key points

SELECTED BY
Dr Peter Saul
GP, Wrexham and Associate GP Dean for North Wales

Patients with borderline health should consult a physican before travelling to altitude. The physician will need to know the duration of the trip, ascent profile and how much exercise the patient plans to undertake. The presence of comorbid diseases which reduce oxygenation and ventilation should also be taken into account since these may interact with cardiovascular disease. Every patient must be assessed on an individual basis, there are no clinical investigations which reliably predict outcome at altitude. Complex cases may require advice from the patient's cardiologist.

Travelling from sea level to an altitude of 2,500 m causes a 20% reduction in the partial pressure of inspired oxygen. There is an initial net increase in myocardial oxygen consumption during the first 3–5 days, this then falls as cardiac output on exercise is reduced. During this time patients with angina pectoris may become symptomatic at a lower level of exercise than at sea level and should be advised to reduce their activity. After five days at 2,500 m, the exertion threshold returns to sea level values. Patients should not travel to high altitude immediately after an acute coronary syndrome. Most patients with stable coronary artery disease with a sufficiently high exercise capacity at sea level can go as high as 3,000–3,500 m with only a minimally increased risk.

Patients with heart failure experience a greater reduction in exercise performance than healthy people at high altitude. Patients with mild to moderately impaired systolic left ventricular function and mild symptoms may travel up to 3,000–3,500 m for a day trip. Those with severely impaired systolic left ventricular function and symptoms on moderate exercise at sea level should not travel to high altitude. While on acute exposure to altitude blood pressure falls, it starts to rise again within a few hours and this may continue over several weeks. Patients with poorly controlled hypertension at sea level should not travel to high altitude and those with controlled hypertension should be advised to consider taking their own blood pressure during a stay at altitude.

Patients with pulmonary hypertension diagnosed at cardiac catheterisation should not ascend to an altitude beyond 1,500–2,000 m. Those with a previous pulmonary embolism, and occlusion of a pulmonary artery or congenital absence of a pulmonary artery, even in the absence of pulmonary hypertension, are at high risk of developing high altitude pulmonary oedema.

Advice should be sought from a specialist about the safety of travel for patients with congenital heart disease. Care should be taken advising any patient with cyanotic congenital heart disease, atrial or ventricular septal defects, patent ductus arteriosus, or pulmonary atresia because of the risk of pulmonary hypertension, and coarctation of the aorta because of systemic hypertension.