

Breathing problems linked to drug that treats opioid addiction

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A drug used to treat opioid addiction could cause breathing problems in some obese patients, according to a new study from UT scientists.

Buprenorphine is a Schedule III [drug](#) with a lower abuse potential than methadone. It is one of three drugs approved by the US Food and Drug Administration to help patients undergoing treatment for [opioid abuse](#). The UT study found that the drug impairs the ability of [obese mice](#) to vary their breathing. These findings in mice may encourage similar studies in humans, since the ability to vary breathing helps us achieve tasks such as climbing stairs and respond to challenges such as disease and surgical stress.

The discovery of the drug's previously unknown side effect could help clinicians improve patient care, said the study's lead author, Ralph Lydic, Robert H. Cole Endowed Professor of Neuroscience in the UT Department of Psychology and the Department of Anesthesiology at UT Medical Center.

The results were published today in the Online First edition of *Anesthesiology*, the peer-reviewed medical journal of the American Society of Anesthesiologists. The research is supported by a grant from the National Heart, Lung, and Blood Institute of the National Institutes of Health.

The study comes at a time when state and federal officials are grappling with ways to combat the nation's growing opioid abuse epidemic. A

recent study from the Appalachian Regional Commission, a federal economic development agency, showed that opioid abuse in Appalachia was greater and growing at a faster rate than in the rest of the country.

Lydic and researcher partner Helen A. Baghdoyan, UT professor of psychology and professor in the Department of Anesthesiology at UT Medical Center, along with a team of scientists from UT and UT Medical Center, studied both mice of normal weight and obese mice. The results show that buprenorphine impairs the ability to vary breathing.

Previous human studies report a greater risk for respiratory failure caused by opioids among obese female patients.

"Given the impressive similarity between mouse and human genes, the mouse data encourage studying the effects of buprenorphine on breathing variability in male and female obese humans," Lydic said.

The daunting challenge for clinical providers is to diminish pain and drug craving in addicted patients without causing respiratory depression, he said.

"Recovery from [opioid](#) addiction is very difficult and, in the most successful cases, can require two or more years," he said.

"Buprenorphine received FDA approval in 2002. Only now in 2018 we discover an unknown side effect in mice. The delay from 2002 to 2018 in discovering this effect of buprenorphine should help lay readers appreciate the need to support basic and clinical research."

As their next steps, Lydic and the team of scientists will conduct studies to determine the brain regions and neurotransmitters involved in [buprenorphine](#)'s depression of respiratory variability.

Provided by University of Tennessee at Knoxville

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