

A trip to the mountains despite a heart condition?

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A team of experts, led by Gianfranco Parati, cardiologist of the

University of Milano-Bicocca and Head of the Department of Cardiology of the Istituto Auxologico in Milan, has sought to provide answers and recommendations for those potentially at risk. Gianfranco and esteemed colleagues have evaluated numerous studies related to the expected effects of high altitude exposure (exceeding 2,500 m above sea-level) on those individuals suffering from prevalent cardiovascular diseases. As a result of this detailed research, clinical recommendations for high altitude exposure in individuals with pre-existing cardiovascular conditions have been recently published in the renowned *European Heart Journal*. Also contributing to this study was Hermann Brugger, Head of the Eurac Research Institute of Mountain Emergency Medicine, who welcomes this rigorous scientific approach to informing clinical recommendations for the mountain environment.

Physical demands on the human body increase from altitudes of around 2,500 m onwards. The higher we ascend in the mountains, the lower the partial pressure of oxygen at a given altitude. This decrease in available oxygen stimulates a higher respiratory rate, increased cardiac output and after a few hours increased [blood pressure](#), placing greater stress on the cardiovascular system. It is especially important that people who suffer from particular cardiovascular diseases, such as high [blood](#) pressure or [coronary heart disease](#), or who have recently suffered a heart attack, should take great care when high up in the mountains.

"But these patients don't have to rule out a hike in the mountains completely, except in the case of very serious heart diseases," explains Hermann Brugger, emergency physician at the Eurac Research Institute of Mountain Emergency Medicine and President of the International Society for Mountain Medicine. "There are still lots of activities they can do, provided they follow the relevant guidelines, and in the best case scenario this activity could even lead to a general improvement in their health."

"A consultation with the doctor who is treating the patient is essential before they expose themselves to high altitudes. The doctor will assess the [cardiovascular risk factors](#) and tailor these new recommendations to the patient's overall health status. Of course, some difficulties may only manifest themselves when actually in the mountains," says Gianfranco Parati, who led the analysis.

For example, for patients with coronary heart [disease](#) where the [coronary blood vessels](#) have narrowed and the heart muscle is being supplied with less oxygen, the experts recommend that they should not exceed certain specific maximum altitudes. These are an altitude of 4,200 m for patients with mild coronary heart disease, and up to 2,500 m for those with moderate levels of the disease. For patients with a high level of coronary heart disease, the experts recommend that they should forego [mountain](#) hikes completely.

Continuing to take the correct medication is also of fundamental importance, say Parati and Brugger. "Medications which lower blood pressure, frequently also have a diuretic effect, eliminating excess salt and water in the blood, which in turn reduces blood volume and thereby lowers blood pressure. However, caution is advisable with taking such medications while in the mountains: with increased exertion and higher rates of transpiration the body loses more fluid, and the danger of dehydration is ever present."

Patients suffering from moderate to severe elevations in blood pressure are furthermore recommended to check their blood [pressure](#) regularly before and during their sojourn in the mountains.

For patients who follow all the recommendations, a mountain hike can have a positive effect on the progress of their disease, slowing it down and in many cases halting it altogether. "A mountain hike also has a positive effect on the psychological well-being of cardiovascular

patients. The knowledge that despite cardiovascular disease they have retained a degree of freedom and independence increases the patients' self-confidence and well-being," explains Brugger.

These recommendations have been drawn from a systematic analysis of all relevant studies into cardiovascular disease and exposure to high altitudes. Experts from the leading European and Italian societies for cardiology and hypertension ([high blood pressure](#)), as well as the International and Italian Societies of Mountain Medicine evaluated the research findings and drew up the recommendations.

More information: Gianfranco Parati et al, Clinical recommendations for high altitude exposure of individuals with pre-existing cardiovascular conditions, *European Heart Journal* (2017). [DOI: 10.1093/eurheartj/ehx720](#)

Provided by Eurac Research

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