

Prevention of Altitude Sickness

Some tips for attendees at the 2015 AHG Symposium

by Paul Bergner

If you are coming to the 2015 AHG conference in Granby, the Snow Mountain ranch is at 8750 feet in elevation, and you should be prepared for the symptoms of altitude sickness. I lived in Boulder, CO for 17 years, at 5500 feet, and saw the effects of altitude on visitors and students traveling there throughout that time, many hundreds of closely observed cases. Nearly everyone coming to 5500 feet directly from sea level experienced some symptoms, such as headache, afternoon fatigue, and nighttime insomnia for the first few days after arrival. I also took many students from Boulder up to higher elevations for plant walks or camping, ranging from 7500 to 10500 feet, and even people adapted to 5500 feet will experience symptoms at those higher elevations, especially with an overnight stay. The most severe symptoms I've seen have occurred in those coming from sea level to more than 8000 feet. I attended and did medical care at several events where everyone had come from sea level to that altitude and 100% of them developed symptoms, some severe, and many could not sleep without herbs. One person going from sea level to only 7500 feet had severe symptoms and barfed all over my car. Most people coming to this conference at 8750 feet will experience some or all of the following, and those coming from lower elevations can expect significant discomfort. This article will tell you some ways to moderate those symptoms.

Symptoms of mild Acute Mountain Sickness (AMS)

- Headache (nearly universal)
- Appetite loss, nausea, vomiting if severe
- Overall fatigue, especially late afternoon, lowered endurance
- Shortness of breath on exertion
- Wooziness, light-headedness.
- Nighttime insomnia

Individuals who move to and remain at high altitude long enough to adapt will lose these symptoms after a few days to a week, depending on their level of exertion, diet, and other factors. If you are coming to this altitude for just a few days at the conference, do not expect to adapt. My experience is that for overnight stays, as opposed to day hikes, the symptoms get worse each night for 2-3 nights.

The Pathology

Two conditions at high altitude are responsible for the symptoms: a shortage of oxygen — at 8000 ft oxygen is reduced about 25% compared to sea level — and low atmospheric pressure. As the kidney detects lower oxygen in the blood, it dumps water in order to thicken the blood. The lower atmospheric pressure causes increased transpiration of water from the surface of the skin. Thus you urinate more water, but also lose it from your skin without sweating. So the primary pathology is dehydration. At the same time the kidney secretes a hormone to stimulate the bone marrow to produce more red blood cells. You have a relative Blood Deficiency, in Chinese terms. Red blood cell counts can increase 30% in 3 weeks or so. The body goes into metabolic overdrive 24 hours a day to produce red blood cells the minute you are at high altitude, and this is part of the cause of insomnia and fatigue. Your few days at the conference will not be sufficient for you to get any benefit of such blood building but you might consider a blood building strategy ahead of time if you have any of the classical symptoms of blood deficiency already.

In addition to the the milder Acute Mountain Sickness above, two life-threatening complications can occur. This is not to be alarmist, but so individuals can be aware for themselves and their neighbors. The lower atmospheric pressure can cause fluid to leak out of the cells, causing either pulmonary or cerebral edema. These are more common in mountain climbers ascending to very high altitudes, but they may begin as low as 7500 feet. I saw one case of probable cerebral edema in an individual who came from sea level and spent several nights at 8000 feet. The primary risk factors for these are 1) symptoms of AMS, especially more severe ones and 2) continued exertion despite symptoms. If you develop AMS, you are at risk for these other two conditions. If you have the AMS symptoms listed above, **Stop. Do not exercise. Rest. Relax.**

The red flag warning symptom of **High Altitude Pulmonary Edema** is breathlessness while resting. Mildly increased breathing and pulse is normal, but not breathlessness. As one mountain climber put it: "It is never normal to feel breathless when you are resting - even on the summit of Everest." Inability to catch the breath while sitting still at altitude is a 911 emergency symptom and the individual should be transported to a lower elevation immediately and get emergency medical care as soon as possible. Individuals may also have a fever or cough up of foamy spit.

High Altitude Cerebral Edema is fluid on the brain. It causes confusion, clumsiness, gait disturbance, and stumbling. Headache may or may not be severe. The first signs after the initial AMS symptoms may be changes in behavior, sudden emotional or violent outbursts. Drowsiness and loss of consciousness are grave symptoms. When I had just moved to Colorado, I saw a man who had the severe headache and violent behavioral changes at 8000 which went away on moving to a lower elevation. I did not recognize it at the time but I am sure he had the first symptoms of cerebral edema. These complications are not likely at this conference, but are possible, watch out for your self and for the people around you.

Prevention

Hydrate

Since you will be at altitude for only a few days, you won't adapt, your kidneys will continue to dump water, your skin will continue to shed water vapor, and your only recourse is to hydrate every hour you are awake. Hydrate at night if you wake up. If you just drink water, however, it will pass right through you. So consider:

- Electrolyte replacement drinks, powders, tablets, etc.
- Coconut water (may dilute in your drinking water)
- Demulcent herbs added to your drinking water. Here are a few of my favorites
 - A simple of *Althaea*. A cup of the tea in the bottom of your liter drinking bottle, fill with water, add flavoring to taste, lemon, a little rose elixir, or a handful of *Lycium* berries.
 - 3 parts *Althaea* and 1 part each of *Ulmus* and *Glycyrrhiza*. A cup of tea in your liter bottle of water.
 - Shatavari (*Asparagus*) and *Lycium* berry, a simple long infusion added to your water bottle. Or just put a tablespoon of each herb in you drinking water.

Alcohol

Alcohol contributes to dehydration, the chief pathological root of most of the symptoms of AMS. It also depresses respiration and reduces the absorption of oxygen. If you have symptoms of AMS, alcohol will make it worse, and drinking to intoxication will make it much worse. People can also develop major hangover from just a few drinks at altitude.

Cannabis

So Cannabis is legal in Colorado, and there are dispensaries down the road, and your temptation to party may be strong. But be careful. Cannabis is drying, and can aggravate the symptoms of AMS, especially in overdose. The dose you are used to may be too much in the conditions of high altitude and may aggravate AMS symptoms. Especially avoid overdose which is easy to achieve with forms such as the edibles that adorn the shelves of the Colorado dispensaries. Note that dosing listed on edibles labels has been repeatedly shown to be unreliable, and the actual dose in the product may be much larger or smaller than that listed. Keep to a minimal dose.

Exercise

For a short trip such as this *avoid exercise as much as possible*. Skip your regular workouts for the time you are at the conference. Walk in a way that conserves energy. This is especially important if you are developing any symptoms of altitude sickness. Any exercise will aggravate your symptoms. If you develop symptoms, slow down, stop, lie down, rest, and try some of the remedies below. Use them to support your rest, not to try to support exertion. Note that physical conditioning offers no protection whatsoever against AMS or its complications.

Herbal remedies

Ginkgo

The most reliable single remedy I have seen for AMS is Ginkgo *biloba* standardized extract capsules. I am not particularly enamored of this form of herb, but do not expect a tincture or some other kind of capsule to do the trick. I use the Ginkgold brand from Nature's Way because I know it is the authentic European Ginkgo product. A single 60 mg cap will typically cure an altitude headache with insomnia at bedtime in about 30 minutes. You could take one dose twice a day. Remember if you are on medication, Ginkgo does not mix well with blood thinners. Ginkgo increases peripheral and cerebral circulation and increases oxygenation of the brain. Some people recommend taking it in advance, I use it acutely only, a single dose increases capillary circulation within a very short time and there is no build-up of the herb necessary for this effect.

Chlorophyll

Next is a chlorophyll product from Herbs Etc in Santa Fe called *Chloroxygen*. You can get either a liquid form in a dropper bottle or capsule form, and they both work. I do not have a clue how chlorophyll can rapidly alter the symptoms of AMS, but I have seen it now in many dozens of cases of people at the limits of their tolerance of their altitude symptoms — they typically feel better within 30 minutes. This was widely used in my school in Boulder, and now at its successor school the Colorado School of Clinical Herbalism. It is very well known to some local companies in Boulder who bring people from lower altitudes for business meetings.

Adaptogens

When I lived in Boulder, I regularly used the Pine Mountain brand Cordyceps Tablets, with *Eleutherococcus*, *Schisandra*, and *Rhodiola* extracts for day trips to high altitude, and it is very effective for that. It is a knockoff of a popular European adaptogen formula. You can also use the individual herbs and mix them in tincture form or use them as simples.

Rhodiola may help with the energy crash of AMS, but it can aggravate the symptoms in other ways. It is very drying, for some people oppressively so, exactly the opposite of an effect you want at high altitude as your body is dumping and exuding water. It can also interfere with sleep if you take it too late in the day and can make altitude-induced insomnia worse.

If using *Eleutherococcus* as a simple, I recommend the HerbPharm brand tincture, simply because it is the only product I am aware of that makes an *Eleutherococcus* tincture based on the Russian Pharmacopoeia methods. A standardized product you are familiar with may also be effective. As with *Rhodiola*, do not use this later in the day or it can aggravate AMS insomnia, and sometimes severely.

In China, a classic tonic (adaptogen) formula is used for altitude sickness, it combines *Panax ginseng* (2 parts) with *Schisandra* (1 part) and adding the mild demulcent tonic Ophiopogon (2 parts) to correct the dryness of the *Schisandra* and to moisten the system. I adapt this strategy by substituting the more moistening *Panax quinquefolius* (2-3 parts) with *Schisandra* (1 part) as tinctures, and making sure the individual is obtaining demulcents in other forms.

While living in Boulder I heard many times that *Ligusticum porteri* (Osha) helps with altitude sickness, and I suspect this is true for mild symptoms on day hikes or short trips. I've not seen it to be helpful for anything other than very mild AMS symptoms, and seen it fail to have a significant effect many times.

Susceptibility

Some individuals experience much worse symptoms than others, and the reason for this is not always clear. Coming from lower altitude, engaging in physical exertion, consuming alcohol, taking prescription drugs which might promote dehydration, are all factors. Constitutionally, individuals with Blood Deficiency and Yin Deficiency are the most prone to strong symptoms. Chronic symptoms such as weak thready pulse, pale skin, lips, conjunctiva, light headedness, scanty menses, etc. or dryness and thirst with night sweats predispose to worse symptoms of AMS. Individuals with those symptoms might consider a course of constitutional medicine incorporating diet (red meat) and herbs (Blood and Yin Tonics) to build the blood before traveling.

See a full description of altitude sickness and the drugs used to treat it, written by Mary Barnes (AHG, NAIMH) the current clinic director at the Colorado School of Clinical Herbalism, my former school in Boulder. Mary grew up at 12000 ft and lives at 10,000 now. See: [http://naimh.com/Altitude Sickness Barnes.pdf](http://naimh.com/Altitude%20Sickness%20Barnes.pdf)

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