

Potential Cliff Camp Illnesses

Wednesday, September 26, 2018

Recently several people have expressed concerns about illness at Cliff Camp.

In my 60 years at Cliff Camp, the worst injuries were a sprained ankle, and emergency evacs for heart palpitations and rheumatic fever. Please note that the open area between the campfire and the large rock is cleared and approved for helicopter evacuation.

Many scrapes, scratches, cuts, and insect bites; occasional bouts of headache, diarrhea, and constipation; as well as occasional bear & rattlesnake sightings. No food or water poisoning concerns until now. Let me outline the many possible concern areas.

There are many sources of potential concerns: insects, animals, plants, air-borne, food-borne, water-borne, and hygiene.

- Common illnesses such as aches & pains, allergies, colds, flu, diarrhea, & constipation. Often these are brought with us from home. However, unusual exercise and diet may be root causes for much of the rest. Various medications for these common maladies are stocked in the medicine cabinet.
- Insects, animals and plants are obvious and generally do not worry anyone significantly.
- Food-borne illnesses (food poisonings) are generally the same risk we all deal with at home except for challenges due to refrigeration and improper cooking.
- Water-borne diseases in the Sierra are pretty much limited to two kinds of parasites that occasionally get into the water supply from animal feces. These are *Cryptosporidium* and *Giardia*.
- Proper hygiene is known to be the most significant prevention for most illnesses. Regularly washing hands, utensils, and food preparation surfaces with soap and warm water or disinfectants is crucial.

Insect, animal, and plant hazards

Ants sometimes bite, wasps & scorpions can sting, and mosquitoes leave welts. Of course mosquitoes can be vectors for worse things. Ticks occasionally show up (especially on deer hunters). Plants are seldom a problem other than for scratches unless one eats the nut-like bulb of the Death Camass flower in the meadow. Rattlesnakes are the best known hazard. However, I am unaware of anyone bitten in the 60 years I have been going to Cliff Camp. Bears, raccoons, coyotes, and rabid squirrels could potentially be a problem. Even mice can be hazardous. No known mouse-caused illness has ever been reported at cliff camp.

Insect bites and stings can usually be treated with topical ammonia or antihistamine or with antihistamine tablets, such as Benadryl (diphenhydramine). These are stocked in the medicine cabinet. Yellow-jacket wasp stings are painful but usually not life threatening. Observation and prompt use of antihistamine is advised.

The Western Forest Scorpion produces very painful stings usually subsiding within an hour and very seldom life threatening.

The White footed mouse is known for a variety of hazards. Most are allergies, and contamination of food or cooking surfaces is possible. They are occasionally responsible for outbreaks of hantavirus. This virus is mainly transmitted to people when fresh rodent urine, droppings, or nesting materials are stirred up, become airborne and are breathed in by people. Symptoms take 1 to 5 weeks to develop.

From <<https://www.pestworld.org/news-hub/pest-health-hub/health-hazards-posed-by-rodents/>>

When cleaning up mouse pellets & shredded nesting be sure to use paper towels moistened with disinfectant and dispose in a fire.

Summary

Common sense is probably all that is needed. However, a fairly complete set of first aid materials and common medicines and antiseptics are stocked at Cliff Camp.

Food-borne illnesses

Are caused by eating foods contaminated with infectious organisms (i.e bacteria, viruses, or parasites) or their toxins. Symptoms, usually starting within hours of eating contaminated food, often include nausea, vomiting, or diarrhea. Most often, food poisoning is mild and resolves within 2 to 72 hours without treatment. But some people, especially with weakened immune systems, need to go to the hospital.

News reports are full of reported food contaminations (e.g. restaurant food poisoning, vegetables with E. Coli, and chicken with Salmonella). These risks we face every day with relative confidence. A food-borne illness at Cliff Camp, would most likely be due to the Clostridium bacterium. This can result from improperly refrigerated raw meats, stews, or gravies; also undercooking already contaminated meats such as poultry. Insufficient hygiene often may result in cross-contamination from hands, knives or preparation surfaces.

<https://www.fda.gov/Food/FoodborneIllnessContaminants/FoodborneIllnessesNeedToKnow/default.htm>

The USDA strongly recommends:

Refrigeration	<40°F
Cooked foods kept warm (Temperatures between 40 and 140 should not exist longer than 2 hours.)	>140
Minimum temperatures for cooked meats	
Beef	135
Ground Beef	160
Chicken and Turkey	165
Port	145

A very precise meat thermometer ("DOT") and an infrared thermometer are in the drawer nearest the stove.

https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/safe-food-handling/safe-minimum-internal-temperature-chart/ct_index

Many foods, even after opening, do not need refrigeration for food safety. However, after long storage, their taste, odor, or texture may decline. Opened Mayonnaise, salad dressing, peanut butter, butter, ketchup, mustard, pickles, syrup, and honey to mention a few, do not present a food poisoning hazard. However, if they grow mold, or smell rancid they should be discarded mostly because of a quality issue not a safety issue.

Many people use ice-chests incorrectly. Most foods do not spoil at room temperature. However, of those that do, they need to be kept below 40 degrees. At best, below an ice layer, the temperature may be as low as 32 degrees. However most of the ice-chest will have temperatures much above that.

Summary

No one has yet reported a case of food poisoning at Cliff Camp.

Simple procedures can probably keep our record free of any future problems.

Monitoring ice-chest and cooking temperatures as well as frequent and appropriate hygiene are probably all that is necessary.

Water-borne illnesses

Wilderness Acquired Diarrhea (WAD) can result from drinking water that is polluted with biologics (i.e. bacteria, viruses, or protozoa) or chemicals (e.g. lead or pesticides). Chemical pollution from a remote spring like ours is very unlikely.

Cryptosporidium and Giardia

Common Infectious biologics in the Sierra are almost exclusively limited to cysts of *Cryptosporidium* and more rarely *Giardia*. Both are due to fecal contamination of the water supply by animals.

Hiking above the spring shows that no surface water is directly flowing into our spring system and the Forest Service Work Station (with stock corrals) is located over 1/2 mile away.

Infection is through contaminated material such as earth, water, uncooked or cross-contaminated food that has been in contact with the feces of an infected individual or animal. Contact must then be transferred to the mouth and swallowed. It is especially prevalent amongst those in regular contact with bodies of fresh water including recreational water such as swimming pools and lakes. Infection may occur not only by drinking water contaminated with animal feces. Even more commonly it is contracted through brushing teeth, bathing, swimming, digging, dust, or not thoroughly washing hands or utensils.

Symptoms and Treatment

The average incubation period of either cryptosporidium or giardia is 5-10 days. It doesn't happen immediately upon ingestion. Typically a hiker abruptly experiences four or five watery bowel movements each day often accompanied by nausea, vomiting, abdominal cramping, bloating, low fever, urgency, and malaise. This usually spontaneously resolves within 2 weeks unless there is blood, high fever, or dehydration. Life-threatening illness resulting from Wilderness Acquired Diarrhea (WAD) is rare but can occur in people with weakened immune systems.

https://en.wikipedia.org/wiki/Wilderness-acquired_diarrhea

Prevention

A study by the Journal of Travel Medicine, January 2004, shows that "good hygiene" (routine handwashing with soap and water post-defecation as well as routine cleaning of utensils with warm, soapy water) was much more effective than treating drinking water. From

<<https://academic.oup.com/jtm/article/11/1/27/1802290>>

- Neither *cryptosporidium* nor *giardia* is affected by iodine or chlorine tablets.
- Boiling for more than 3 minutes is effective.
- A filter (good down to at largest 3 μ m) will remove these cysts. This is pretty fine and usually requires a pump to maintain high pressure.
- Reverse Osmosis
- SODIS, Solar Water Disinfection - Water in a transparent PET bottle, oxygenated by shaking, and left in sunlight for 6-24 hours
- Distillation
- Slow Sand Filtration (usually at least 3 feet of fine sand to percolate through).
- However exposure to UV-C light (SteriPen) has been found to be very effective in inactivating these cysts.

Different types of water sources may have different levels of contamination:

- More contamination may be in water that
 - a. likely could have passed through an area subject to heavy human or animal use
 - b. is cloudy, has surface foam, or has some other suspicious appearance.
- Less contamination may be in water from

- a. springs (provided the true source is not surface water a short distance above)
- b. large streams (those entering from the side may have less contamination than those paralleling the trail)
- c. fast-flowing streams
- d. higher elevations
- e. lakes with undisturbed sediments (10 days undisturbed water storage can result in 75-99% removal of coliform bacteria by settling to the bottom)
- f. freshly melted snow
- g. deep wells (provided they aren't subject to contamination from surface runoff)
- h. regions where there was a heavy snow year when streams run full and long compared to dry years.

Summary

Only one incident of suspected WAD at Cliff Camp has been reported. There are many possible reasons for diarrhea besides water contamination. The report indicated that the onset was immediate, probably ruling out Crypto or Giardia and being more likely a food-borne illness.

Our spring appears to meet all of the criteria for safe water but this is not guaranteed.

Those who are still worried (especially with weakened immune systems or pregnancy) would be best to:

Use UV light (SteriPen) or boiling to sterilize drinking water

Also sterilize water used for rinsing food, utensils, brushing teeth, or showering

Exercise "Good Hygiene" - diligent washing of hands and cleaning utensils with sterilized water.