Introduction to *Alcohol Blackouts* / *Alcohol Amnesia*

Alcohol Blackouts are a frequently occurring phenomenon.
"Blackouts are much more common among social drinkers – including college students – than was previously assumed and have been found to encompass events ranging from conversations to intercourse." (White, 2003, p. 186)

- Thirty-five percent of trainees in a pediatric residency program had experienced at least one blackout. (Knight 1999)
- Thirty-three percent of first-year medical students had at least one blackout. (Goodwin 1995)
- A large study in Finland revealed 35% of males had experienced at least one blackout. (Poikolainen 1982)
- Fifty-one percent of college students who had ever drank alcohol reported blacking out at some point in their lives and 40% reported blacking out in the previous year. (White 2002)

Alcohol - Induced Blackouts (White, 2003)
In his seminal 2003 article, Aaron White notes:
Alcohol primarily interferes with the ability to form new long-term memories, leaving intact previously established long-term memories and the ability to keep new information active in memory for brief periods. As the amount of alcohol consumed increases, so does the magnitude of the memory impairments. Large amounts of alcohol, particularly if consumed rapidly, can produce partial (i.e., fragmentary) or complete (i.e., en bloc) blackouts, which are periods of memory loss for events that transpired while a person was drinking. Blackouts are much more common among social drinkers--including college drinkers--than was previously assumed, and have been found to encompass events ranging from conversations to intercourse. Mechanisms underlying alcohol-induced memory impairments include disruption of activity in the hippocampus, a brain region that plays a central role in the formation of new autobiographical memories

If recreational drugs were tools, alcohol would be a sledgehammer. Few cognitive functions or behaviors escape the impact of alcohol, a fact that has long been recognized in the literature. As Fleming stated nearly 70 years ago, "the striking and inescapable impression one gets from a review of acute alcoholic intoxication is of the almost infinite diversity of symptoms that may ensue from the action of this single toxic agent" (1935) (pp. 94–95). In addition to impairing balance, motor coordination, decisionmaking, and a litany of other functions, alcohol produces detectable memory impairments beginning after just one or two drinks. As the dose increases, so does the magnitude of the memory impairments. Under certain circumstances, alcohol can disrupt or completely block the ability to form memories for events that transpire while a person is intoxicated, a type of impairment known as a blackout. This article reviews what is currently known regarding the specific features of acute alcohol–induced memory dysfunction, particularly alcohol–induced blackouts, and the pharmacological mechanisms underlying them.

Aaron M. White, *What Happened? Alcohol, Memory Blackouts, and the Brain* (2003).
Alcohol Research & Health. 2003 Vol 27(2) p. 186

Blackouts represent episodes of amnesia, during which subjects are capable of participating even in salient, emotionally charged events - as well as more mundane events - that they later cannot remember (Goodwin 1995). Like milder alcohol–induced memory impairments, these periods of amnesia are primarily "anterograde," meaning that alcohol impairs the ability to form new memories while the person is intoxicated, but does not typically erase memories formed before intoxication. Formal research into the nature of alcohol–induced blackouts began in the 1940s with the work of E.M. Jellinek (1946). Jellinek's initial characterization of blackouts was based on data

collected from a survey of Alcoholics Anonymous members. Noting that recovering alcoholics frequently reported having experienced alcohol–induced amnesia while they were drinking, Jellinek concluded that the occurrence of blackouts is a powerful indicator of alcoholism.

In 1969, Goodwin and colleagues published two of the most influential studies in the literature on blackouts (Goodwin et al. 1969a,b). Based on interviews with 100 hospitalized alcoholics, 64 of whom had a history of blackouts, the authors posited the existence of two qualitatively different types of blackouts: en bloc and fragmentary blackouts. People experiencing en bloc blackouts are unable to recall any details whatsoever from events that occurred while they were intoxicated, despite all efforts by the drinkers or others to cue recall. Referring back to our general model of memory formation, it is as if the process of transferring information from short–term to long–term storage has been completely blocked. En bloc memory impairments tend to have a distinct onset. It is usually less clear when these blackouts end because people typically fall asleep before they are over. Interestingly, people appear able to keep information active in short–term memory for at least a few seconds. As a result, they can often carry on conversations, drive automobiles, and engage in other complicated behaviors. Information pertaining to these events is simply not transferred into long–term storage. Ryback (1970) wrote that intoxicated subjects in one of his studies "could carry on conversations during the amnesic state, but could not remember what they said or did 5 minutes earlier. Their immediate and remote memory were intact" (p. 1003). Similarly, in their study of memory impairments in intoxicated alcoholics, Goodwin and colleagues (1970) reported that subjects who experienced blackouts for testing sessions showed intact memory for up to 2 minutes while the sessions were taking place.

Unlike en bloc blackouts, fragmentary blackouts involve partial blocking of memory formation for events that occurred while the person was intoxicated. Goodwin and colleagues (1969a) reported that subjects experiencing fragmentary blackouts often become aware that they are missing pieces of events only after being reminded that the events occurred. Interestingly, these reminders trigger at least some recall of the initially missing information. Research suggests that fragmentary blackouts are far more common than those of the en bloc variety (White et al. 2004; Hartzler and Fromme 2003b; Goodwin et al. 1969b).

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