

ACCLIMATIZATION AND ALTITUDE SICKNESS

Trekkers whose body cannot adapt to the changes in altitude may face health hazards. Acute Mountain Sickness (AMS) is a frequent problem in the Himalayan region. It can affect a traveller in various ways that have little to do with age, sex or physical fitness. Acclimatization to altitude above 3000 m takes time to adjust. The body undergoes a number of physiological changes, some of which are increased pulse and respiratory rate. Others appear slowly over a period of weeks like the change in acid base balance and production of extra red blood cells. These changes and the effect of intense sunlight, strenuous walks and

dehydration may cause some mild or vague symptoms such as loss of appetite, fatigue, headache, nausea, dizziness, palpitations, sleeplessness, breathlessness.

The best treatment is prevention. Do not exert yourself or walk too fast. Drink plenty of liquid, eat well and watch for warning signs. Keep physical activity to the minimum. If you have a history of respiratory and heart problem please consult your doctor before embarking on any one of our trips.

As the body encounters high altitude, several physical changes start to occur:

- Hyperventilation (breathing faster, deeper, or both)
- Shortness of breath during exertion
- Changed breathing pattern at night
- Erratic sleeping habits
- Altitude diuresis i.e. as the kidneys excrete more fluid resulting in increased urination

Acute Mountain Sickness (AMS)

As one ascends in altitude, the body has to adapt to the decrease in oxygen that it is able to draw from breathing. Each person will respond to increasing altitude in different ways, and while some people may experience no symptoms of altitude sickness at an elevation of 5000, others may develop a range of symptoms as low as 3000m. Acute Mountain Sickness (AMS) is a combination of several factors that indicate that your body is not acclimating well to altitude. It is basically a situation where hypoxic stress occurs, i.e. when you ascend to an altitude where your body is unable to tolerate lower oxygen levels and as such, cannot function properly.

AMS is likely when one develops a headache, combined with the following factors, generally after ascent above 3000m:-

- Loss of appetite, nausea and/or vomiting
- Fatigue or weakness
- Dizziness, light-headedness or blurring vision
- Difficulty in sleeping
- Development of a wet, raspy cough

All of these symptoms may vary from mild to severe and the more severe the symptoms, the worse the AMS e.g. a person who is unable to sleep, is incapacitated with light headedness and is vomiting consistently, has severe AMS. Extreme cases of AMS can result in -

1) High Altitude Cerebral Edema.

This occurs when the brain swells and ceases to function properly. It is important to recognise that it can develop very quickly and can prove fatal in a matter of a few hours to one or two days. The key indicator of the start of HACE is when the person is unable to think clearly and as such, may not be aware that they are ill. They will also develop ataxia, or a loss of coordination, where they are unable to walk in a straight line, similar to that of drunken behaviour.

2) High Altitude Pulmonary Edema.

This occurs when fluid starts to build up in the lungs. Symptoms here include:-

- Extreme fatigue and drowsiness
- Breathlessness when at rest
- Fast, shallow breathing
- Wet cough
- Gurgling or rattling breaths
- Chest tightness, fullness, or congestion
- Blue or gray lips or fingernails

Interestingly, this is more common frequent in young, fit climbers or trekkers and frequently occurs at night.

In both of the above cases, immediate descent is imperative, to at least an altitude where the person previously felt well upon waking, but preferably lower. Both conditions resolve themselves relatively well at lower altitudes.

It is thus essential when climbing, that you and your fellow climbers monitor your bodies. Each person knows their body better than anyone else and so should be alerted to an increase in the above symptoms. Some people can develop nausea and a headache, and find that it disappears after a while and they are able to continue climbing, others cannot.

Preventative Prescription Medications (Guideline)

- **Diamox (Acetazolamide)**

allows you to breathe faster so that you metabolise more oxygen, thereby minimizing the symptoms caused by poor oxygenation. Possible side effects include tingling of the lips and finger tips, blurring of vision, and alteration of taste. Since Diamox is a sulfonamide drug, people who are allergic to sulphur should not take Diamox. It is important that people take a tablet to "try" in case of adverse reactions. Normally, dose is 125mg twice daily or 250mg once per day.

- **Dexamethasone (a steroid)**

is a prescription drug that decreases brain and other swelling reversing the effects of AMS. Dosage is typically 4 mg twice a day for a few days starting with the ascent. It should be used with caution and only on the advice of a physician because of possible serious side effects. It may be combined with Diamox.

WHAT YOU CAN DO TO PREVENT ILLNESS AT HIGH ALTITUDE?

Begin your trip in good health and excellent physical condition, obtain all the recommended immunizations for your trip, and follow food and water precautions on the way so that preventable illnesses do not ruin your trip. It is important to understand the concept of altitude acclimatization and to recognize the symptoms of altitude illness. The discussion of altitude illness in your health information supplements this material and provides more details on acclimatization and symptoms of altitude illness.

Our treks are designed to allow time for acclimatization while trying to follow a schedule that accommodates peoples' time constraints. Certain aspects of the trek organization and schedule that may seem illogical are designed to maximize acclimatization. For instance, once at altitude, elevation gains between camps are limited: you may climb higher during the day but descend to sleep (climb high, sleep low). Extra nights are spent at the same elevation after each 2,000-3,000-foot gain over 12,000 feet. Drink a lot of water. Although *Pulmonary Edema* and *Cerebral Edema* are problems of fluid retention, increased water intake facilitates adaptation to altitude. Increased fluids help the kidney to excrete excess salts that bind extra water in tissues. Drink more than you feel you need. Water losses at altitude are very large and dehydration is commonplace. Most of this water is lost as vapour due to increased respiration in a cold, dry atmosphere with very low vapor pressure. Eating is also important. Diet should be high in carbohydrates, with adequate amounts of protein to rebuild muscle that is being broken down by strenuous exercise.

HOW DO WE PREPARE?

Per chance anyone has a real problem with altitude we have some medicines in our first-aid kit and a Portable Altitude Chamber (PAC) on our trips.

The PAC is an effective, simple, durable, lightweight and affordable hyperbaric chamber for use at high altitude. Our staff knows how to deal with altitude illness in any situation, in any weather, and at any time. The treatment of severe altitude illness (HACE and HACE) is to descent. But if conditions do not allow for an immediate and effective descent, the use of PAC technology is life saving.

The hyperbaric chamber concept for treating altitude illness has been around for more than 20 years. The PAC works by increasing the pressure inside the chamber, using a foot pump. At high altitude, this increased pressure delivers a therapeutically significant amount of extra oxygen to the victim, which simulates a descent.

Warning!

Makalu Adventure provides this information as a guide only and cannot be held responsible for any adverse reactions to altitude in any way whatsoever or any advice on medications. It is the responsibility of the participants to familiarize themselves with the effects of altitude before embarking on any climbs to altitude, and that they consult their medical practitioner on the use of any medications.