

# Smoking interferes with neurocognitive recovery during abstinence from alcohol

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Numerous studies have shown that individuals with an alcohol use disorder perform worse than those without one on multiple neurocognitive domains of function following detoxification from alcohol, although the level of impairment can vary widely among individuals. A new study of the degree of neurocognitive recovery in treatment-seeking alcohol dependent individuals (ALC) – with varied degrees of smoking status – during the first eight months of sustained abstinence from alcohol has found that smoking status influenced the rate and level of recovery.

Results will be published in the November 2014 online-only issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"There have been few longitudinal studies that have specifically studied the effects of cigarette smoking on cognitive recovery in ALC during abstinence," said Timothy C. Durazzo, associate professor in the department of radiology and biomedical imaging at the University of California San Francisco, and corresponding author for the study. "To our knowledge, there have been no previous studies that used multiple assessment points to investigate the effects of cigarette smoking on cognitive recovery over the first eight months of abstinence from alcohol. We chose to examine measures of processing speed, learning and memory, and working memory because these abilities have been shown to be adversely affected by alcohol use disorders as well as chronic cigarette smoking."

Durazzo and his colleagues examined a total of 133 ALC participants – 30 had never smoked, 28 were former smokers, and 75 were active smokers – as well as 39 never-smoking "control" participants.

Approximately 89 percent of the participants were male. All of the participants were given standardized measures of auditory-verbal and visuospatial learning and memory, processing speed, and working memory. Assessments after one week, four weeks, and eight months of abstinence for the ALC group allowed a comparison of the rates of neurocognitive changes from one to four weeks versus one to eight months of abstinence. The controls completed a baseline assessment and a follow-up approximately nine months later.

"We found that, overall, the ALC as a group showed the greatest rate of recovery on most abilities during the first month of abstinence," said Durazzo. "Over eight months of sustained abstinence from alcohol, active-smoking ALC showed poorer recovery than never-smoking ALC on measures of learning, and both former-smoking ALC and active-smoking ALC recovered less than never-smoking ALC on processing speed measures. In addition, after eight months of abstinence, active-smoking ALC performed worse than both controls and never-smoking ALC on most measures, former-smoking ALC performed worse than never-smoking ALC on several tests, but never-smoking ALC were not different from controls on any measure. Overall, the findings indicated never-smoking ALC showed full recovery on all measures after 8 months of sustained abstinence from alcohol."

"What this new research has found is that cognitive improvements are not uniform across alcoholic patients in recovery," explained David A. Kareken, deputy director of the Indiana Alcohol Research Center, and professor in the department of neurology at Indiana University School of Medicine. "In particular, some of this variability in cognitive recovery is explained by smoking. That is, those who stopped drinking, yet continued to smoke – or even smoked in the past – were slower to

recover some types of mental skills over a period of months as compared to those who never smoked. This was most evident in skills such as visual memory, attention, and the capacity to quickly perform motor tasks that require directed, focused mental activity."

Durazzo said he was somewhat surprised by the degree of recovery. "The average alcohol consumption for the never-smoking ALC participants was about 370 drinks per month during the year prior to study," he said. "This suggests that significant cognitive recovery is possible during sustained abstinence from alcohol."

Both Durazzo and Kareken commented on the damaging toxicity of [cigarette smoke](#).

"Cigarette smoke contains a tremendous number of toxic compounds that affect multiple organs in the body, including the brain," said Durazzo. "The components of cigarette smoke can promote significant oxidative stress in the lungs, blood vessels, and brain in humans. Oxidative stress is caused by 'free radicals' that directly damage the various cells that constitute the brain, which may lead to impaired function; the human brain is highly vulnerable to oxidative stress. The active-smoking ALC stopped drinking, but continued to smoke, which may have damped their recovery because of continued exposure to the various chemicals in cigarette smoke that promote oxidative stress. The diminished recovery of former-smoking ALC may represent the residual effects of long-term oxidative stress; however, this is all speculative."

Kareken agreed. "What precisely it is about smoking that causes alcoholic patients to recover cognitive abilities more slowly is uncertain, as smoking involves much more than delivering a drug," he said. "Certainly, nicotine can acutely stimulate attention and mental abilities, which is one reason why many people find smoking to be reinforcing. However, smoking also involves the delivery of a very large number of

toxins and gasses that ... may also interact with how alcohol damages the brain. Smoking could affect the brain indirectly, as well, by damaging other organs that interact with the brain, such as the heart and lungs. Teasing apart the precise effects will be complex."

"Our findings stress the importance of evaluating the influence of conditions/behaviors that often accompany alcohol use disorders, such as cigarette smoking, to better understand the factors that may hinder cognitive recovery during abstinence from alcohol," said Durazzo. "The frequency of cigarette smoking is much higher in those with alcohol and substance use disorders compared to the general public. It is important to emphasize that cigarette smoking alone is associated with adverse effects on multiple areas of cognitive function, such as learning and memory and processing speed. And, just like alcohol use disorders, cigarette smoking and nicotine dependence are treatable conditions. We believe our findings strongly reinforce the growing clinical movement to offer a comprehensive smoking-cessation program to individuals seeking treatment for [alcohol](#) and substance use disorders."

Provided by Alcoholism: Clinical & Experimental Research

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