Altitude Illnesses
Altitude illnesses are the result of insufficient oxygen in the blood (hypoxia) due to decreasing barometric pressure as elevation is gained. As altitude is gained, air grows “thinner” and less oxygen is inhaled with each breath. Problems range from discomfort to life-threatening.

Acute Mountain Sickness (AMS) occurs in someone who has recently arrived at an altitude of around 6,500-8,000 feet or higher. There are no characteristic physical findings, and the syndrome resembles an alcohol hangover. Signs & symptoms may appear below high altitude, but are then more often the result of a problem other than AMS such as dehydration or heat illness.

**Signs & symptoms** include:
- Person has recently arrived at high altitude
- Headache
- Loss of normal appetite
- Nausea (with or without vomiting)
- Insomnia
- Unusual weariness or exhaustion (lassitude)

**Treatment:**
- Descend or stop ascent, and wait for improvement before going higher.
- Administer oxygen if available & you are trained to do so.
- Aspirin or acetaminophen is useful for headaches (administer only with prior parental or physician consent)

High Altitude Cerebral Edema (HACE) is caused by fluid collecting within the brain, increasing pressure on the brain until it fails to function properly, and eventually fails to function, resulting in death.

**Signs & symptoms** include:
- Loss of coordination (inability to walk a straight line or stand straight with feet together & eyes closed)
- Severe headache unrelieved by rest & medication
- Bizarre changes in personality
- Possible seizures, and/or coma

**Treatment:**
- Descend to a lower altitude as soon as possible.
- Administer oxygen if available & you are trained to do so.

High Altitude Pulmonary Edema (HAPE) is caused by fluid collecting in the air spaces of the lungs. If enough fluid collects, the patient cannot breathe adequately, and death may result.

**Signs & symptoms** include:
- Dry cough, soon followed by complaints of shortness of breath, even at rest.
- Shortness of breath becomes more pronounced, with perhaps complaints of chest pains
- Cough that becomes more productive, producing frothy mucus early, and reddish mucus later

**Treatment:**
- Descend to a lower altitude as soon as possible. A descent of 1,000-1,500 feet may produce remarkable results.
- Administer oxygen if available & you are trained to do so.

Evacuation Guidelines
Patients with AMS should not continue to ascend until the symptoms resolve, but they do not require evacuation unless the symptoms do not resolve. Evacuation requires a loss of altitude. Patients with HACE or HAPE require a rapid evacuation to a lower altitude (at least 1,000-1,500 feet) and evaluation as soon as possible by a physician.

Guidelines for Prevention of Altitude Illnesses
Most altitude illnesses are preventable. The following guidelines reduce the incidence & severity of illness. Although these measures do not guarantee anyone freedom from illness, they are highly recommended, especially for those without altitude experience.

- **Staged ascent:** The most critical factor in preventing illness is to gain altitude no faster than your body can acclimate (physically adjust) to the decrease in barometric pressure. Acclimatize by gradually increasing the altitude of overnight camps. If possible, the first camp should be no higher than 8,000 feet, with an increase of no more than 1,000-1,500 feet per night. If a trip is started at higher than 9,000 feet, two nights should be spent acclimatizing at that altitude before proceeding higher. Proceed higher during the day, if you wish, but return to a lower elevation to sleep (climb high, sleep low).

- **High-carbohydrate diet:** A diet of at least 70% carbohydrates can reduce symptoms of AMS by about 30% at higher altitudes, and can be started 1-2 days prior to reaching higher altitudes.

- **Appropriate exercise level:** Until acclimatized, exercise moderately, avoiding excessive shortness of breath and fatigue.

- **Hydration:** To offset increased fluid losses at high altitudes, stay well hydrated.

- **Medication to prevent illness:** Several drugs can lessen the symptoms of illness; however, their use is not recommended as a routine measure. Persons going to altitudes greater than 8,000 feet should discuss the use of medications to prevent altitude illness with their physician. No drug should be taken, even if available, without direction from a physician.

-Adapted from the Wilderness First Aid Curriculum and Doctrine Guidelines, Boy Scouts of America, pg 34-35, March 2010