

# Alcohol and head injury: A continuing dilemma

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## Case presentation

A 44-year-old male presents to an urban emergency department (ED) after falling down 12 stairs. He was found by friends, in bed with a scalp laceration and another pool of blood at the foot of the stairs. Patient history included frequent alcohol ingestion. At the time of presentation, the patient smelled of liquor. The scalp laceration was sutured, and the patient was discharged home. Two days later, the patient presents to an urgent care facility with complaint of increased headache, event amnesia, balance disorder, photophobia and hyperacusis. No focal motor neurological deficits were noted on exam. Since the urgent care facility does not have a CT scanner, the patient was transferred to another urban ED for a CT scan of the head. The CT revealed a right parietal skull fracture and small subdural hematoma. After consultation with neurosurgery, the patient was admitted for observation for two days and again discharged home. He returned again to the urgent care facility five weeks later with post-concussive symptoms of continual headache and mood swings. He was again transferred to the urban ED for a follow-up CT scan.

This case raises a few issues. The one I will focus on is the strong connection between alcohol use and head trauma. Patients continue to “fall through the cracks” when it is assumed that their main problem is alcohol intoxication and the **possibility of more severe head injury is not adequately addressed**. There are a few practices that I would like to discuss.

## Careful initial assessment

A thorough history and physical exam are necessary with patients who are seemingly “only intoxicated” (Marx, 2003). There may or may not be evidence of acute trauma. Patients need to be undressed and examined, as evidence of a fall or assault can otherwise be missed. Patients who habitually ingest alcohol may not be the best historians. The question of “recent trauma” should be extended to include the past several weeks and any friends or family of the patient in the history who may reveal additional traumatic incidents that the patient may not remember.

Serial evaluations and the trending of assessment findings will help differentiate between ethanol intoxication and head injury. As blood ethanol levels decrease, level of consciousness should improve, speech should become clearer, and general motor power should increase. The trend of Glasgow Coma Scale scores will help illustrate these findings. The Glasgow Coma Scale is a simple tool to use and trend, yet does not replace a full neurological examination (Shepard, 2004).

## The question of blood ethanol levels

Not all EDs are able to obtain blood ethanol levels. When available, it is recommended that an initial blood ethanol level be known, with serial blood ethanol levels if there is a debate over the reason for a patient’s continued altered mentation or lack of improvement in level of consciousness.

Blood ethanol concentrations vary according to sex, size, body composition, previous exposure to ethanol, whether it is taken with food, and whether drugs that affect gastric emptying are used (Shepard, 2004). Ethanol is eliminated predominantly by liver metabolism at a rate of 15 mg/100 ml per hour. Metabolism is accelerated in heavy drinkers unless they have liver damage, when it may fall to less than a quarter of normal (Shepard). So, the bottom line is that patients should sober up over time spent in the ED, and any delays should be further investigated. There are many possible explanations for patients with a decreased level of consciousness. Table One lists the differential diagnosis for altered mentation.

## The question of CT head for all intoxicated patients

A head CT is not available in all EDs at all times. Many intoxicated patients with a questionable or suggestive history of trauma will receive a CT scan if available. The question becomes whether to transfer an intoxicated patient for a CT head.

Physicians can refer to the Canadian CT Head Rule (Paton, 1994). One study reported a sensitivity of 100% for detecting abnormal CT scans in head injured patients with any one of seven findings: headache, vomiting, age >60 years, drug or alcohol intoxication, deficits in short-term memory, physical

**Table One: Differential diagnosis for altered mentation** (Marx, 2003)

Traumatic	Metabolic	Toxicologic	Infectious	Neurologic
Intracranial hemorrhage	Hypoglycemia	Other alcohols	Meningitis Meningoencephalitis	Postictal state
Hypotension secondary to hemorrhage	Hepatic encephalopathy	Other toxins	Brain abscess	Alcohol withdrawal
	Hypoxia	Disulfiram (Antabuse®)-ethanol reaction	Sepsis	Wernicke-Korsakoff syndrome

evidence of trauma above the clavicles, and seizure (Jin & Bullard, 2002). Strict following of this rule would then indicate the need for a CT scan of an intoxicated patient.

## Final point

Patients who ingest ethanol are at risk for minor, moderate and severe head trauma. Most people presenting with mild head injuries will not have any progression. However, up to three per cent of mild head injuries progress to more serious injuries (Shepard, 2004). ED staff must continue to have a high index of suspicion for concomitant trauma in patients who present with intoxication.

## References

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Shepard, S. (2004). *Head Trauma*. Retrieved March 9, 2006, from <http://www.emedicine.com/med/topic2820.htm>

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## Additional information/ Resources on alcohol use and trauma

The Centre for Disease Control and Injury Prevention in the U.S. has announced that *The Journal of Trauma: Injury, Infection & Critical Care* has recently published a special

issue of proceedings from the groundbreaking conference, "Alcohol and Other Drug Problems among Hospitalized Trauma Patients: Controlling Complications, Mortality, and Trauma Recidivism." In 2003, the CDC's Injury Center convened this interdisciplinary meeting of government organizations, trauma surgeons, advocates, and substance-use treatment researchers. The proceedings discuss recent studies and recommendations for implementation of brief screening and intervention strategies within the emergency and trauma care settings for patients who might have drug or alcohol problems.

Trauma surgeons, nurses, addiction counsellors, psychologists, public health officials and others on the front lines of trauma care will find this special supplement essential for developing interventions to prevent injury caused by alcohol and drug-related problems.

### Website

[http://www.cdc.gov/ncipc/pub-res/alcohol\\_proceedings/alcohol\\_proceedings.htm](http://www.cdc.gov/ncipc/pub-res/alcohol_proceedings/alcohol_proceedings.htm)

You can view or download sections of the supplement at <http://www.cdc.gov/ncipc/Spotlight?JrnTraumaSupl.htm>

E-mail any questions or comments to [ncipcdirinto@cec.gov](mailto:ncipcdirinto@cec.gov), and type "Trauma/Substance Use" in the subject line of your message.

"Alcohol, Trauma and Impaired Driving, 3rd Edition" document released through The Centre for Addiction and Mental Health and MADD. The 3rd edition is more comprehensive and has more international research to place the Canadian experience of impaired driving and alcohol-related trauma into context. The document is intended as a resource for health care researchers, lawmakers, media and anyone interested in current trends on alcohol-related trauma.

Access this document at [http://www.madd.ca/english/research/real\\_facts.pdf](http://www.madd.ca/english/research/real_facts.pdf) or through the MADD web site: [www.madd.ca](http://www.madd.ca)

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