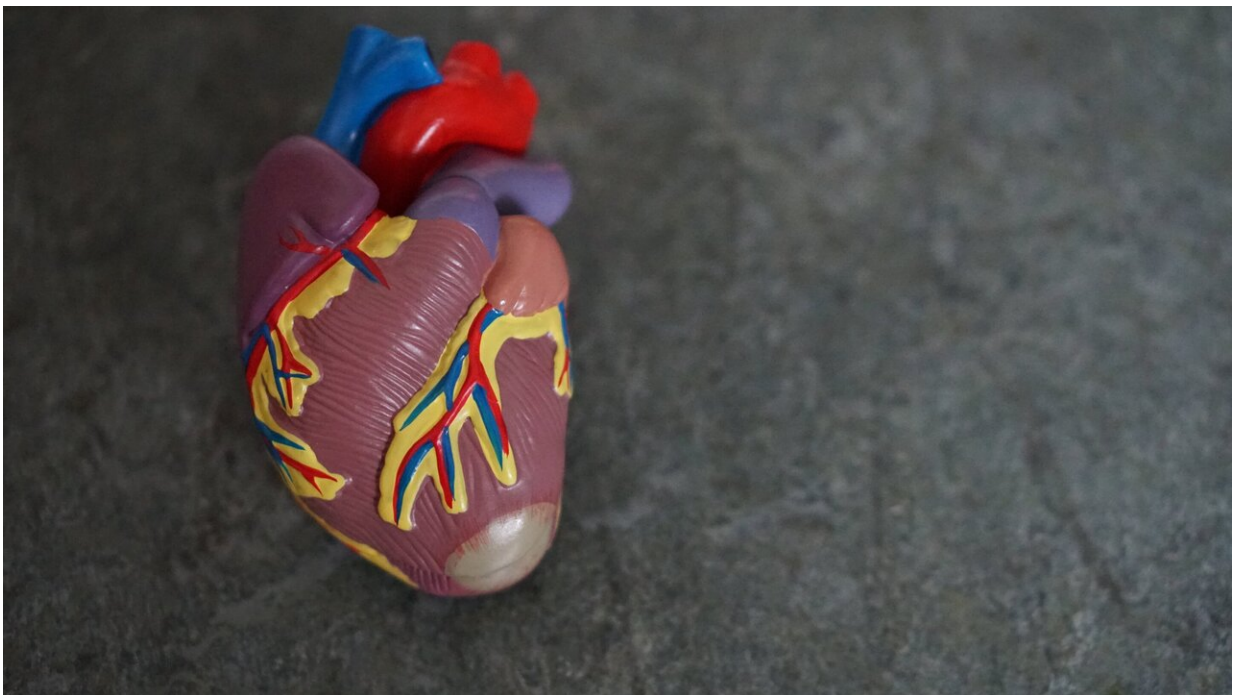


Advance planning can lower risks of high-altitude activities for people with heart disease

September 9 2021



Credit: Unsplash/CC0 Public Domain

People with high blood pressure, coronary artery disease, arrhythmias (heart rhythm abnormalities) or heart failure should check with their health care professional before visiting a high-altitude location, according to a new scientific statement from the American Heart

Association published in the *Journal of the American Heart Association*, an open access journal of the Association.

The scientific statement is a review of the latest research specifically examining risks associated with traveling to mountainous locations among individuals with [cardiovascular disease](#). The expert writing group for the statement detail appropriate management strategies for individuals with a history of [heart](#) disease when traveling to mountainous regions.

In mountainous regions—particularly altitudes of 9,840 to 16,400 feet above [sea level](#)—activities such as skiing, hiking, bicycling or climbing, place unique challenges on the heart and blood vessels due to lower levels of oxygen and fluctuations in air pressure, temperature and humidity. At high altitudes, the heart requires more oxygen-rich blood, even when at rest. Fainting is common, even at moderate altitudes—8,800 feet above sea level—and may occur within 24 hours of ascent, according to the statement.

"Many people and [health care professionals](#) are familiar with symptoms of acute mountain sickness like headaches, dizziness, nausea and weakness. However, they may be less aware of the stress placed on the body—and particularly the heart and lungs, when people with cardiovascular disease travel to mountainous regions where there is a reduction in oxygen availability compared to sea-level conditions. If people are not prepared, they may be at an increased risk of adverse events in these types of environments," said William K. Cornwell III, M.D., M.S.C.S., FAHA, chair of the scientific statement writing group and assistant professor of cardiology at the University of Colorado School of Medicine in Aurora, Colorado. "This concise overview of how altitude impacts patients with cardiovascular disease provides additional information to help guide clinicians in advising their patients on best practices for safe travel to higher altitudes and mountainous regions."

For people who live at high altitude, their body has adjusted to the effects of being at higher altitude. In the U.S., more than 100 million people travel to mountainous environments yearly for work or pleasure, and many of them are at-risk for or already have some form of cardiovascular disease. Medical centers that can provide advanced cardiac care may be limited in mountain regions, so understanding the unique physiologic challenges associated with exercising in low-oxygen environments and their impact on the heart is critical.

"A thorough assessment by a health care professional may be necessary before a mountain sojourn to assess risk and ensure that people with a history of heart disease safely enjoy physical activities in the mountains," Cornwell said. "Together with a health care professional, a plan should be developed before travel, bearing in mind the location and duration of travel, along with the severity of the individual's medical conditions. The plan should address these important questions: Is the patient's heart condition stable and under control? What is the emergency plan if something goes wrong? Do any medications need to be adjusted? Are there any additional medications needed in case of an emergency? Where is the closest hospital? Who should be called if the individual needs to be evacuated from a remote location?"

The statement defines low altitude as 1,640 to 6,560 feet above sea level, such as Denver, Colorado, which is 5,280 feet above sea level. Moderate altitude is categorized as 6,560 to 9,840 feet above sea level, such as Park City, Utah, which is 7,000 feet above sea level. High altitude is considered 9,840—16,400 feet, such as Mount Rainer, Washington, which is 14,411 feet above sea level; and extreme altitude is 16,400 feet or higher above sea level, such as the summit of Denali in Alaska, which is 20,310 feet above sea level.

Strategies for a safe trip to [high altitudes](#) may include:

- Increasing altitude gradually so the body has time to adjust to lower levels of oxygen.
- Drinking enough water and fluids to stay hydrated.
- Adjusting medications to reduce the likelihood of cardiovascular events, as directed by a medical professional.
- Working with a [health care](#) professional to determine if any additional medications may be needed to treat certain symptoms, especially if they occur while in a remote location.
- Limiting or avoiding alcohol.
- Identifying the symptoms that should prompt an emergency evacuation.
- Planning a gradual ascent and establishing emergency descent plans.
- Awareness of the closest hospitals.

Sudden cardiac death is the most frequent non-traumatic cause of death at altitude, according to the statement. It may occur without warning and result in death within minutes if the individual does not receive treatment. Risk factors for sudden cardiac death include history of a prior heart attack, as well as male sex and older age.

Sudden cardiac death can also be triggered by intense physical exertion, particularly if the body has not had time to adjust to altitude and inadequate fluid intake. Observational studies cited in the statement have found that more than 50% of sudden cardiac deaths at altitude occur on the first day of exposure, and, importantly, the risk of [sudden cardiac death](#) may be reduced simply by one night of sleeping above 3,381 feet, which gives the body additional time to gradually acclimate to higher altitudes before engaging in physical activity.

For people with [coronary artery disease](#)—narrowed arteries leading to the heart—higher altitudes may cause coronary arteries to constrict, further limiting blood flow to the heart. This can lead to shortness of

breath, chest pain, dizziness and other symptoms, especially if these symptoms have been experienced at sea level. Coronary artery disease also raises the risk for acute coronary syndrome, which includes heart attacks and unstable angina or severe chest pain when at rest.

"The evidence indicates a trip to an area of higher altitude may need to be delayed for people who recently suffered a heart attack. For these individuals, it is important to see a doctor before traveling to the mountains," Cornwell said.

There are also special considerations at higher altitudes for people with [heart failure](#), specifically a condition called heart failure with reduced ejection fraction. Ejection fraction is the measure of how much blood the left ventricle of the heart is able to pump out with each contraction. For people with heart failure with reduced ejection fraction, altitude can cause elevated systemic blood pressure and elevated blood pressure in the arteries that lead to the lungs (also known as pulmonary hypertension), both of which could increase the workload on an already weakened heart. A rapid heart rate and a build-up of fluid in the lungs may also occur. The statement notes that heart failure medications, which decrease the heart's workload, may need to be adjusted so that these individuals can be physically active at higher altitudes.

Blood pressure is also influenced by altitude—at first, blood pressure may decline, but quickly increases in proportion to the altitude achieved. For people with difficult-to-control blood pressure and/or individuals who will be at [altitude](#) for prolonged periods, regular blood pressure monitoring may be required, according to the statement.

For adults who have had a heart attack, heart failure, angioplasty or heart surgery, the American Heart Association suggests considering a cardiac rehabilitation program independent of any plans to travel to the mountains. These programs can assist people with cardiovascular disease

in increasing their physical activity in a medically supervised environment. In general, the Association recommends adults get at least 150 minutes (2.5 hours) of moderate-intensity exercise per week, or 75 minutes of vigorous exercise per week.

Provided by American Heart Association

Citation: Advance planning can lower risks of high-altitude activities for people with heart disease (2021, September 9) retrieved 3 May 2024 from <https://medicalxpress.com/news/2021-09-advance-high-altitude-people-heart-disease.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.