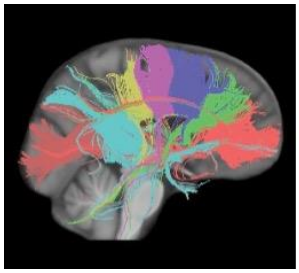
National Institute on Alcohol Abuse and Alcoholism

NIAAA Resources on Alcohol and the Brain

Alcohol interferes with the brain's communication pathways and can affect the way the brain functions. In the brain, alcohol exerts its effects by interacting with numerous neurotransmitters and their receptors, with different neurotransmitters producing different behavioral effects of alcohol. Alcohol misuse makes it harder for the brain areas controlling balance, memory, speech, and judgment to do their jobs, resulting in a higher likelihood of injuries and other negative outcomes.

Below are brief descriptions and links to National Institute on Alcohol Abuse and Alcoholism factsheets about the various effects that alcohol misuse has on the brain.



Diffusion tensor imaging (DTI) of fiber tracks in the brain of a 58-year-old man with alcohol use disorder. DTI maps white-matter pathways in a living brain. Image courtesy of Drs. Adolf Pfefferbaum and Edith V. Sullivan.

Alcohol and the adolescent brain

The developing brain is particularly vulnerable to the effects of alcohol. Misuse of alcohol during adolescence and early adulthood can alter the trajectory of brain development, resulting in long-lasting changes in brain structure and function.

Alcohol-induced blackouts

One significant consequence of alcohol misuse is alcohol-induced blackouts.
Blackouts are gaps in a person's memory for events that occurred while they were intoxicated. These gaps happen when a person drinks enough alcohol to temporarily block the transfer of memories from short-term to long-term storage—known as memory consolidation—in a brain area called the hippocampus.

Alcohol overdose

Continuing to drink despite clear signs of significant impairment can result in an alcohol overdose. An alcohol overdose occurs when there is so much alcohol in the bloodstream that areas of the brain controlling basic life-support functions begin to shut down and can even lead to permanent brain damage or death.

The cycle of alcohol addiction

As individuals continue to drink alcohol over time, progressive changes may occur in the structure and function of their brains. These changes can compromise brain function and drive the transition from controlled, occasional use to chronic misuse, which can be difficult to control and lead to alcohol use disorder (AUD). Individuals with moderate to severe AUD may enter a cycle of alcohol addiction.

Wernicke-Korsakoff syndrome

Wernicke-Korsakoff (WK) syndrome is a serious brain condition that is usually, but not exclusively, associated with chronic alcohol misuse and severe AUD. WK syndrome involves two different brain disorders that result from brain damage associated with AUD combined with vitamin B1 (thiamine) deficiency.

For more information on alcohol's effects on the brain and other parts of the body, please visit:
https://www.niaaa.nih.gov/alcohols-effects-health/alcohols-effects-body