Alcohol Use & Abuse in Ill & Injured Patients: Don't Be Fooled

Christine Schulman, RN, MS, CNS, CCRN
Critical Care & Trauma CNS
Legacy Health
Portland, Oregon
Director, Treasurer AACN

Challenges for health care providers

- Mask Signs & Symptoms of underlying problems
- Alters drug metabolism & interactions
- Complicates recovery from critical illness or injury

Special Patient Populations

- Trauma
- Elderly
- Pediatric

Basic Physiology

- Absorption site
  - Mouth & esophagus: small amounts
  - Stomach & large bowel: modest amounts
  - Proximal small intestine (major site)
- Rate
  - Rapid gastric emptying (carbonated drinks)
  - Absence of proteins, fats, or carbohydrates
  - Absence of additive ingredients for taste
  - Dilution

Average drink in US contains 12 g ETOH
- 12 oz beer
- 5 oz wine
- 1.5 oz of 80-proof hard liquor

National Institute of Alcoholism & Alcohol Abuse Recommendations
- Men: no more than 14 drinks/week or more than 4 on any given occasion
- Women: no more than 7 drinks per week, 3 on any given occasion

Significant Blood Levels

- Legal BA 80 mg/dl (.08)
- Metabolism Rate 12-50 mg/hr
- Apnea & Coma > 400 mg/dl
Effects of Blood Alcohol Levels

- 50 mg/dl
  - Difficulties with balance, impaired concentration, decreasing awareness of stimuli

- 100-150 mg/dl
  - Marked decline of cognitive & motor functioning, ataxia, slurred speech, impaired short-term memory and judgement

- 200 mg/dl
  - Unresponsive to stimuli

- 250 mg/dl
  - Loss of consciousness

Differential Diagnosis

- History/Mechanism of Injury
- BA Level
- Differential diagnosis
  - Traumatic brain injury
  - Stroke
  - Seizure
  - Other drugs
  - Hypoxia, hypoglycemia, shock
  - Brain infections, tumors
- Diagnostics: CT, Labs

Physiologic Effects
Central Nervous System (Brain)

- Brain cell structure disruption
- Altered transmission of neurological signals
- Peripheral neuropathy
- Inadequate cerebral blood flow
- Decrease in brain mass
- Sleep disturbances, psychoses, loss of memory & motor control

Physiologic Effects - CV

- Catecholamine surge (acute)
- Dysrhythmias (acute)
- Vasomotor depression (acute)
- Decreased cardiac output
- Mitochondrial damage

Alcoholic Cardiomyopathy

- 2nd leading cause of cardiomyopathy
  - 8-21 drinks/day for 5-16 years
- Men: onset @ age 38-44, more common, higher mortality
- Women: 45-50 years, better functional status
- Outcomes related to presence of other conditions

- Structural changes in the heart
  - Loss of cardiac cells due to apoptosis
  - Enlarged, dilated heart
  - Thin walls
  - Poor contractile strength
Physiologic Effects - Respiratory
- Decreased respiratory drive (acute)
- Increased risk of aspiration (acute)
- Increased risk of pneumonia & ARDS
- Drug interactions potentiate respiratory depression

Physiologic Effects - GI
- Loss of plasma proteins
- Flattened villi
- Decreased enzyme production
- Altered amino acid & glucose transport
- Exacerbation of other GI problems

Physiologic Effects - Liver
- Damage to cell structure & function
- Depletes vitamins & trace elements
- Accumulation of toxins & carcinogens
- Fat accumulation, necrosis, fibrosis
- Major pathologic consequences
  - Cirrhosis
  - Abnormal glucose metabolism
  - Bleeding
  - Vulnerability to infection
  - Malnutrition

Physiologic Effects - Fluid Balance
- Diuresis (acute)
- Water intoxication (acute & chronic)
- Electrolyte imbalances (acute & chronic)
- Acidosis (chronic)

Potential Risks for Alcoholic in the ICU
- Tissue hypoxia
- Cardiac failure
- Overwhelming sepsis
- Shock
- Hemorrhage
- Thromboembolism

Withdrawal Syndromes
- Nearly all patients will undergo WD
- Only 5% will develop severe WD problems
- DTs have 15-20% mortality
- Severity of sx dependent on drinking pattern and metabolic rate
Withdrawal Syndromes

- Early or minor
- Alcoholic Hallucinosis
- Alcoholic Seizures
- Delirium Tremens

Complications of DTs

- Volume depletion
- Electrolyte imbalance
- Acute rhabdomyolysis
- Dysrhythmias
- Lactic acidosis
- Ketoacidosis
- Systolic hypertension
- GI problems
- Sepsis

Prevention of DTs

- Determine risk based on history
- CIWA Scale to assess symptoms
- Aggressive benzodiazepine use
  - Valium up to 100 mg IV push
  - Ativan

CIWA-Ar

- Scores 0-67 (includes HR & BP but doesn’t score them)
  - Mild: ≤ 8
  - Moderate 9-17
  - Severe 18-67
- Does not account for lack of cognitive participation by patient (ventilated patient)

Risk Stratification

Class 1
- CIWA < 9
- No signs of withdrawal
- No acute processes
- No history of withdrawal
- No restraints

Acute Care

Class 2
- CIWA > 18
- Acute processes
- Hemodynamic instability
- Fluid & electrolyte imbalances
- Suspected rhabdo
- Sx of withdrawal despite elevated BAL

ICU

Academy of Medical-Surgical Nurses (AMSN) 24th Annual Convention (2015)
These materials were specially prepared for instructional use by AMSN and remain the property of AMSN and/or individual presenters. No portion of these materials, in whole or part, may be used in any fashion, or reproduced by any means, without the written permission of AMSN and/or individual presenters.
Risk Stratification

Class 3
Class 2 Criteria and
Documented hx of ETOH
withdrawal
Withdrawal is refractory
to treatment

ICU

Lorazepam Dosing

Diazepam Dosing

Results

Falls:
Average
13 (19 %) 14 (14 %) 5 (7 %)

Restraints:
Median days
6 days 2.5 days 1 day

Foley:
Median days
7 days 6 days 3 days

Ventilator:
Median days
9 days 2.5 days 2 days

Academy of Medical-Surgical Nurses (AMSN) 24th Annual Convention (2015)
These materials were specially prepared for instructional use by AMSN and remain the property of
AMSN and/or individual presenters. No portion of these materials, in whole or part, may be used in
any fashion, or reproduced by any means, without the written permission of AMSN and/or individual
presenters.
### Summary of SBIRT Studies in Trauma Patients

<table>
<thead>
<tr>
<th>Drinking</th>
<th>Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sommers (2006)</td>
<td>↓</td>
</tr>
<tr>
<td>Gentilello</td>
<td>↓</td>
</tr>
<tr>
<td>Longabaugh (2001)</td>
<td>↓</td>
</tr>
<tr>
<td>Monti (1999)</td>
<td>↓</td>
</tr>
<tr>
<td>Zatzick (2004)</td>
<td>↓</td>
</tr>
<tr>
<td>Soderstrom (2007)</td>
<td>↓</td>
</tr>
</tbody>
</table>

### Conclusions

1. Don’t trivialize the physiologic consequences of short & long term alcohol use
2. Carefully evaluate etiology of symptoms
3. Anticipate multisystem complications
4. Refer to rehab for immediate intervention

---

$\$ \text{Saved}$

- $1$ million saved in patient charges
- $360,000$ saved to Salmon Creek
- $2.5$ million saved in patient charges
- $895,000$ saved for Legacy

### Screening, Brief Intervention, & Referral for Treatment (SBIRT) (Schermer, 2006)

- Usual care: $22\%$ arrested for DUI
- 30-minute BI: $11\%$ arrested for DUI

50% reduction in DUI if BI performed

- One DUI prevented for every $9$ BIs performed.

Courtesy of C. Dunn, Harborview Medical Center

---

$\text{cschulma@lhs.org}$

*Academy of Medical-Surgical Nurses (AMSN) 24th Annual Convention (2015)*

These materials were specially prepared for instructional use by AMSN and remain the property of AMSN and/or individual presenters. No portion of these materials, in whole or part, may be used in any fashion, or reproduced by any means, without the written permission of AMSN and/or individual presenters.