

10 BASE CAMP HYGIENE AND HEALTH

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Unstinting efforts to maintain a high standard of hygiene will contribute to a lower incidence of gastrointestinal problems and prevent the loss of working person-hours during an expedition. “Be obsessive about camp hygiene.” Routine in camp life pays great dividends and responsibility for hygiene, cleaning and safety chores may have to be organised by a strict rota to ensure that standards are maintained throughout the project.

If you cannot help in the choice of a site for base camp, you should at least be aware of its characteristics and therefore any risks and hazards it presents. In planning the layout of the camp, particular attention should be given to the following:

- Water supply
- Latrines
- Areas for washing up, washing clothes, ablutions
- Drains
- Kitchen (smoke, smell and fire risk)
- Food storage
- Rubbish disposal
- Fuel dump and fire precautions
- Areas for eating, working, sleeping and relaxing
- Medical area tent/hut (on the edge of the camp for privacy).

Water supply

Be unremitting in your efforts to maintain a high standard of safe water (see Chapter 11). Find the best source of water. It may, for example, be possible to use rain-water. Before departure, discuss with the leader what safe water regime (rules) needs to be established. On a large expedition someone should be responsible for the water every day. This might be the responsibility of the medical officer (MO) throughout the project, or be organised in rotation, but everyone must be aware of

how the system operates. Every member of the expedition must know the difference between safe and unpurified water containers: consider using a simple system of markers. They must also know which source to use for which purpose: for example, not to clean teeth, or wash with untreated water to avoid schistosomiasis contamination.

People use a lot of water. Water will be needed for drinking, washing (people, clothes, cutlery and crockery), cooking, vehicles and sometimes animals. Wherever the expedition – in desert, tropical forest, tundra or at altitude – everyone should drink enough daily fluid for him or her to pass 1 litre of clear urine. This means that their intake will change from day to day depending on workload and speed of acclimatisation.

- Do not underestimate the time it takes to purify water every day.
- Carrying water is hard work. Make sure that your containers are small enough to be carried without too much effort.
- Do not embarrass the local people by making unreasonable demands on limited supplies of water, or be seen to waste it.
- Do not allow expedition members to pollute water supplies, your own or other people's, by being thoughtless.
- Have a back-up system for treating water. All too often the best-made plans go wrong or break down in the field.

Latrines are the subject of much interest, concern and a fair amount of embarrassed mirth. People's bowel habits change on expeditions, one way or the other, and often dramatically. Once again it is necessary to plan which latrine system is appropriate for your expedition. Mobile and short-stay sub-camps can use an earth pit or trench. Sub-camps should dig a trench at least 1.25m deep and about 30cm wide. It may be necessary to construct a grab rail and foot-rest that can be repositioned. Each time the latrine is used, the user should shovel over a coverage of earth from the pile on the edge of the trench. Ash from fires may also be used to help prevent smells.

Long-drop latrines for static base camps should be at least 4m deep and have a seat and fly-proof cover placed over the top. In environments where the soil is unstable, such as sandy desert, consider using old oil drums (lid and base removed and perforated holes halfway up) to shore up the sides, adding a packing of sticks between the edges to stop loose sand filling the drums. Chemical toilets (Elsan type) are not often possible for the expedition camp, but if you are lucky enough to have them there must be adequate provision for the disposal of the contents in a sewage system or deep pit that can be covered. All latrines must be constructed more than 50m away from wells or other water supplies and kitchens.

It is difficult to calculate how many latrines you will need for a big group in a static camp, especially if there are both men and women on the expedition. The efficient working of any camp toilet is of course influenced by the environmental conditions

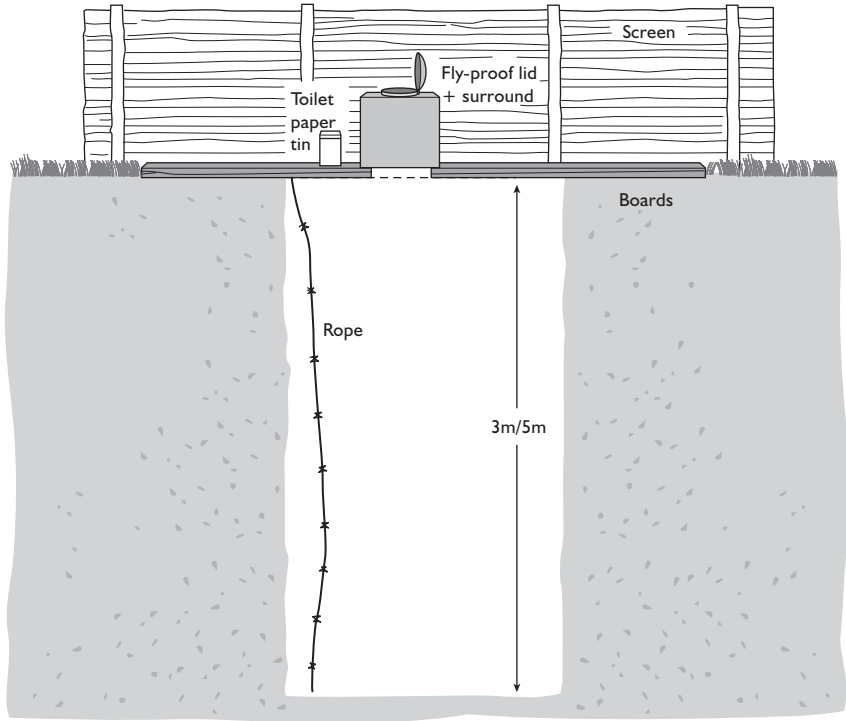


Figure 10.1 *Long-drop latrine for static camp*

of the camp – drainage, porosity of the soil and humidity – and by the number of people using it, so there can be no set formula to help calculate how many to construct. As a rough guide, one long drop for ten people should last two months. A large static camp of some duration may require new long drops to be constructed during the project. If flies become a problem a covering of earth can be shovelled into the long drop after each use, as for an earth trench. Storing toilet paper in a tin stops it blowing away, keeps it dry and keeps the ants out. Arrange hand-washing facilities near to the toilets (the bowl should be a different colour from the ones for kitchen use) and fix the soap on a string. You may need to establish procedures for the disposal of paper, tampons and so on away from the latrine area. Expert advice must be sought by women travelling in areas such as North America where bears are attracted by menstrual flow. Be aware of any expedition members' religious requirements that need catering for when setting up latrines. If local people are to use your facility make sure that they understand how to do so. Problems arise if people try to use Western-style toilets in the local way.

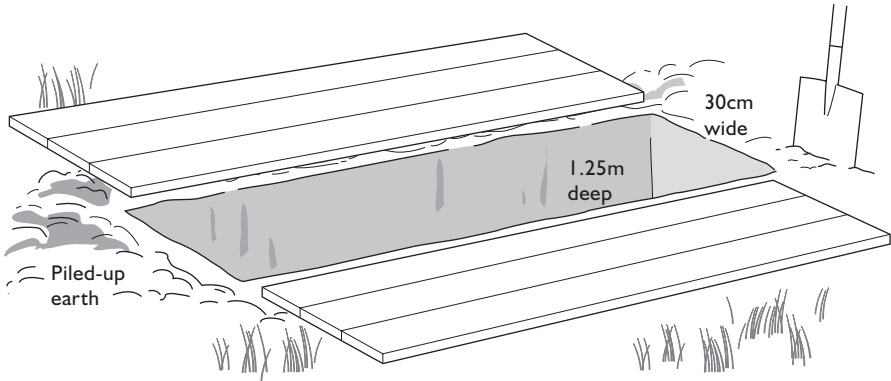


Figure 10.2 *Earth pit or trench latrine for small, mobile camps*

The latrine area needs to be cleaned and dried daily. A long-handled brush is useful for scrubbing the seat with soapy water. Pouring disinfectant down the long drop does not reduce infection and delays decomposition. Try to keep the latrines as dry as possible to discourage flies. Spend time at the beginning of the expedition making sure that seats and lids fit and close properly, making them as fly-proof as possible.

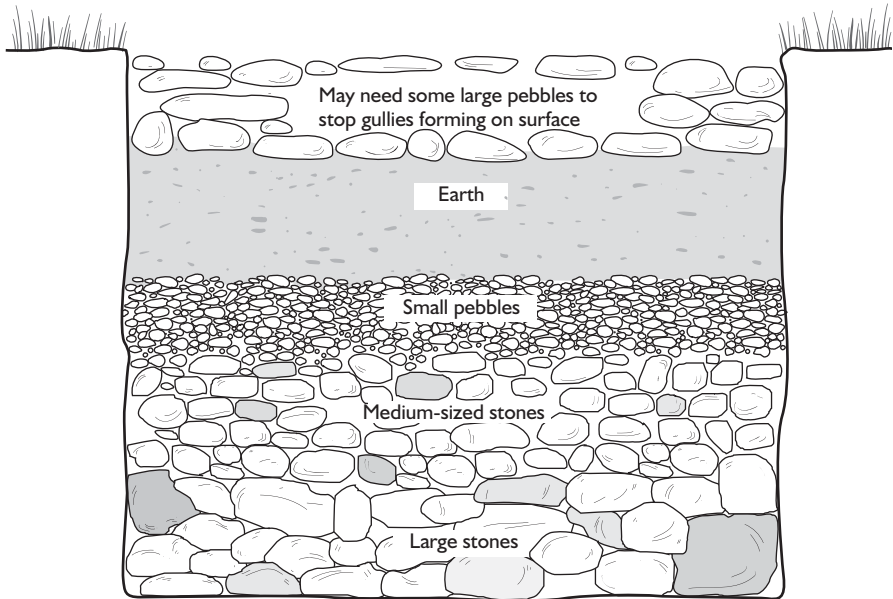


Figure 10.3 *A soak-away pit*

Whatever type of latrine you use you must understand its workings so that any malfunctions can be rectified. It is not a pleasant task to mend or reconstruct toilets when they are in operation. Check at regular intervals that the system is working and is safe. Boards can become slippery, rotten and damaged, and long drop sides cave in. It may be prudent to have a fixed rope down inside the long drop as a safety line. Mesh-covered duckboards around the toilet can be helpful, especially in muddy camps, as inevitably the area becomes squelchy. Ensure the latrine site is clearly marked for night-time visits. Encourage everyone to use a torch to check, particularly under the seats, as snakes and other creatures are frequent visitors to latrines.

If your expedition has built the latrines for your camps you must have a plan for dealing with the area after the expedition is over, leaving it safe and hygienic. This will require some thought and time if the camp has been of any size or duration. In areas of permanent frost, where natural biological breakdown of sewage is impossible, all camp excreta will have to be stored and then taken away.

TABLE 10.1 CARDINAL RULES FOR LATRINE HYGIENE

1. Clean seat daily; check operation and safety
2. Keep dry; do not pour down disinfectant
3. Ensure seats and covers are fly-proof
4. Beware of snakes; use a torch at night
5. Ensure adequate hand-washing facilities are available close by

Drains

Even small mobile camps will need to dispose of dirty water somewhere. Without adequate drains your static camp will soon become smelly, and stagnant water is a breeding ground for mosquitoes and infectious diseases. Constructing drains is a time-consuming process. By their very nature they have a tendency to be regularly washed away or become clogged up. For camps that will be used for any length of time, building good kitchen drains and grease traps will pay great dividends in the long term, provided they are used and maintained properly.

Grease traps and soak-aways can get clogged up quickly by a surface layer of food particles, causing the whole system to break down. A good filter, which is small enough to hold back rice and other particles and can easily be cleaned, is a great asset. Making a removable filter of plastic netting or mosquito screen over chicken wire is one possibility. Washing suds and toothpaste can cause problems as they form a slimy surface over soak-aways which then requires regular maintenance to clear.

If you are constructing an improvised shower you will need a mesh-covered duckboard to stand on and a drain and soak-away underneath.

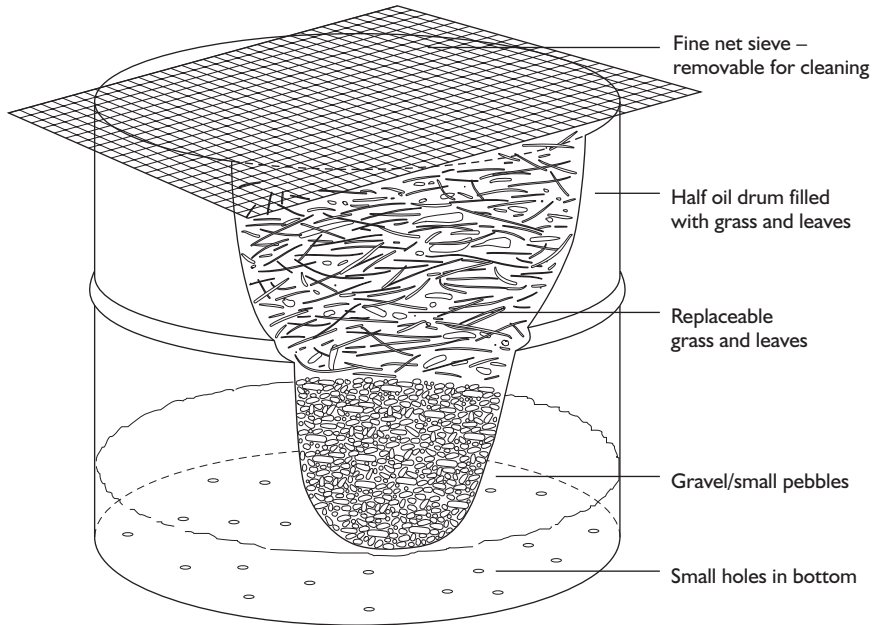


Figure 10.4 *A grease trap*

Rubbish

Rubbish disposal should be tackled as a daily chore to prevent smell, flies and infectious diseases. Rubbish also attracts scavengers if not disposed of properly. It is advisable to burn everything (including the top layer of grass or leaves from the grease trap) before burying it in a deep pit or taking it away for disposal. This includes tins and glass as even hungry expedition members leave unpleasant scraps in the corners of sardine tins. Designate a site away from the main camp to be used as a burning area. A shallow pit may be used to contain the fire. Ensure that plastic and glass containers have had their lids removed prior to burning to prevent small explosions. Flatten things like tins with a mallet. It can be useful to dig a rubbish pit on a slight gradient to promote drainage of rainwater. Beware of using petrol to ignite fires.

Kitchen

Expedition diarrhoea is usually caused by bad hygiene. Again, unremitting efforts to keep a high standard of hygiene in the kitchen will help cut down the person-hours wasted suffering from gut infections. It is imperative that hands are washed prior to all work in the kitchen. One person must be in charge of organising the catering, so that there is no doubt whose responsibility it is to cook each day, and who is to keep the kitchen area clean and tidy. Decide who will do the washing up, where it will be

done, and how the cutlery and crockery are stored. On larger expeditions, members may be responsible for washing their own crockery and cutlery. Ensure that all dishes are washed immediately following meals to prevent the attraction of flies and other wildlife. Try, if possible, to wash up in hot water. Organise a clear washing routine, for example a hot soapy wash followed by a cold rinse and dry.

Many expeditions may not have a designated cook and different members of the team may be responsible for kitchen duties each day. Ensure that everyone is aware of the kitchen rules. A written list of the chores that must be completed each day should be available. For example, tabletops and food preparation areas need to be scrubbed daily, aprons washed, and cloths boiled and hung out in the sun to dry.

There must be firm rules about the cleaning and preparation of food, including the preparation of fresh fruit and salads; you may wish to ban lettuce, other broad-leaf vegetables and shellfish completely. Raw food must be prepared, washed or peeled away from already cooked food, taking special care with raw meat. This should be prepared with a separate chopping board and knife kept for this purpose. Food must be properly cooked, served hot on clean plates and eaten promptly; it must not be left lying around or reheated. Make sure the other expedition members know the risks from milk, ice cream, ice and so on, and which foods are unsafe if eaten away from camp.

You will need to consider how to store food. Rodents quickly appear in camp and can severely damage stores as well as transmit disease to humans; for example, the multimammate rat, *Mastomys natalensis*, urinates on food supplies and transmits Lassa fever in West Africa. Large and dangerous animals such as bears may be attracted to camps and vehicles by subtle food odours, with devastating consequences. Food storage in strong metal drums may be the only solution. Hanging insect-proof larder cupboards are useful as they can be packed flat. Refrigerators in the field (whether gas, paraffin or electrically operated) are seldom 100% reliable. They are usually unable to maintain the cold setting of a modern kitchen refrigerator, allowing disease organisms to multiply much faster. Scientific specimens may compete for space in the refrigerator with the food, beer and even the MO's drugs. This must be resisted at all costs. Scientific specimens must be kept in a separate refrigerator if they need to be kept at a low temperature. The camp kitchen refrigerator must be kept clean, with raw meat at the bottom and cooked food above. It must not be overfilled and the door must not be opened and closed too often.

If the expedition has the good fortune to have a cook, be vigilant about standards of hygiene. It is not safe to assume that your cook, whether local or expatriate, has any understanding of the principles of kitchen hygiene. Staphylococcal food poisoning usually results from contamination of, for example, chopping boards, by people harbouring bacteria in their noses. Always bear in mind the possibility that the cook may be a carrier of disease. Consider treating for worms and do not let someone who is ill do the cooking.

TABLE 10.2 CARDINAL RULES FOR KITCHEN HYGIENE

1. Wash hands and scrub nails with soap before starting any work in the kitchen
2. Keep fingernails short and cover wounds with a plaster
3. Wear clean clothes or an apron (available for kitchen use only)
4. Do not use the same chopping board or utensils for raw and cooked ingredients
5. Food should be eaten immediately after it is cooked or, if not, refrigerated or reheated to sterilising temperatures before being eaten

The cooks work long hard hours, getting up before the rest of the team and working late into the night. They are the heart of the expedition and perform a thankless task. On every expedition food will become the all-absorbing topic and higher on the agenda as time passes. However well you have planned to please everyone, there will always be complaints. The cooks can often become the whipping boys – they are moaned at if not actually abused – but an expedition cannot function without food. Cooks need support, and a show of thanks from other members of the team will be much appreciated.

Camp safety

Spend time in camp removing hazards – marking guy ropes and washing lines, fixing handrails or holds and tying back branches where people regularly work or pass. Before pitching tents, check the ground for scorpions (at night they can be made visible with ultraviolet light which makes them fluoresce green) and other biohazards. In some tropical countries, sleeping on the ground entails a definite risk of nocturnal snakebites, by kraits (in Asia) and spitting cobras (in Africa). The risk is reduced by tucking the mosquito net well in under the sleeping bag and by fitted groundsheets, and is eliminated by sleeping in a hammock or raised camp bed. Make sure everyone hangs and uses mosquito nets correctly.

Be aware of anyone using or storing dangerous chemicals. Anaesthetic agents for small mammals and formaldehyde are commonly used on expeditions. If firearms are to be used, training and safe storage must be rigorous. Be especially aware of any scientist working with dangerous specimens (alive or dead). No one should handle venomous animals without previous training. If, for example, a venomous snake is to be handled, advise that it be done early in the day; if anything untoward happens communications and, if necessary, evacuation, are far easier in daylight. Handling dangerous animals, chemicals or machinery must not be allowed after drinking alcohol.

Everyone should know where the camp first aid kit is kept, but make sure all medical equipment and drugs are stored securely. Everything should be packed and labelled clearly with its name, strength and batch numbers. There must be some system

for the resupply of individuals' first aid kits. This will enable the MO to keep account of what minor problems members are suffering from and, if necessary, to check wounds and to stop the medical stocks constantly being pilfered or bits of the evacuation kit (e.g., spare torch batteries) being "borrowed". Consider having a book for recording every piece of equipment or dose of drug issued. Make sure that those who are on regular medication know where their spare supply is kept.

Think about the fire risks and what fire-fighting methods are available to you, especially in the kitchen. A fire blanket is needed to deal with frying pan fat fires. Store fuel safely away from the main camping area. Fuel (i.e. lamp fuel) should not be kept in people's tents or in plastic containers. Money spent on clearly labelled metal cans is never wasted. In large camps the siting of the generator is important to reduce the effect of the noise and fumes. Make sure any electric cables and plugs are safe. Check these at regular intervals throughout the project.

TABLE 10.3 CARDINAL RULES FOR FIRE PREVENTION

1. Identify risks
2. Publicise extinguisher sites or sand buckets
3. Store fuel, clearly labelled, away from tents
4. Do not keep fuel in plastic containers
5. Regularly check plugs and cables

Remember that the risk assessment done during the planning stages of the expedition and the routine safety rules may need to be modified in the field. Keep a book at the base camp for people to record daily where they are going, with whom and their expected time of return. Try to make sure people have adequate clothing, food and kit for the environment and daily conditions.

Everyone should know the policy and procedure for a late or lost person (see Chapter 8).

Be aware of the first aid skills within the rest of the team. The acclimatisation period and time in base camp offer the opportunity to go over some basic first aid with expedition members, with special reference to local problems such as recognising and managing heat stroke or hypothermia. In the event of the MO having time away from camp for any reason, appoint a second-in-command.

Lastly, you should be aware of any local security risk, for example, driving after dark or whether it is safe to leave anyone alone in camp.

Camp life

A happy, relaxed atmosphere in camp can help support those who are feeling the loss

of their usual social props or missing their homes and families. Base camp should be a place for rest and healing, but birthdays in the field are a good excuse for a party to boost morale. The MO can also help morale by taking an interest in, and spending time with, members working on their projects. This will be much easier to achieve if the MO is seen to be mucking in with general camp duties where possible. But the MO must remain available at all times for consultation and be seen to have an unquestionable standard of confidentiality.

Communication with the outside world by letter, radio or phone is very important. Do not underestimate the disappointment if this breaks down.

Meal times are important focal points for everyone and give the MO a chance to check that all are happy and well. The setting of the meal times can be critical and it is always difficult to please everyone and fit in with their work. It is frustrating to have meals consistently late, forcing people to wait around. Young people need food regularly and in large amounts. There will be accidents if they get hungry and tired. Try not to let people skip meals, and if possible make packed lunches for them if their work means they cannot get back for meals.

TABLE 10.4 MEAL TIMES

1. Meal times are an important focal point
 2. The setting of meal times is important
 3. Young people need food regularly
 4. Make packed meals if away from base
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It is often necessary, on a long expedition, to identify one day of the week (say a Sunday) that is slightly different from the rest in some way, perhaps with breakfast half an hour later. This Sabbath is also useful for those taking weekly antimalarial prophylaxis: "Sunday is antimalarial day." The MO can be responsible for putting out the appropriate pills and seeing that everyone remembers to take them.

Do not forget that large numbers of local people waiting around camp to see the MO can create a risk to the camp hygiene.

Records

Keep details of expedition members and records of all medical consultations. You should already have with you or have taken a detailed medical history of each expedition member, and be aware of what he or she wishes to happen in case of an accident, fatal or otherwise. Hold contact details of members' next of kin and the circumstances in which they should be contacted. Have a secure system for storing notes.

If there is an accident write down what happened in great detail as soon as you

can. If you have planned how to cope when things go wrong and you stick to the rules you will not make matters worse. Clear and truthful information is vital. Make sure that the insurance companies are informed promptly. Never destroy any records.

Creating a happy camp life will help maintain the group through and during the aftermath of an accident, and keep it working together as a team for as long as is needed.

The end of the expedition

Lastly, remember to honour any commitment to sponsors and to thank all who have helped you in the host country and elsewhere. Make sure that all members know what to do if they fall ill after returning home, and the length of time for which this applies. Repeat antimalarial advice and check that everyone has enough first aid kit for the last few days in camp and journey home before everything is packed up. Make sure the campsite and the surrounding area are left clean and safe. The final days of the expedition can be dangerous times – people will be tired and with that end-of-term feeling rules are often broken. Be on your guard.