

## Will You be Visiting South Pole Station?

In the upcoming season, you will be traveling to not only one of the coldest climates on earth, but also to a high altitude environment. When traveling to Antarctica, we prepare physically and mentally for the physical impacts of extreme cold. Below, we hope to stress the equal importance of preparing for the effects of high altitude on your body, and the efforts you can make in your first week at altitude to prevent altitude related illnesses.

**What is considered “high altitude”?** “High altitude” is defined as altitudes exceeding 6,000 to 8,000 feet. Above these levels, changes in the pressures of gases we breathe, and of oxygen in particular, result in a number of chemical changes in our bodies – some of which can be unpleasant.

**How do we adapt to high altitude?** We begin to adapt to these changes, or acclimatize, within hours of our exposure to altitude. Significant adaptations occur within the first four days at altitude. It may take a month or more to completely adapt. Individuals with certain medical conditions – most of which we screen for in your PQ process – may never properly adapt to high altitude environments, and therefore may not qualify for South Pole employment. South Pole residents are challenged in their acclimatization because they are not able to gradually ascend to altitude, as one might on a gradual climb to a mountain peak; instead, residents are flown directly from sea level to approximately 11,000 feet of altitude. This requires vigilance to prevent overexertion in the first days at altitude, as overexertion can significantly increase the risk of developing an altitude-related illness.

**What are the physical problems (Altitude Related Illnesses) I might experience with my initial arrival at altitude?**

- **Periodic Breathing of Altitude:** This irregular breathing pattern, part of normal acclimatization, presents as multiple breaths followed by pauses in breathing. Most evident at night, this breathing pattern can cause repeated awakenings, leading to poor or disrupted sleep and subsequent daytime fatigue. In some individuals, blood oxygen levels will drop significantly with breathing pauses, putting them at risk for further altitude related illnesses. Chemicals which suppress the drive to breathe – such as alcohol and sleeping medications – can worsen the effects of periodic breathing, and are therefore not recommended while acclimatizing. **Treatment:** Periodic breathing can be reduced through the use of acetazolamide (Diamox) 125mg at bedtime in the first three to four days at altitude.
- **Acute Mountain Sickness (AMS):** AMS, a syndrome of headache, nausea, loss of appetite, dizziness, and worsened periodic breathing, impacts approximately 30% of people traveling to high altitude. It normally presents in day one to three at altitude. **Anyone can get AMS – even people who have lived and worked at high altitude in the past without any problem.** Excessive exertion and dehydration in one’s first days at altitude, and possibly a high salt diet, increase the risk for getting AMS. Remaining well hydrated – at least four liters of water per day, practicing a low salt diet, and doing no heavy physical exertion for the first two to four days at altitude will reduce one’s risk of getting AMS. **Treatment:** Diamox (250mg) twice a day, started the day before ascent, and continued for the first three to four days at altitude, will reduce the risk of getting AMS. (This dosing will also treat Periodic Breathing, mentioned above.) Ginkgo, previously thought to be of benefit at altitude, has recently been found to be ineffective at preventing AMS. Using supplemental oxygen, especially at night, can also help reduce symptoms.

- **High Altitude Pulmonary Edema (HAPE):** HAPE occurs when leaky tissues and blood vessel spasms in the lung cause the lungs to backflow with fluid, including blood. Three percent of people going to altitude are expected to develop HAPE, which normally presents on day two to three at altitude. Symptoms initially include shortness of breath at rest and with lying flat; they can progress to dry, wet, pink-frothy or bloody cough, associated with an inability to catch one's breath. This is a serious and progressive condition, which if untreated can lead to death. Risk for HAPE can be reduced by avoiding heavy exertion in one's first three to four days at altitude, taking Diamox to reduce periodic breathing and pauses, and keeping warm – to include breathing through a neck gaiter outside to prevent cold-induced spasm of blood vessels of the lungs. **Treatment:** Diamox (250mg) twice a day, possible blood vessel dilators like nifedepine or Viagra, inhalers such as albuterol, dexamethasone, oxygen and possible descent from altitude. The medical providers at McMurdo and Pole Stations can best assist you on the advisability of any of the other medications beside or in addition to Diamox.
- **High Altitude Cerebral Edema (HACE):** HACE is brain swelling, resulting from the low oxygen environment, and the body's chemical reactions thereunto. HACE is rare at South Pole's altitude, but can be seen when oxygenation is worsened by the presence of HAPE. Therefore, HACE and HAPE are commonly seen together. HACE presents with severe headache, dizziness and ataxia (falling over due to lack of balance), extreme nausea/vomiting, altered levels of consciousness including unconsciousness, and seizures. Without treatment, HACE can be fatal. **Treatment:** Diamox (250mg) twice a day, dexamethasone to reduce brain swelling, oxygen and descent from altitude.

**What if I've never had an altitude related illness before, and I've been to altitude many times?** You are still at risk for getting altitude illness. If you've gone to altitude 99 times, you may get altitude illness on your hundredth ascent. If you live at altitude, your time in New Zealand and McMurdo is sufficient to allow you to lose your previous altitude acclimatization. The only predictor that you will get sick is that you've been sick before. Therefore, **everyone** must take seriously the above precautions and strongly consider taking medicine to prevent altitude illness.

**Where do I get Acetazolamide (Diamox)?** You can get Diamox at McMurdo Medical before you go to Pole at any time during the season. If you are going to Pole directly, you will be met by a member of the McMurdo medical team upon your arrival to Antarctica, given a briefing about altitude illness, and offered Diamox before your Pole flight. If you forget to get your Diamox in McMurdo, it is also available from the South Pole Clinic.

**What if I have other questions about Altitude Related Illnesses?** Feel free to stop by in the medical clinics at McMurdo or South Pole, or speak to your regular doctor before you deploy. A good website to read more about altitude illnesses is: [www.basecampmd.com](http://www.basecampmd.com).



Technical Services Company LLC  
Polar Services

7400 S Tucson Way  
Centennial, Colorado  
80112-3938 USA  
303.790.8606

To USAP Participants: **(Personal Prescription Medications)**

It is the responsibility of all participants to obtain a supply of their regular prescription medications to cover the time that they will be deployed. **The Stations do not have prescriptions available to support maintenance medications – our medication stock is limited to support emergent requirements, in accordance with NSF requirements.** Additionally, **if any changes to your medical well-being occurs after PQ, you are required to let us know so we can ensure your continued good health while deployed.** Participants will not be allowed to winter-over unless they have enough of their regular medications to last through the winter season. The New Zealand custom laws, however, only allow for three months of prescription medications and one month of controlled prescription medications to be hand carried through New Zealand. Therefore, if you will be deployed for a longer period of time, you must make arrangements for additional medication to be mailed to the Station Medical Clinic through the APO mail system. The medications will need to be in properly labeled pharmacy containers to be passed through the APO system. It is important that you hand carry the initial three months of medication (one month for controlled medications) in order to provide enough time for the mail to reach you in Antarctica. When you get your prescription medications filled, ask the pharmacist to put three months of medication (or one month of controlled medications) in one labeled container and the remainder in a separately labeled container. If you are not sure if your medication is controlled (Class II or III), ask the pharmacist when you get the prescription filled. Mail the containers with the remainder of the medication to the Medical Clinic at the Station where you will be deployed.

Mail the medication to the APO address listed below. Packages destined for summer participants should be mailed after Labor Day or they will be returned. The addresses for the Medical Clinics are:

**McMurdo Station – RPSC**

Medical Clinic, RPSC  
McMurdo Station  
PSC 469 Box 700  
APO AP 96599-1035

**South Pole Station -- RPSC**

Medical Clinic  
South Pole Station  
PSC 468 Box 400  
APO AP 96598

The Medical Clinic will open the packages upon receipt at the Station and maintain an Excel spreadsheet listing the name of the participant, the name and amount of the medication, date received, the date that the medication was dispensed to the participant and the signature of the person dispensing the medication. The Medical Clinic will notify the participant when the medication is received. The participant will go to the Clinic to sign the medication spreadsheet and obtain their medication.

Chilean customs laws do not restrict the amount of personal medications hand-carried through Chile and participants that are deploying through Chile can hand carry the amount of medication that they need for their deployment.

Remember that you will have to clear customs in New Zealand to reenter the country on redeployment and the same restrictions on the quantity of medications will apply. If you have an excess amount on redeployment, mail the excess amount to yourself at home before leaving Antarctica.

If you have any questions about the procedure for transporting your prescription medications to Antarctica, contact the Medical Department at RPSC, 1.800.688.8606, option 3 on the menu.

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