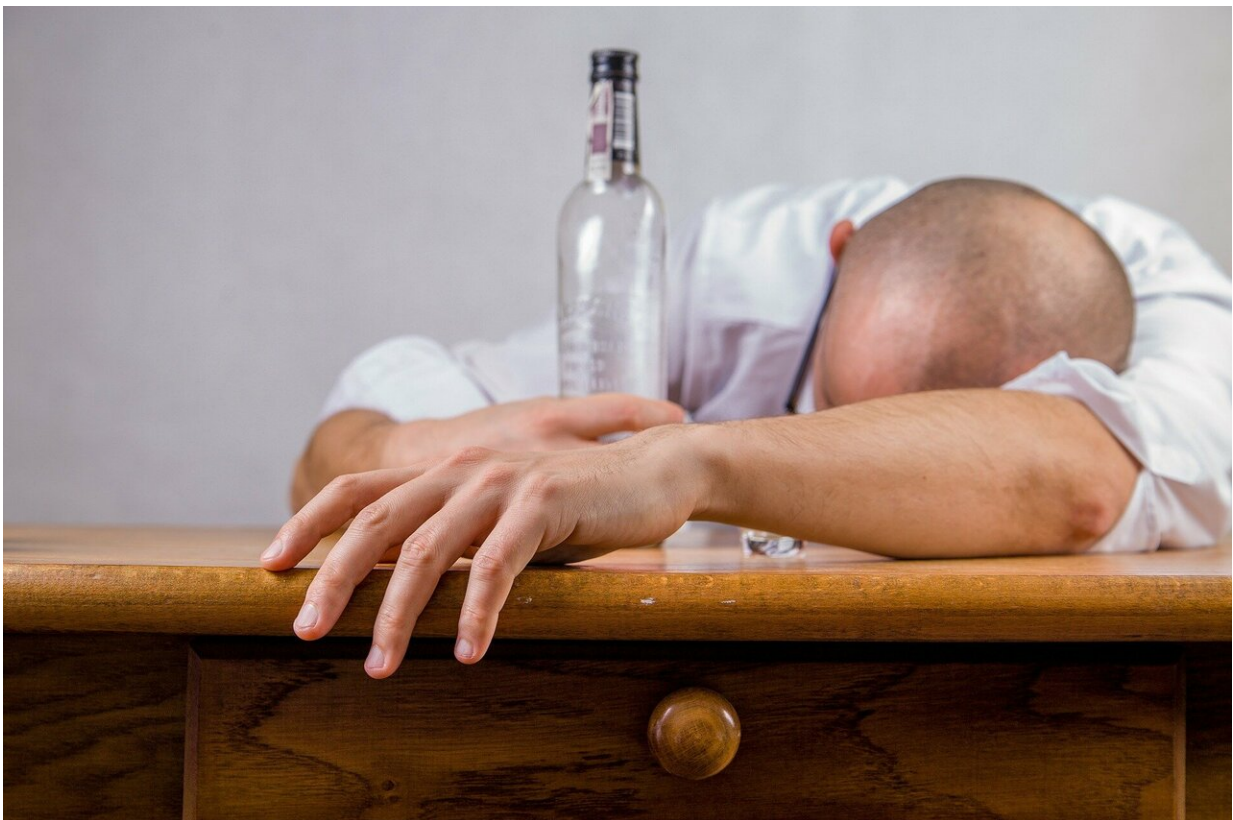


# Recovery from alcohol use disorder: Long-term abstinence accompanied by brain changes and emotional improvements

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Interlinked changes in drinking behavior, mood, and the brain among women and men during recovery from alcohol use disorder (AUD) have

been clarified in a new study in *Alcoholism: Clinical and Experimental Research*. AUD recovery was already known to be multidimensional, with behavioral changes—ranging from stopping heavy drinking to complete abstinence—accompanied by partial reversal of alcohol-induced brain damage. While the relationship between early abstinence (the "withdrawal phase"), negative mood, and sex-specific effects of alcohol on the brain's "reward system" have been well-established, a growing body of evidence is revealing that AUD individuals in long-term abstinence (greater than five years) report higher levels of subjective happiness and emotional well-being, as well as a significantly lower risk of relapse. Yet, the way these long-term behavioral and emotional improvements relate to underlying brain changes, and potentially differ between men and women, remains unknown. To better understand and characterize these aspects of the recovery process, the study's researchers examined the associations between the duration of abstinence, emotional states, and structural measures of brain regions involved in emotional processing, among abstinent men and women with AUD.

The study involved sixty people from the Boston area with a clinical diagnosis of AUD, and a history of five or more years of heavy drinking, who had abstained from alcohol for at least 4 weeks. Among this group, duration of [abstinence](#) ranged from 4 weeks to 38 years (average 6 years). An additional sixty people without AUD were recruited as controls. All participants underwent a series of structured interviews for detailed information on their drinking history, duration of abstinence (as a measure of recovery-related behavior), and mood, and had MRI scans from which the size (volume) of specific subregions of the [brain](#) reward system could be measured. The researchers used statistical modeling to compare brain region volumes and mood states among short- to mid-term abstainers (abstinent for less than five years), long-term abstainers (abstinent for at least 5 years), and controls. Differences between men and women were explored, and all analyses were adjusted for

differences in age, education, drinking severity, and verbal IQ. People with moderate-to-severe depression were excluded.

The researchers found that, compared to the control group, the short- to mid-term abstainers exhibited lower positive mood and higher [negative mood](#), both of which appeared to be related to structural differences of brain regions involved in pain processing and social emotions. In contrast, relative to the control group, long-term abstainers exhibited more normative mood profiles, with the exception of higher levels of depression, in conjunction with their own distinctive neural profile. The researchers also found significant differences between AUD men and AUD women with varying durations of abstinence. Relative to men with AUD, women with AUD had significantly larger volumes of certain brain subregions, as well as greater positive mood scores for a given duration of abstinence, extending previous evidence for sex differences in the effects of AUD and in brain structure and function during recovery.

The findings from this study suggest that, for individuals in recovery from AUD, abstinence itself may represent its own type of behavioral intervention for changing the brain and, ultimately, changing the negative moods and emotions that frequently lead to relapse. Additionally, these findings indicate that, for both men and women in early abstinence, [negative feelings](#) need not be interpreted as negative feedback, such that emotional discomfort represents something going "wrong" in recovery. Rather, such feelings may be successfully anticipated and accommodated as necessary pathways to sustained remission and well-being. Research into changes within individuals over time will be needed to substantiate the findings and their clinical relevance.

**More information:** Benjamin L. Thompson et al, Brain, behavioral, affective, and sex correlates of recovery from alcohol use disorders,

*Alcoholism: Clinical and Experimental Research* (2021). [DOI: 10.1111/acer.14658](https://doi.org/10.1111/acer.14658)

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