

First Aid

Basic Field First Aid Manual

This First Aid Manual describes some of the medical issues that may be encountered in an Antarctic field environment. This is not an exhaustive manual, but it will serve as a guide to those with limited medical background to help treat their companions. It should be read in advance to help field team members recognize dangerous situations and help prevent injuries from occurring or becoming more serious if they do occur.

Antarctica is an inherently risky environment. Participants are often dehydrated, mildly hypothermic, and sleep deprived. This can lead to an increase in accidents. It is essential that all team members slow down, assess each task, and ensure the safety of the team.

The medical kit provided to a team depends on the team's activities, locations, and needs. Team members should familiarize themselves with the contents of the kit – before there is a need to use it.

Hygiene

Occasionally, people deploying to the deep field use the remote environment as an excuse to abstain from normal hygiene and sanitation. Extreme cold temperatures, lack of running water, and communal living make bathing, brushing teeth, and basic hygiene a chore.

People must continue with a normal hygiene routine to avoid painful and distracting issues that can occur in the absence of cleanliness, such as dental abscesses, gum pain, yeast infections, skin rashes, cracked skin, and trench foot.

Wet-wipe and sponge baths are the norm. If wet wipes are preferred, personnel should bring enough for the anticipated time in the field. Blanket partitions can be set up in large tents to create a semi-private space.

Sprains and Strains

Sprains and strains are the most common injuries in Antarctica. People must work carefully, thoughtfully, and deliberately to avoid them. A sprain is an injury that involves tearing the ligaments that help keep joints intact. A strain involves overstretching a muscle.

Sprain and Strain Signs and Symptoms

Sprains and strains will manifest as pain at the site of the injury that may radiate outward. There will also be swelling and discoloration.

Sprain and Strain Treatment

- R** Rest: Stop activity, make the patient comfortable, and set up shelter if necessary.
- I** Ice: Cool down the affected area with water, snow, or ice for approximately 15 minutes. Don't apply directly to the skin.
- C** Compression: Wrap the affected area with an elastic bandage.
- E** Elevation: Keep the affected limb raised to reduce swelling.

Immobilize the Joint

Fingers: Place gauze between the injured finger and the uninjured finger next to it. Buddy tape the fingers in two places (but not over a joint, so the fingers can be flexed and extended).

Wrist: If swollen, splint it using a SAM™ splint or materials on hand. If it is not swollen, or when the swelling subsides, bandage it from the hand to below the elbow with an elastic (ACE™) bandage. The patient should exercise the fingers, elbow, and shoulder regularly.

Knee: If it is very swollen, suspect a more serious injury. With the knee in a neutral position (slightly bent, between full extension and flexion) wrap a thick layer of cotton wool around the leg from mid-calf to mid-thigh. Apply a SAM splint on the back of the leg to keep it in position, and hold the splint in place with an elastic bandage.

Ankle: Remove the boot. Place the foot in a position of comfort. Using an elastic or tape bandage, wrap from the toes to just below the knee, keeping the foot up and covering all the skin. If the ankle is very swollen, especially on both sides, then a more severe injury should be suspected.

Caution: Do not wrap bandages too tightly. Toes must remain warm and pink and have feeling.

Bleeding and Wounds

External Bleeding and Wound Treatment

Stop the bleeding with a gloved hand or finger(s), using well-aimed, direct pressure. Once bleeding has been controlled, clean the wound with mild soap and potable water, or use Hibiclens® or povidone-iodine. Remove any obvious debris with tweezers or forceps and irrigate the wound copiously with high pressure irrigation. If high pressure irrigation is not available, continue to flush the wound until no debris is seen. Never use alcohol to clean a wound. Once the wound is clean, apply an antibiotic ointment, cover the wound with a clean dressing (sterile, if possible), and tape it in place. All wounds

should be cleaned twice a day and a new, clean dressing applied. If a wound is contaminated and there is concern about infection, medical personnel should be advised.

Impaled Objects

If an impaled object will interfere with transport and is not in an eye, chest, or abdomen, it can be carefully removed. No objects impaled in an eye should be removed. Instead both eyes should be patched and padding should be placed around the injured eye to support it and decrease movement until it can be safely removed in a controlled environment.

Carbon Monoxide Poisoning

Carbon monoxide (CO) can be produced by burning anything containing carbon, including fuel in open flames, gas cookers, or engines. CO poisons by attaching itself to the hemoglobin in the blood. It does so about 200 times more readily than oxygen, easily displacing inhaled oxygen. When enough hemoglobin is compromised, the remainder cannot carry sufficient oxygen to the rest of the body. Oxygen starvation of the brain will cause permanent damage, even if the patient is revived. Furthermore, the toxicity of CO increases with altitude.

Carbon Monoxide Signs and Symptoms

Often there are none. However, the following may occur:

- Slight headache
- Shortness of breath
- Panting
- Confusion
- Nausea
- Chest pains
- Dimming of vision
- Feelings of exhilaration or lassitude
- Dizziness
- Excessive yawning
- Ringing in the ears

In latter stages, the patient's skin color becomes pink to cherry red, though the red and yellow polar tents will make it difficult to notice any skin color change. Unconsciousness and death is often rapid.

Carbon Monoxide Treatment

If carbon monoxide poisoning is suspected:

- Immediately move the patient to fresh air or to an uncontaminated tent.
- Provide the patient with 100% oxygen, if available.
- Contact Medical and describe the incident and symptoms.
- Keep the patient quiet and resting for at least eight hours. Early exertion may cause cardiac arrest.
- If breathing stops, commence cardio-pulmonary resuscitation (CPR).

Carbon Monoxide Poisoning Prevention

Field parties must utilize the issued carbon monoxide detector. Team members must ensure there is adequate ventilation at all times in all buildings, shelters, and vehicles. Tents or other shelters must be thoroughly ventilated during cooking and before personnel bed down each night.

Hypothermia

Hypothermia occurs when a person's core temperature is reduced to a level where normal brain and body functions are impaired. Hypothermia progressively affects a person's judgment, perception, and coordination.

Wind greatly increases the chilling effect of cold. The faster the air moves, the more heat it can drag away. This is wind chill. The cooling effects of air can be seen by referring to the wind chill chart in the reference section.

Wet clothes, from sweating, marine dampness, or precipitation also cause chilling. Finally, fatigue reduces a person's ability to protect himself or herself, and it diminishes the physiological capacity to thermoregulate and maintain a proper core temperature.

Hypothermia Prevention

Hypothermia is prevented by wearing the proper clothing and by supporting and regulating the body's heat production. Proper nutrition and hydration help prevent hypothermia, and adequate rest is critical. Exhaustion promotes the onset of hypothermia and precedes its development in almost all cases. The tendency to "press on" has led to many avoidable deaths.

A layered clothing system should be employed, where layers can be

added or removed as needed. Field team members should not allow themselves to get either cold or hot and sweaty.

Hypothermia Signs and Symptoms

Hypothermia manifests in three stages:

- **Mild:** This stage includes shivering and personality changes. A person may become withdrawn, apathetic, or irritable. There is a loss of fine motor control. Field party members should always be on the alert for a team member displaying the “umbles”: stumbles, mumbles, fumbles, and grumbles.
- **Moderate:** At this stage, hypothermia progresses to violent shivering, altered mental states, and disorientation. Moderate hypothermia also manifests as a loss of gross motor skills, such as balance and coordination (ataxia).
- **Severe:** In this stage, shivering stops and the level of responsiveness drops. A person becomes unresponsive and may appear dead, with very slow and weak pulse and respiration rates. An individual will appear cold and blue, and he or she may have associated frostbite. Cardiac arrest is possible.

Hypothermia Treatment

The essential and immediate treatment for hypothermia is to prevent further heat loss by insulating the body. If any member of a field party shows signs of developing hypothermia, the individual must be moved into shelter immediately.

Mild hypothermia may be turned around quickly. A person with this condition should be:

- Helped into additional clothing layers and fed quick-energy carbohydrates and warm, sweet drinks, such as hot chocolate or warm electrolyte beverages.
- Encouraged to run in place or perform another exercise.
- Provided dry clothes, if necessary, and external heat sources, such as hot pads or water bottles filled with warm fluid.

If moderate to severe hypothermia is suspected, contact Medical immediately. The patient should be placed in a hypothermia wrap, which is a bundle made of sleeping bags and reflective sheeting, with warm heat sources on the patient's neck, armpits and groin. (Body-to-body rewarming in a sleeping bag is of limited usefulness and may result in two cold people.)

Frostbite

Frostbite is freezing of body tissue. Areas most at risk are the extremities and exposed skin (ears, nose, face). Factors that lead to frostbite are:

- Previous frostbite injury
- Cold temperatures and wind
- High altitude
- Overexertion (fatigue and dehydration)
- Touching metal or super-cooled liquid fuel
- Poor circulation
- Constrictive clothing or footwear
- Underlying medical problems
- Hypothermia

Frostbite Prevention

Frostbite is almost always avoidable. A buddy system should be established to observe any whitening on the face or ears of a companion. If any whitening or tingling of the face, ears, feet, or hands occurs, these areas should be warmed immediately. Socks and boots should fit snugly, with no points of tightness. Glove liners should be worn so that skin is never exposed when performing work that can't be done in heavy gloves.

Strenuous exercise should be avoided in extreme cold, particularly at high altitudes. Very cold air brought too rapidly into the lungs will chill the body's core. Perspiration under conditions of extreme cold should be avoided. Perspiration evaporates, chilling the body.

Plenty of food should be consumed to produce maximum output of body heat. Food items in cold weather should tend toward quick energy first, such as fats and carbohydrates, and then proteins. In addition, personnel should drink two to three liters of water per day to stay hydrated.

Avoid the following, which can promote frostbite:

- Smoking
- Alcohol
- Excessive coffee and tea drinking
- Excessive fatigue
- Improper or inadequate eating habits
- Unnecessary medication
- Exposure to fuel, especially on bare skin

Mild Frostbite Signs and Symptoms (pre-thaw)

There is an uncomfortable sensation of coldness, followed by numbness and skin anesthesia. In superficial frostbite (frost nip), the skin turns red, then pale or waxy-white. In partial thickness frostbite, the skin becomes cold and frozen on the surface, but remains soft and pliable when gently pressed.

Full-Thickness Frostbite Signs and Symptoms (pre-thaw)

The skin is waxy-white. Toes and fingers become solid (like a piece of chicken taken from the freezer). They feel wooden, and the skin cannot be rolled over the bone.

Full-Thickness Frostbite Signs and Symptoms (post-thaw)

The entire hand or foot swells, which limits the mobility of the injured toes or fingers. Blue, violet, or grey (the worst) discoloration appears. After two days, the patient suffers severe throbbing and shooting pains. Huge blisters form, usually between the third and seventh day. These usually dry up, blacken, and slough off, leaving an exceptionally sensitive thin, red layer of new skin.

Frostbite Treatment

Frostbite should not be rubbed, as this will cause additional tissue damage from the ice crystals within. Treatment in the field for anything beyond superficial frostbite is full of challenges and additional risk for the patient. Prevention is paramount!

Superficial Frostbite Treatment (Frost Nip)

Superficial frostbite can be treated effectively in the field. If noticed promptly, it can usually be treated by the firm, steady (no rubbing) pressure of a warm hand or by blowing onto it with warm breath. Superficially frostbitten feet are best treated by removing the patient's footwear the moment there is any suspicion of danger and rewarming the feet immediately. After warming is complete, the affected feet should be covered with dry socks. If footwear is replaced, it should be done loosely to ensure adequate circulation and warmth is maintained.

Partial-Thickness Frostbite Treatment

Partial-thickness frostbite of a small body area should be reheated in water that is between 42°C and 43°C (107°F and 109°F). Water at higher temperatures can burn the skin. The injury should then be treated to prevent infection, bandaged for protection, and kept warm. Refreezing must be prevented, as this will cause major additional damage. Medical personnel should be consulted if necessary.

Full-Thickness Frostbite Treatment

Because of limited resources in the field, full-thickness frostbite is a major medical emergency. Medical personnel should be contacted immediately for consultation and to discuss evacuation plans. Re-warming should not be attempted in the field if there is any possibility that the affected part may become refrozen. In such cases, the affected part must be kept frozen until it can be re-warmed rapidly under controlled conditions.

If re-warming is recommended, remove jewelry (especially rings) if possible. Immerse the injured part in 42°C to 43°C (107°F to 109°F) water, continually adding water and stirring it to maintain a constant temperature, until the digital tips (ends of fingers or toes) turn pink or burgundy red. This takes approximately 20 minutes to one hour and is extremely painful. When adding water, ensure that it is not more than 44°C and is not poured directly over the injured body part.

Significant pain, swelling, and blistering will develop after re-warming. Do not puncture the blisters, and do not allow the injury to re-freeze.

Protect the thawed injury with sterile, soft, fluffy dressings. Separate toes and fingers with cotton wool. Wrap the whole part lightly with gauze bandages. Do not change dressings unless they get dirty, and never rub the skin. Keep the patient and the injured body part warm. Pain medication will be needed, and medical personnel will advise on specific type and dose. In addition:

- Elevate the injured limb(s)
- Commence antibiotic treatment, per medical personnel instruction
- Keep the patient absolutely still, lying down
- Evacuate to a medical facility as quickly as possible

Immersion Foot

Immersion foot, or trench foot, is a medical condition caused by prolonged exposure to cold, damp, and unsanitary conditions.

Immersion Foot Prevention

Feet should be kept warm and dry by wearing protective footwear, and they should be checked frequently during wet and cold conditions. Footwear should not be constrictive, and it should be cleaned and dried at every opportunity. In the field, extra pairs of dry socks should be carried next to the abdomen under the shirt. Wet socks

can be dried by placing them next to the abdomen, either inside or outside the shirt.

If feet get wet, they should be dried as soon as possible. They can be warmed by the hands. Foot powder should be applied and dry socks put on. If it is necessary to wear wet socks and footwear for any length of time, then the feet should be exercised at regular intervals by wriggling the toes and bending the ankles.

Immersion Foot Signs and Symptoms

The area becomes cold, swollen, waxy-white and mottled with burgundy-to-blue splotches. The skin becomes numb, deep sensation is lost, and movement of the affected area becomes difficult.

If allowed to continue untreated, the area becomes red, hot, and swollen, and blisters appear. The victim experiences constant throbbing and a burning sensation. Skin numbness is aggravated by heat and relieved by cold.

Immersion Foot Treatment

Remove wet footwear. Gently and rapidly rewarm the affected foot by immersing it in warm water (about 40°C). Once the foot is warmed, dry it completely and elevate it in a warm room. Swaddle it with clean bandages or cloth to keep it warm and clean.

The injury must not be rubbed or massaged. Blisters should be kept clean and dry. Do not apply ointments. Two 200 mg ibuprofen tablets every four hours may be administered for pain, if required. Evacuate the victim to a medical facility.

Eye Injuries

Tent Eye

Antarctica's extreme low humidity may cause the film of tears protecting the eye to dry up, making the cornea susceptible to damage from stove fumes in the tent. The condition can be treated by applying Chlorsig® ointment to the eye when it occurs and/or before going to sleep.

Snow Blindness

Snow blindness is caused by ultraviolet (UV) light burning the eyes. The danger of snow blindness is greatest not on clear, bright days but on dull, cloudy (whiteout) days, when crystalline snow mist is present. There is no warning that damage has been done until the symptoms begin to appear two to twelve hours after exposure.

Snow Blindness Signs and Symptoms

Snow blindness manifests as intensely painful, red, watering eyes that are sensitive to light. The victim will also feel as though there is grit in the eyes.

Snow Blindness Treatment

A single episode of snow blindness may last up to five days, even while being treated. The eyes should be rested for at least 24 hours. That means closing them and covering them with a non-fluffy pad. If the temperature is above freezing, a cold compress may be placed over the affected eyes to relieve pain. Medical should be contacted for treatment recommendations and possible medications. Medical personnel may recommend providing the victim two tablets of ibuprofen (400 mg) every four hours, as required, or putting Chlorsig® ointment on the eyes every three hours.

Snow Blindness Prevention

This condition must be avoided, as it is a crippling injury that may seriously delay a field party. Team members should wear dark, UV-protective glasses or goggles with the appropriate lenses (not yellow) at all times when in the field, especially on overcast days.

Skin Injuries

Sunburn and Windburn

Direct exposure to the sun, especially when it is very windy or the body is wet with sweat, can result in a sunburn and chaffed skin. Because the Antarctic air is cleaner and thinner, there is greater ultra-violet penetration, so sunburn can occur even on overcast days. If sunburn occurs, apply aloe vera gel to the burn and provide the victim 400 mg of ibuprofen every four hours, as necessary, to relieve pain.

Sunburn and Windburn Prevention

Prevent sunburn by applying sunscreen ChapStick® to the lips and regular sunscreen to other areas of exposed skin. Covering the face with a balaclava will prevent both sunburn and windburn to this frequently exposed area.

Dental Health

Oral Hygiene

Oral hygiene can be inconvenient in the field, but it is just as impor-

tant as bodily hygiene. Failure to maintain good oral hygiene may result in increased tooth decay (especially around the edges of fillings) and gingivitis. Ideally, teeth must be brushed after every meal, with snow if no water is available. Use toothpicks or waxed dental floss to clean gaps between the teeth that are hard to clean with the brush.

Controlled Medications

Issue of Restricted Drugs

The Peninsula field supervisor issues a field medication kit containing over-the-counter, prescription, and controlled medications (restricted drugs) to each designated field party medical lead. The kit is the responsibility of this person. The medical lead (or any USAP participant) must contact a station doctor for consultation and authorization before administering any medication. Always check for any known allergies before administering drugs.

Chain of Custody

The Peninsula field supervisor will fill out a controlled-drug Chain of Custody form and provide it to the field medical lead. The lead must account for all controlled substances when the kit is checked out, weekly, and when the kit is returned. If the lead departs before the end of the season, he or she must complete a new Chain of Custody form and count the medications before transferring the kit to another person. At the end of the season, the medical kit, controlled medications, and a completed chain-of-custody must be returned to the Peninsula field supervisor.

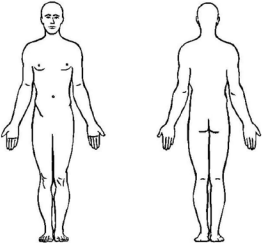
SOAP NOTE

SCENE

S Symptoms		A	Allergies
		M	Medications
		P	Past History
		L	Last Meal
		E	Events

OBJECTIVE

EXAM:

	<h4>VITAL SIGNS</h4> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Time</th> <th>Pulse</th> <th>Resp.</th> <th>B/P</th> <th>Skin</th> <th>Temp.</th> <th>AVPU</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td style="text-align: center;">/</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td style="text-align: center;">/</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td style="text-align: center;">/</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td style="text-align: center;">/</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td style="text-align: center;">/</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td style="text-align: center;">/</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td style="text-align: center;">/</td><td></td><td></td><td></td></tr> </tbody> </table>	Time	Pulse	Resp.	B/P	Skin	Temp.	AVPU				/							/							/							/							/							/							/			
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ASSESSMENT AND TREATMENT PLAN	
A = Assessment (Problem List)	P = Treatment Plan

