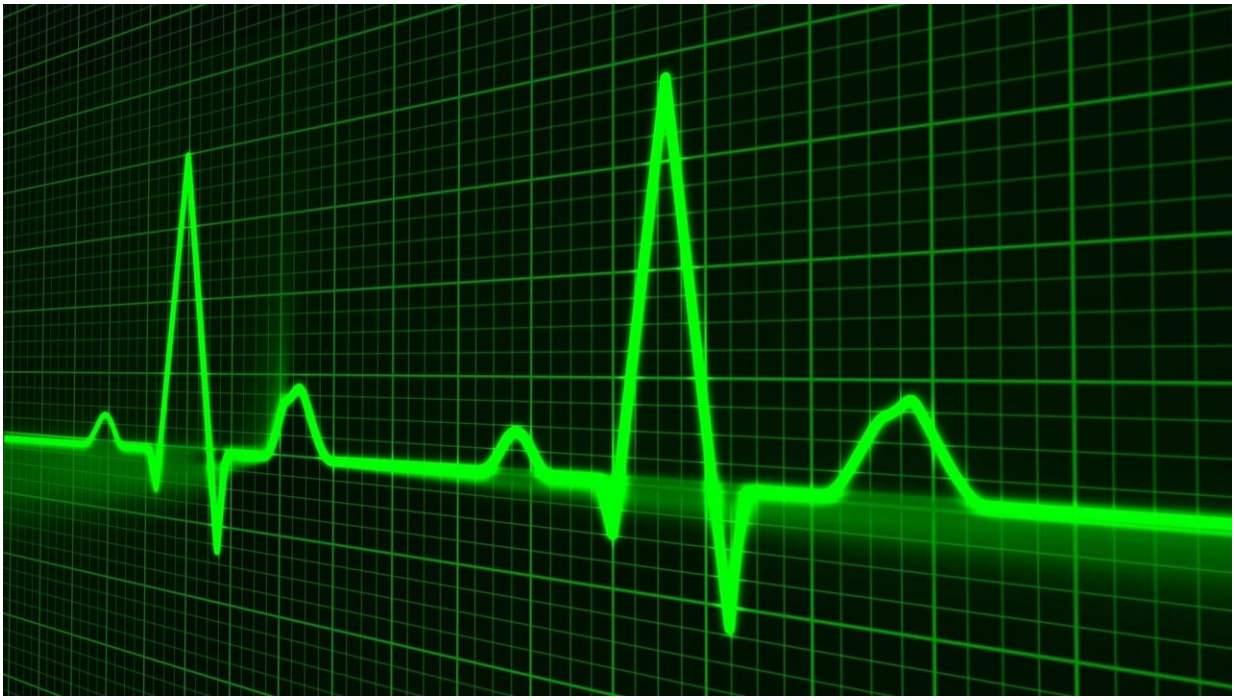
Guidance on sleep-disordered breathing and cardiac arrhythmias in adults

August 16 2022



Credit: Pixabay/CC0 Public Domain

A new scientific statement from the American Heart Association (AHA) provides important guidance about sleep-disordered breathing (SDB), an often undiagnosed but prevalent health problem, and its association with development of cardiac arrhythmia.

Published in *Circulation*, the comprehensive analysis was authored by a

panel led by Cleveland Clinic experts Reena Mehra, MD, MS, and Mina Chung, MD, as chair and vice chair, respectively. The statement provides data showing the potential value of how SDB treatment affects cardiac arrhythmias beneficially and thereby can improve patient outcomes.

Nearly 1 billion individuals worldwide suffer from SDB, characterized by alterations in breathing during sleep and associated with excessive cardiopulmonary morbidity. Studies have shown that the physiological stress of SDB has sustained biological effects, which alter the structure of the heart and increase risk for heart arrhythmias. In uncontrolled studies, treatment of SDB has been shown to reduce recurrence of arrhythmia after interventions such as catheter ablation and cardioversion for atrial fibrillation.

"Strong evidence indicates that sleep-disordered breathing can lead to severe health consequences, which can directly affect cardiac function," says Dr. Mehra, Director of Research in Cleveland Clinic's Sleep Disorders Center. "Our panel's data synthesis is designed to increase knowledge and awareness of the existing science in this area."

"The association of sleep apnea and obesity with atrial fibrillation has made identification and treatment of sleep-disordered breathing and weight loss an important part of lifestyle and risk factor reduction in the treatment of atrial fibrillation," adds Dr. Chung, staff cardiologist in the Section of Cardiac Pacing and Electrophysiology in Cleveland Clinic's Heart, Vascular & Thoracic Institute. She also chaired the 2020 AHA scientific statement on lifestyle and risk factor modification for reduction of atrial fibrillation.

The evidence for the scientific statement came from data reviews conducted by the author panel from large retrospective and prospective trials. The statement was peer reviewed by outside experts in

epidemiology and clinical, translational and experimental research focused on SDB or cardiac arrhythmias. The panel's findings are not formal clinical recommendations but rather considerations and suggestions for best clinical practice.

The panel's key conclusions include the following:

- Day-night patterning and circadian biology of SDB-induced consequences jointly influence the structural and electrophysiological structure of the heart, creating an ideal setting for cardiac arrhythmias to occur
- Cohort studies support strong associations between SDB and cardiac arrhythmia, providing evidence that discrete episodes of stopping breathing trigger atrial and ventricular arrhythmia events.
- Observational evidence suggests that treating SDB lessens AF recurrence after rhythm control interventions (such as ablation and cardioversion), but there is currently no high-level evidence from randomized trials supporting a role for SDB intervention in rhythm control.
- Opportunities exist to optimize SDB screening, characterize SDB predictive metrics and underlying pathophysiology, elucidate sex- and race/ethnicity-specific influences in SDB, assess the role of mobile health innovations, and prioritize conduct of rigorous and sufficiently powered clinical trials.

SDB subtypes relevant to the AHA document include obstructive sleep apnea (OSA), central sleep apnea (CSA), and CSA–Cheyne-Stokes breathing (CSB).

While noting that many observational studies suggest that treatment of SDB improves atrial fibrillation outcomes, the panel identifies confirmation of this association in randomized controlled trials as a

research priority. "Currently there are only small or limited randomized studies that have addressed SDB and atrial fibrillation, and they have shown conflicting results," Dr. Chung says.

"We definitely need adequately powered, rigorously designed randomized controlled trials to ascertain whether intervening in patients with SDB actually improves arrhythmia outcomes," Dr. Mehra adds. "The bulk of the data we have are for atrial fibrillation, and research is needed on other arrhythmias and on the impact of other factors, such as health disparities."

More information: Reena Mehra et al, Sleep-Disordered Breathing and Cardiac Arrhythmias in Adults: Mechanistic Insights and Clinical Implications: A Scientific Statement From the American Heart Association, *Circulation* (2022). DOI: 10.1161/CIR.0000000000001082

Provided by Cleveland Clinic