

# North East Valley Division of General Practice, Victoria ([www.nevdgp.org.au](http://www.nevdgp.org.au))

## AMS (Acute Mountain Sickness) (Reviewed March 2010) – Online [www.cdc.gov/travel](http://www.cdc.gov/travel)

### WHAT IS IT?

Most people who ascend rapidly to heights above 2500 metres (8200 ft) have a period of unpleasant adjustment. During this time they may have a variety of symptoms, the most prominent of which are headache, lassitude, loss of appetite, insomnia, nausea & vomiting.

These symptoms are collectively referred to as acute mountain sickness (AMS). Acute mountain sickness is a preventable and potentially serious disease. Travellers to high altitude destinations should be aware of AMS.

### HOW AND WHEN DOES IT OCCUR?

Acute mountain sickness is infrequent below 2500 m. It occurs in travellers who rapidly ascend to altitudes of 2500 m or more; travellers who drive, ride or fly to high altitude sites in the Andes and the Himalayas are more at risk than those who walk in. The risk relates more to the speed of ascent than the altitude reached. The problem is caused by the reduction in atmospheric pressure with altitude. Less oxygen reaches the muscles and the brain, and the heart and lungs must work harder to compensate.

Youth and fitness do not prevent AMS.

**WHAT ARE THE SYMPTOMS?** AMS develops over a few hours to a few days usually during the first 1-2 days at high altitude. In rare cases AMS may be delayed by as long as 3 weeks.

**Mild form of AMS:** Symptoms include headache, dizziness, fatigue, loss of appetite, nausea, and a general feeling of being unwell that is often compared to having the flu or a hangover. The symptoms of mild AMS are an important warning and should not be ignored.

**Severe AMS:** It may develop from mild AMS or it may begin with little or no warning. There are 2 types of severe AMS-high altitude pulmonary oedema (fluid in the lungs) and high altitude cerebral oedema (swelling of the brain). They may occur independently, but usually both forms occur together.

The symptoms may include severe headache, vomiting, severe lassitude, drowsiness, giddiness, inability to sit upright, shortness of breath at rest, cyanosis (blue' nails and lips), cough and white or pink frothy sputum. It is important to remember that people with AMS are a risk to themselves as well as others, are more likely to fall or have other injuries and be belligerent, irrational and irresponsible. (Refusing to descend to a lower altitude).

**A simple daily test of a persons ability to walk a straight line will often detect early cases.**

### PREVENTING ACUTE MOUNTAIN SICKNESS

The most effective preventive measure to avoid AMS is gradual acclimatisation and slow ascent. The altitude at which the climber sleeps is the most important factor: climb high but sleep low. Once above 3000 m particular care should be taken not to increase the sleeping altitude by more than 300 metres per day, and to spend an extra day for each 1000 m gained. For trekking above 3500 m it is advisable that you travel with an experienced leader or guide.

Those who fly to high altitude must be prepared to spend time acclimatising on arrival. The body's water losses

increase during an active day in the dry cold air at high altitude. Therefore, fluid intake should be increased (you may need as much as 4-7 litres per day).

Insomnia should not be treated with sleeping pills, since they tend to aggravate a low oxygen level during sleep.

Drugs to prevent AMS often only hide the warning symptoms. In general it is much safer to rely on good planning and gradual ascent rather than medication. However drugs may be useful in selected individuals, such as those known to be at risk of AMS.

**Acetazolamide (Diamox)** Diamox 250 mg tablets(1/4 up to 1 tablet) given twice a day commencing one or 2 days before the ascent to altitude above 2500 m and continued for at least 5 days.

Side effects are common, but they are mild and usually well tolerated. They include paraesthesia (tingling sensation in fingers and toes), bowel disturbances, sleepiness and increased urine volume. Acetazolamide should not be taken by individuals who are allergic to sulpha drugs. Spironolactone (Aldactone) 25mg 4 times a day , can be used in those allergic to sulpha medication.

**Salmeterol inhaler:** (Serevent, Oxis) 125mg inhaled 12 hourly starting the day before ascent has recently been shown to be useful in preventing HAPE. It should be used in conjunction with Acetazolamide.

**Dexamethasone:** For most travelers, the best way to avoid altitude illness is by gradual ascent, with extra rest days at intermediate altitudes every 3,000 ft (900 m) or less. Dexamethasone and pulmonary artery pressure-lowering drugs, such as nifedipine or sildenafil, may be carried for emergencies.

### TREATMENT OF ACUTE MOUNTAIN SICKNESS?

#### Mild AMS

The rule is to remain at the same altitude until you have recovered. This often takes only 1 or 2 days. Most cases of mild AMS will improve with rest, aspirin or paracetamol in normal doses, and avoidance of alcohol. If necessary, descent of a few hundred metres is usually curative.

#### Severe AMS

The most effective and important immediate measure in those with severe AMS is descent or evacuation to a lower altitude. Frequently a descent of 500-1000 m is sufficient.

Additional measures include oxygen, dexamethasone (8 mg initially, then 4 mg every 6 hours for 1 to 3 days, then tapered over 5 days), nifedipine 10mg tds for high altitude pulmonary oedema and acetazolamide.

Drug treatment should never be used to avoid descent, or enable further ascent, by a person with AMS.

A portable hyperbaric chamber such as the Gamonbag (a large portable airtight bag with an air pump) may be very useful in diagnosing and treating AMS. Like medication, however, it is no substitute for evacuation of a victim.

**OTHER CONSIDERATIONS** Higher risk of UV sunlight injuries, hypothermia, thrombophlebitis (dangerous blood clots in leg veins) and retinopathy (eye damage) occur. Insurance to cover helicopter evacuation may save you a \$100,000 bill.