

Sanitation

Protecting Yourself

If doctors, hospitals and clinics are overwhelmed with flu victims medical attention may be unavailable for minor to moderate injuries and illnesses. Advice from doctors or nurses may be available via the telephone. It is important to know Basic First Aid, CPR and how to take a Blood Pressure. At some point in time you will become profoundly aware of just how vulnerable you are to this virus and you will want to take aggressive steps to protect yourself.

Although you might be able to stay at home for many weeks, and thereby avoid all contact with the general public, you will eventually have to venture into the world for something. When you do, you will want protection. From a practical perspective, there is really nothing that can provide a 100% guarantee that you will not get the flu while you are out in public, but there are a few reasonable steps you can take that will help you prepare for the most common means of flu transmission.

Before you even step out to get the mail, put on a pair of disposable gloves. You have probably heard this before, but the most common means of transmitting the flu from human to human (or a cold) is from hand to face. That is, from your own hand to your own face. So, if you do come into contact with something that is contaminated, and if you then touch your nose, your mouth, or your eyes, you can introduce that very contaminant directly into your body. You pick it up from "who-knows-where" and it goes right from your hand to your face and it makes you sick. That is why hand washing is so important.

In addition to hand washing, you need to wear disposable gloves before you come into contact with any object that has the remotest possibility of being contaminated. This includes such everyday things as doorknobs, gas pumps, mail, money, groceries, and other people—in fact, any object that you have not personally quarantined or sanitized.

Clean Water And Food

Disinfecting water by boiling (preferably for at least 10 minutes) or by treating it with chlorine or iodine. When water is first stored, it should be disinfected by the addition of 1 scant teaspoon of ordinary household bleach for each 10 gallons. To avoid contaminating water when removing small quantities from a container such as a waterproof bag, the simplest way is first to pour some into a pot or other medium-sized container, from which small amounts can be poured into individual cups. Dipping water with a cup runs more risk of contamination. The cleanest way to take small quantities of water out of a container is to siphon it with a flexible tube.

Sanitary storage of food in expedient shelters is often difficult. Although almost any paper or plastic covering will keep fallout particles from food, shelter dampness can cause paper containers to break. Ants, roaches, and weevils can cut through paper or plastic coverings to reach food inside. Placing paper containers of food in plastic bags and suspending the bags from the ceiling of the shelter entryway gives good protection against bugs, and quite good protection against moisture for a few weeks. (Do not obstruct the air flow through an entryway if heat is a problem.) A small amount of insect repellent or grease smeared on the suspending string or wire will stop all crawlers. Metal and strong plastic containers with tight lids protect food best. The hygienic preparation and serving of food in a shelter, especially in hot weather, require that all cooked food be eaten promptly. It is best to eat within half-an-hour after cooking. Canned foods should be consumed shortly after opening. The cleaning and disinfecting of utensils, bowls, etc., should be done promptly, to prevent bacteria from multiplying and to lessen the chances of ants and other insects being attracted into the shelter. Sugar should be mixed with cereals in the cooking pot, to avoid spilling. In Oak Ridge National Laboratory shelter tests, only a few infants and toddlers have been included among the occupants. Feeding infants and small children over a piece of plastic would be one good way to keep the inevitable spillage from complicating shelter life. To avoid using dishes, most foods can be served on squares of plastic. Spoons and such plastic "dishes" can be licked clean after eating, then disinfected by boiling or by dipping them into chlorine bleach solution containing one tablespoon of Clorox-type bleach to a quart of water. A shelter occupant without a spoon can eat very thick grain mush in a sanitary manner by placing it on a piece of plastic held in his hand, forming it into a ball, and taking bites. Although Chinese peasants often eat wet-rice balls held in their bare hands, experiments have indicated -not unexpectedly that Americans do not like to eat this way. Cooking without oil or fat makes disinfecting utensils much easier when water and fuel are being conserved. Cereals and sugar are easy to wash off with a little water, without soap.

Control Of Insects

Insect sprays used in high-protection-factor shelters are likely to cause more problems than they eliminate. Poisonous insecticides should be used with caution. Insect repellents on the skin and clothing are generally helpful, but not likely to be in sufficient supply to last for weeks or months. Some insect problems and simple means of controlling them are described below.

Mosquitoes would multiply rapidly, because normal control measures would not be in effect. Using insect screen or mosquito netting to cover the ventilation openings of a shelter is the best way to keep out mosquitoes, flies, and all larger insects. The lack of insect screening-when it would be too late to obtain any-could result in more harassment, discomfort and possible disease than most people accustomed to modern living are likely to imagine. However, if the shelter has no air pump, it is impractical to use screens that obstruct the free movement of vital air except in cold weather. If you have prudently kept a can of modern fly bait in your survival supplies, a little sprinkled on top of the plastic covering can kill literally thousands of flies. Shelter occupants should make every effort to prevent flies from reaching disease-spreading human wastes.

Ants, especially in the warmer parts of the country, could drive people out of expedient shelters. The best prevention is to try to find a shelter-building site that is not near an ant nest, if shelter occupants are careful in storing food and eating, ants are less likely to become a problem. Ticks and chiggers are usually found on grass and low bushes. To avoid carrying these pests into the shelter, do not bring grass or dead leaves into your shelter for bedding except in freezing weather. Cut leafy branches high above the ground: few pests live in tall vegetation.

Personal Possessions

Toothbrushes are not boiled or otherwise disinfected after being used, because we all develop considerable resistance to our own infective organisms. For the same reason, each individual should have his own personal drinking cup, bowl, and spoon. They should be cleaned as well as possible and kept covered when not in use.

Prevention Of Skin Diseases

In crowded shelters, especially during hot weather, skin diseases are likely to be a more serious problem than is generally recognized. The importance of learning how to prevent skin diseases was made apparent by one of the very few shelter- occupancy tests to be conducted in the summer without air conditioning. This was a Navy test in which 99 men lived for 12 days in an underground shelter cooled only with outdoor summer air.¹⁵ The incidence of skin complaints was high, even though medical treatment was available on a daily basis. The total number of reports to sick call was 560; 34 of these 99 healthy young men contracted heat rash and 23 had other skin complaints such as fungus infections. However, these sailors lived in an inadequately ventilated shelter and did not cleanse their sweaty skins or use the other methods listed below for preventing skin troubles. Even in shelters that are skillfully ventilated with adequate outdoor air, skin diseases will be a serious problem especially in hot weather unless special hygiene measures are followed. Humid heat and heat rash increase susceptibility to skin diseases. Most of the following measures for preventing skin diseases have been practiced by jungle natives for thousands of years.

- ▶ Wash off sweat and dead skin. (When it is hot and humid, dead skin is continuously rubbing and flaking off and starting to decay.) Many jungle natives rinse their bodies several times a day. Bathing several times a day with soap is harmful in humid heat: the rapid loss of normal skin oils is one of the causes of skin diseases. Your skin can be kept fairly clean by rinsing off each day with just a cup of water, while rubbing gently with a very small cloth. A 6-inch square of bed-sheet cloth serves well. So that you can dispose of the dirty water afterwards, wash yourself while standing on a piece of plastic with its edges held up slightly. (Place sticks or narrow boards under the edges.) Use about two-thirds of the precious water for the first rinse, starting from the face down and gently rubbing neck, armpits, stomach, groin, buttocks, and feet with a washcloth. Then use the remaining water to rinse off again, using bare fingers. If boiling water is available, sterilize washcloths every day by boiling them for a few minutes.
- ▶ Sleep as cool and bare as practical, to dry the maximum skin area.
- ▶ If practical, sit and sleep only where other members of your family do and avoid use of bedding by more than one family.
- ▶ Avoid infection from toilet seats by disinfecting with a strong chlorine solution and then rinsing, by covering with paper, or by not sitting down.

- ▶ Wash or disinfect clothing as often as practical, especially underwear and socks. Disinfecting clothing, not laundering it, is the most important health objective under difficult shelter conditions. Dipping clothing into boiling water disinfects it. Unless plenty of water is available for rinsing, do not disinfect clothing by putting it in a chlorine bleach solution. Wear shoes or sandals when walking about, to prevent fungus infections of the feet.

Vomiting

Vomiting is certain to cause both morale and health problems, especially for unprepared shelter occupants fearing this first dramatic symptom of radiation sickness. Nervousness, combined with the effects of unaccustomed food and water, will cause even some healthy persons to vomit. In a crowded shelter, the sight and smell of vomit will make others throw up. Plastic bags, well distributed throughout a shelter, are the best means to catch vomit and keep it off the floor. Buckets, pots, or a newspaper folded into a cone also will serve.

Disposal Of Dead Bodies

In large shelters which are occupied for many days, someone may die even when no occupants have been injured. The sight or the sickly-sweet stink of a decaying human body is greatly disturbing. Some civil defense workers have theorized that the best way to take care of a corpse in a shelter is to seal it in a large plastic bag. A simple test with a dead dog proved this idea impractical: gas pressure caused the bag to burst. One solution is to put the corpse outside as soon as the odor is evident. First, if possible, place it in a bag made of large plastic trash bags taped together and perforated with a few pinholes.

Respiratory Diseases

The spread of respiratory and other diseases transmitted by coughing and sneezing would be difficult to control in long-occupied shelters. Adequate ventilation would help in disease prevention. In small shelters, it would be better if persons who are sneezing or coughing could stay near the opening being used for air exhaust. In large shelters with many occupants, the risk of one or more of them having a disease that is easily spread obviously will be higher than in a small shelter.

Human Waste Disposal

To preserve health and morale in a shelter without a toilet or special chemicals for treatment of excrement and urine, human wastes should be removed before they produce much gas. A garbage can with a lid or a bucket covered with plastic will not hold the pressurized gas produced by rotting excrement. The following expedient means of disposal are listed in increasing order of effectiveness.

Use a 5-gallon paint can, a bucket, or a large waterproof wastebasket to collect both urine and excrement. Use and keep it near the air-exhaust end of the shelter. Keep it tightly covered when not in use: a piece of plastic tied over the top keeps out insects and reduces odors. When such waste containers are full or begin to stink badly while covered, put them outside the shelter still covered to keep out flies. For some people, especially the aged, bringing a toilet seat from home would be justified. Padding on the edge of the bucket also helps those who have to sit down. An improvised seat of plywood or board serves well. If only one container is available and is almost filled, periodically dump the wastes outside unless fallout is still being deposited.

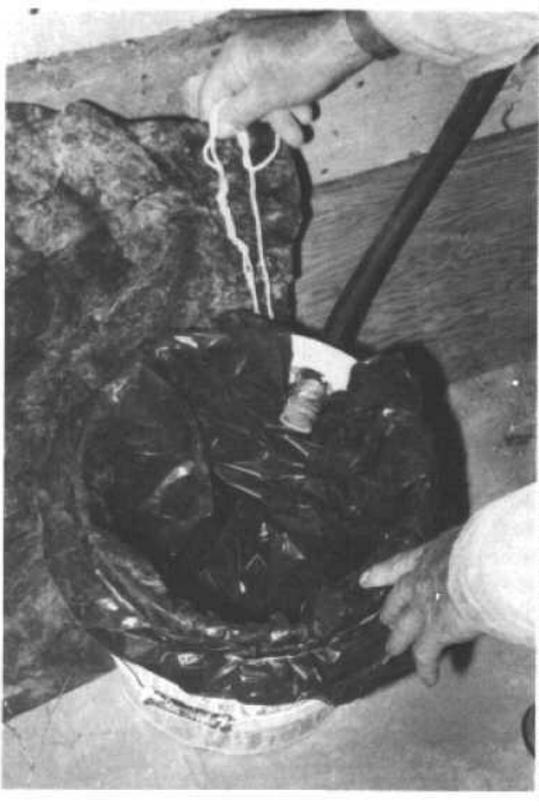
People who plan to stay in a shelter should dig a waste-disposal pit if they do not have sufficient waste containers for weeks of shelter occupancy. The pit should be located about 3 feet from the shelter in the down-wind direction. This usually will be the air exhaust end of an earth-covered shelter. The pit should be surrounded by a ring of mounded, packed earth about 6 inches high, to keep surface water from heavy rains from running into it. Quickly putting or dumping wastes outside is not hazardous once fallout is no longer being deposited.

Have all occupants only urinate in the bucket, and defecate into a piece of plastic. Urine contains few harmful organisms and can be safely dumped outside. Two thicknesses of the thin plastic used to cover freshly dry-cleaned clothes will serve to hold bowel movements of several persons. Gather the plastic around the excrement to form a bag-like container. Tie the plastic closed near its upper edges with a string or narrow strip of cloth. Do not tie it so tightly as to be gas-tight. Each day's collection should be gently tossed outside. As the excrement rots, the gas will leak out of the tied end of the plastic covering. Flies will be attracted in swarms, but they will not be

able to get into the plastic to contaminate their feet or to lay eggs. And because rotting excrement is so attractive to flies, shelter occupants will be bothered less by these dangerous pests.

If you have prudently kept a can of modern fly bait in your survival supplies, a little sprinkled on top of the plastic covering can kill literally thousands of flies. The most effective fly baits, such as Die Fly and Improved Golden Malrin, are sold in farm supply stores. Use a hose-vented, 5-gallon can or bucket lined with a heavy plastic bag: cover tightly with plastic when not in use. Figure 12.1 shows this type of expedient toilet. The vent-hose runs through a hole near the top of the paint can shown and is taped to seal it to the can. Such a hole can be quite easily cut with a chisel or a sharpened screwdriver. The hose is long enough to extend outside the shelter. Its outer end should be secured about 6 inches above ground level, to prevent water from running into it during a heavy rain. When a toilet-can is tightly covered, foul gases can escape through the hose to the outdoors. With its opening tied shut, a large plastic trash bag containing as much as 30 pounds of wastes can be lifted out of a toilet-can and disposed of outside the shelter.

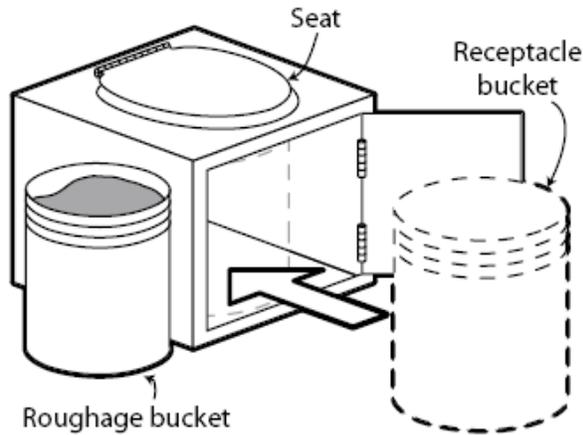
Fig. 12.1. A 5-gallon paint can used for a hose-vented toilet can, with a plastic trash bag for its removable liner.



Sawdust Toilet

The sawdust toilet is a convenient method of composting your humanure while still having a toilet inside your home. This method consists of two parts, a toilet receptacle inside, which is filled with sawdust or other roughage, and regularly emptied into a set of composting bins outside. The toilet receptacle inside is simple to construct, and can be made in a variety of different ways. Using 5-gallon buckets as the receptacle is easy, since they are so common. Do not use a larger size than that, since the contents would be very heavy to carry out to the pile. You can build a toilet seat on top of it, or a platform to squat on. After each “deposit”, add roughage to cover the feces and urine. This toilet does not require an airtight or fly-proof lid, since the roughage keeps out flies and cuts smells. When the receptacle is full (or almost too heavy to carry) it can be dumped in the compost bin and buried in the top layer of the compost pile.

Composting toilet receptacle



Pit Latrines

The simplest type of latrine is a pit, with some covering. In a wilderness setting, with few people, feces can simply be buried shallowly in the soil, at least 100 feet from water. In a setting with a denser population, a larger pit is required. Sizing the pit is important. The amount of poop that each person produces per day varies widely based on diet and other variables. A good general estimate is to assume that one person will give 1.4 cubic feet of solids per year. (The water content is less important, since it will drain out or evaporate). So for 25 people, you will need a pit volume of at least 35 cubic feet per year of use. Leave an additional 25 inches of depth from the surface in calculating the pit volume. You will need this space to put dirt back into, so make sure to set the dirt aside in a pile to put back in later.

Build a basic structure of some sort on top of the pit with the materials that you have available. One suggestion is shown in the illustration on the following page. It is important to have a close-fitting cover for the pit to reduce odors and keep out flies. Elevated seats are common in the culture I'm from. However, many people find it more comfortable to poop from a squatting position. There is some evidence that this is healthier for you, and it is certainly easier to make a simple hole in a board. However, this may be less appropriate for people who have difficulty standing up from a squatting position. If small children are afraid of falling into the hole, you can make a "hole cover" with a smaller hole in it, or simply make a second, appropriately sized hole in the floor.

If the water table is too high, or the soil too shallow or tough to dig in, you can dig the pit in an elevated earth mound and/or use a barrel with a perforated or removed bottom and elevate the structure above it. Depending on your soil type, and the shape and depth of the pit, you may need to line it with rocks or old drums (tops and bottoms cut off) to prevent it from collapsing. However, the lining should be porous at the bottom to allow liquids to leave the pit. After use, when there is only 25 inches left between the surface and contents of the pit, move the structure on top to a new site, and fill the full pit in with the dirt. If smells are a problem, users can put earth, wood ashes, sawdust or lime into the pit after each use. Wood ash (hardwood ash especially) is effective at limiting smell and fly problems.

Ventilated Improved Pit Latrines

The VIP latrine is an enhancement of the basic pit latrine that addresses smell and fly problems. A ventilation pipe is added (as shown) which extends at least 20 inches above the top of the shelter roof. As air moves across the top of the pipe, it draws air up out of the shelter and pit. A mosquito net on top of the pipe traps flies inside, where they die. The interior of the shelter should be relatively dim, so that flies are attracted to the light from the pipe. This latrine does not include a lid for the hole, since air is constantly drawn through, keeping smells to a minimum, but you may need to use one anyway in less windy areas.

