.2%)
<b>Protocol for Patient Selection and Administration</b>	
Yes	7 (22.5%)
No	23 (74.19%)
Unsure	1 (3.2%)
<b>Types of Ethanol Available</b>	
	% (n)
Beer	26 (83.8%)
Wine	10 (32.2%)
Hard Liquor	18 (58.0%)
Intravenous Ethanol	4 (12.9%)
Unsure	2 (6.4%)
<b>Department Responsible for Procurement and dispensing</b>	
Pharmacy Department	23 (74.19%)
Food Services Department	4 (12.9%)
Both	4 (12.9%)
<b>Percentage of patients at risk who received ethanol for treatment/prevention</b>	
<10%	24 (77.4%)
>10%	5 (16.1%)
Unsure	2 (6.4%)
<b>Service that most commonly ordered ethanol</b>	
Medicine	15 (48.3%)
Surgery	13 (41.9%)
Burn	2 (6.4%)
Other (Psych, ENT etc...)	3 (9.6%)
Unsure	4 (12.9%)
<b>Reasons for using alcohol over benzodiazepines</b>	
Shorten length of stay	4 (12.9%)
To avoid complications of withdrawal	6 (19.35%)
Efficacy of ethanol is better	0
In order to avoid additional substance abuse	3 (9.6%)
Provider Preference	13 (41.9%)
Patient Preference	9 (29.0%)
Other	1 (3.2%)
Unsure	2 (6.4%)
<b>Reasons for NOT providing alcohol to patients at risk for withdrawal</b>	
Clinical Concerns	14 (24.56%)
Ethical Concerns	6 (10.5%)
Both Clinical and Ethical Concerns	20 (35.08%)
Other (No liquor license, never been asked)	3 (5.26%)

decreased N-methyl-D-aspartate (NMDA) receptor response. Chronic ethanol abuse causes physiological changes at these receptors. Consequently, uninhibited neurologic excitation and AWS symptoms occur following abrupt cessation of ethanol consumption [16].

When compared to non-ethanol dependent patients, ethanol dependent patients have increased morbidity and mortality while hospitalized [8,17,18]. These patients experience increased morbidity and mortality due to greater instances of sepsis, organ failure and pneumonia resulting in increased duration of mechanical ventilation, intensive care unit stay, and hospital days [17,18]. If left untreated AWS can progress to delirium tremens which has a mortality rate of up to 5% [19]. Benzodiazepines constitute first line therapy for AWS; no current guidelines recommend ethanol use for AWS [8,10,11]. No respondents in our survey stated that ethanol was dispensed to patients due to its superior efficacy for treatment of AWS.

Several research groups have suggested that use of an ethanol administration protocol reduced length of treatment, failure rate and increased referrals to a substance abuse clinic [12]. In spite of this evidence, 74% of institutions we surveyed did not have a protocol or guideline for ethanol therapy, which is consistent with similar findings from previous studies [20].

There are pharmacological concerns regarding ethanol administration. Ethanol has a short duration of action and a narrow therapeutic window leading others to suggest blood ethanol monitoring to reduce side effects while maintaining effectiveness [21]. Hepatic impairment and drug-drug interactions are also concerns with ethanol administration. Ethanol also facilitates physiological and psychological dependence. Continuing to administer ethanol to dependent patients while they are admitted to a hospital conveys a mistaken impression, legitimizing ethanol consumption for a medical purpose. This could spur continued ethanol abuse and avoidance of proper treatment, which may lead to further hospitalization and a reduced quality of life.

Our study is not without its limitations. While our intention was to survey a diverse range of clinicians (physicians, clinical dietitians, and clinical pharmacists) we surveyed mostly clinical pharmacists because they were most readily accessible by phone during business hours. While we intended to communicate exclusively with clinical staff possessing direct knowledge of ethanol use at each institution, this was effected via self-identification. Speaking to a single individual at each institution could potentially introduce subjectivity to some survey responses. Another limitation of this study was that we neglected to include clinicians with expertise in addiction management in the development of this survey or as survey responders. While the intent of this survey was to understand the prevalence of ethanol use we acknowledge that clinicians who specialize in this area could enhance future survey development. Further studies could include objective measures such as prescribing data. While our survey had a high response rate (75.2%) we were not able to reach all institutions and we surveyed only academic medical centers and thus this is not a true representation of all medical centers throughout the United States.

## CONCLUSION

Our study revealed that despite lack of established guidelines over one-third of surveyed academic medical centers in the United States dispensed ethanol to patients for prevention and/or treatment of AWS. Many do so without an institutional protocol, guideline or policy which could lead to inappropriate patient

selection, dosing and duration of therapy. Individual institutions should revisit their ethanol utilization for the prevention and/or treatment of AWS using current evidence based guidelines. Furthermore, institutions that use ethanol for AWS may reduce patient risk by developing a thoughtful, standardized ethanol administration protocol and allow the pharmacy department to control the procurement, storage and distribution of the medication.

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