

MAUNA KEA HAZARDS

EXPOSURE TO ALTITUDE

The summit elevation is 13,796 feet (4,205 m). The oxygen level is greatly reduced and a person can experience shortness of breath and/or impaired judgement. Reduced atmospheric pressure at high altitudes may cause **altitude sickness** or result in the development of other life threatening conditions such as **pulmonary edema** (fluid in the lungs) and **cerebral edema** (fluid on the brain). Also because the summit is above much of the atmosphere that blocks the sun's damaging ultraviolet rays, individuals risk exposure to serious sunburn and eye damage, especially if there is snow on the ground.

Precautions Before Ascending the Summit

- Prior to ascending the summit, acclimatize by spending at least 1/2 hour at the Visitor Information Station located at the 9,200 feet (2,804 m) elevation. This may lessen the intensity or onset of altitude sickness. If symptoms occur at this elevation, **do not** travel beyond the Visitor Information Station.
- Apply sunscreen and wear sunglasses and protective clothing.
- Hikers should register at the Visitor Information Station and use the buddy system.
- **DO NOT DRINK ALCOHOLIC BEVERAGES BEFORE OR DURING YOUR VISIT.**

Persons at Risk

It is strongly advised the following individuals not travel above the Visitor Information Station:

- Pregnant women
 - Individuals in poor physical condition
 - Individuals with heart or respiratory problems
 - Children under the age of 16*
- * Extended exposure to high altitudes could cause permanent damage to children whose bodies are still developing.

Symptoms of ALTITUDE SICKNESS include:

- Headaches
- Drowsiness
- Nausea
- Altered mental state
- Loss of balance
- Impaired reason

Symptoms of PULMONARY EDEMA and CEREBRAL EDEMA include:

- Severe headaches
- Vomiting
- Breathing difficulties
- Coughing
- Blue lips or fingernails
- Disorientation
- Extreme drowsiness (could result in a coma)

**IF SYMPTOMS PERSIST OR BECOME SEVERE,
IMMEDIATELY DESCEND TO A LOWER ELEVATION
IT COULD MEAN A MATTER OF LIFE OR DEATH!**

SNOW RECREATION

Because some of the slopes are very steep with rock outcroppings at the bottom, you are strongly advised NOT TO USE the following: **inner tubes, boogie boards, or other devices that are NOT equipped with braking mechanisms or which do NOT provide directional control on snow or ice.**

Due to the fragile environment and cultural significance of Mauna Kea AND safety to you and others using the mountain, **SNOW MOBILES OR ANY TYPE OF OFF-ROAD VEHICLES ARE PROHIBITED.**

- **THERE IS NO EQUIPMENT OR INFRASTRUCTURE AVAILABLE FOR ORGANIZED SNOW PLAY ON MAUNA KEA**
- **ALL SNOW RECREATION IS AT THE RISK OF THE INDIVIDUAL.**

High-Altitude Illness: How to Avoid It and How to Treat It

Every year millions of people go to the mountains for backpacking, skiing, mountain climbing and other activities. If you're planning a trip to altitudes over 8,000 feet, talk with your doctor about high-altitude illness (also called mountain sickness or altitude sickness).

What causes high-altitude illness?

The higher you climb above sea level, the less oxygen there is in the air. The oxygen level becomes very low at altitudes above 8,000 feet. This causes problems for people who normally live at lower altitudes because their bodies aren't used to working on so little oxygen. If you stay at a high altitude for a long time, your body gets used to the low oxygen level, and you don't get sick from it.

The following are the 3 main types of high-altitude illness:

- Acute mountain sickness
- High-altitude pulmonary edema (also called HAPE), which affects the lungs
- High-altitude cerebral edema (also called HACE), which affects the brain

These illnesses can be serious, but they can also be prevented.

How can I prevent high-altitude illness?

You can do 2 important things to prevent high-altitude illness:

1. **Take your time traveling to higher altitudes.** When you travel to a high altitude, your body will begin adjusting right away to the lower amount of oxygen in the air, but it takes several days for your body to adjust completely. If you're healthy, you can probably safely go from sea level to an altitude of 8,000 feet in a few days. But when you reach an altitude above 8,000 feet, don't go up faster than 1,000 feet per day. The closer you live to sea level, the more time your body will need to get used to a high altitude. Plan your trip so your body has time to get used to the high altitude before you start your physical activity.
2. **Sleep at an altitude that is lower than the altitude you are at during the day.** For example, if you ski at an elevation of 10,000 feet during the day, sleep the night before and the night after at an elevation of 8,500 feet.

How do I know if I'm getting high-altitude illness?

Some of the first signs of high-altitude illness are headache, lightheadedness, weakness, trouble sleeping and an upset stomach. If you have these symptoms, stop going up or go back down to a lower altitude until your symptoms go away. More severe symptoms include difficulty breathing even while you're resting, coughing, confusion and the inability to walk in a straight line. If you get these symptoms, go to a lower altitude right away and get help from a doctor.

What should I do if I get high-altitude illness?

The best treatment for any of the 3 high-altitude illnesses is to go down to a lower altitude right away. But if you only have mild symptoms, you may be able to stay at that altitude and let your body adjust. If you do this, don't exercise at all—just rest until you feel better.

If you have severe symptoms, go down 1,500 to 2,000 feet right away to see if your symptoms get better. Keep going down until your symptoms go away completely.

Medicines that may be used to prevent or treat the symptoms of severe high-altitude illness include acetazolamide (one brand name: Diamox) and nifedipine (one brand name: Procardia).

Don't ignore signs of high-altitude illness. People can die of this if they don't recognize the signs or if they don't believe their illness is caused by the high altitude. When you have signs of high-altitude illness, don't go higher until you feel better and your symptoms have gone away completely.

Is it safe to go to a high altitude if I have a chronic illness like heart disease or lung disease?

It depends on the type and severity of chronic illness you have. Most people who have a chronic illness, such as heart or lung disease, can safely spend time at a high altitude if their disease is under control. People who have coronary artery disease, mild emphysema or high blood pressure aren't at greater risk of high-altitude illness than people who don't have these diseases. They also don't risk making their disease worse by traveling to a high altitude. In addition, being overweight does not increase the risk of getting high-altitude illness.

Some diseases make going to a high altitude very dangerous. People who have sickle cell anemia shouldn't go to a high altitude. A high altitude is also dangerous for people who have severe lung disease, such as chronic obstructive pulmonary disease (COPD) or severe emphysema, and for people who have severe heart disease. If you have a chronic disease, ask your doctor if it's safe for you to travel to a high altitude.

Is going to a high altitude dangerous during pregnancy?

There isn't much information about the risk of high-altitude illness during pregnancy, so it's hard to say if going to a high altitude is safe for pregnant women. Some experts recommend that pregnant women not travel to an altitude above 8,000 feet. If you're pregnant, ask your doctor for advice before you travel to a high altitude.

What about children and high altitudes?

It's usually safe for children to go to high altitudes, but they're more likely to get high-altitude illness because their bodies have a hard time adjusting to the low oxygen level. A child may not be able to recognize the symptoms of high-altitude illness, so parents and other adults must carefully watch for any signs of high-altitude illness in children.