

# TENT & TRAILS

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## AMS - Acute Mountain Sickness

Acute Mountain Sickness (AMS) is a constellation of symptoms that represents your body not being acclimatized to its current altitude. As you ascend, your body acclimatizes to the decreasing oxygen (hypoxia). At any moment, there is an "ideal" altitude where your body is in balance; most likely this is the last elevation at which you slept. Extending above this is an indefinite gray zone where your body can tolerate the lower oxygen levels, but to which you are not quite acclimatized. If you get above the upper limit of this zone, there is not enough oxygen for your body to function properly, and symptoms of hypoxic distress occur - this is AMS.

### Zone of Tolerance

Go too high above what you are prepared for, and you get sick.

This "zone of tolerance" moves up with you as you acclimatize. Each day, as you ascend, you are acclimatizing to a higher elevation, and thus your zone of tolerance extends that much higher up the mountain. The trick is to limit your daily upward travel to stay within that tolerance zone.

The exact mechanisms of AMS are not completely understood, but the symptoms are thought to be due to mild swelling of brain tissue in response to the hypoxic stress. If this swelling progresses far enough, significant brain dysfunction occurs. This brain tissue distress causes a number of symptoms; universally present is a headache, along with a variety of other symptoms.

### Signs

The diagnosis of AMS is made when a headache, with any one or more of the following symptoms is present after a recent ascent above 2500 meters (8000 feet)

- Loss of appetite, nausea, or vomiting
- Fatigue or weakness
- Dizziness or light-headedness
- Difficulty sleeping

All of these symptoms may vary from mild to severe. A scoring system has been developed based on the Lake Louise criteria; look at the AMS questionnaire for a simple method to evaluate an individual's AMS severity.

AMS has been likened to a bad hangover, or worse. However, because the symptoms of mild AMS can be somewhat vague, a useful rule-of-thumb is: if you feel unwell at altitude, it is altitude sickness unless there is another obvious explanation (such as diarrhea).

Anyone who goes to altitude can get AMS. It is primarily related to individual physiology (genetics) and the rate of ascent; there is no significant effect of age, gender, physical fitness, or previous altitude experience. Some people acclimatize quickly, and can ascend rapidly; others acclimatize slowly and have trouble staying well even on a slow ascent. There are factors that we don't understand; the same person may get AMS on one trip and not another despite an identical





ascent itinerary. Unfortunately, no way has been found to predict who is likely to get sick at altitude.

It is remarkable how many people mistakenly believe that a headache at altitude is "normal"; it is not. Denial is also common - be willing to admit that you have altitude illness, that's the first step to staying out of trouble.

It is OK to get altitude illness, it can happen to anyone. It is not OK to die from it. With the information in this tutorial, you should be able to avoid the severe, life-threatening forms of altitude illness.

### The Golden Rules

#### GOLDEN RULE I:

If you feel unwell at altitude it is altitude illness until proven otherwise.

#### GOLDEN RULE II:

Never ascend with symptoms of AMS.

#### GOLDEN RULE III:

If you are getting worse, go down at once.

### Prevention

#### Things to Avoid

Respiratory depression (the slowing down of breathing) can be caused by various medications, and may be a problem at altitude. The following medications can do this, and should never be used by someone who has symptoms of altitude illness (these may be safe in persons who are not ill, although this remains controversial)

- Alcohol
- Sleeping pills (acetazolamide is the sleeping tablet of choice at altitude)
- Narcotic pain medications in more than modest doses

#### Preventing AMS

The key to avoiding AMS is a gradual ascent that gives your body time to acclimatize. People acclimatize at different rates, so no absolute statements are possible, but in general, the following recommendations will keep most people from getting AMS

- If possible, you should spend at least one night at an intermediate elevation below 3000 meters.
- At altitudes above 3000 meters (10,000 feet), your sleeping elevation should not increase more than 300-500 meters (1000-1500 feet) per night.
- Every 1000 meters (3000 feet) you should spend a second night at the same elevation.

Remember, it's how high you sleep each night that really counts; climbers have understood this for years, and have a maxim "climb high, sleep low". The day hikes to higher elevations that you take on your "rest days" (when you spend a second night at the same altitude) help your acclimatization by exposing you to higher elevations, then you return to a lower (safer) elevation to sleep. This second night also ensures that you are fully acclimatized and ready for further ascent.

