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12.0 Travel, Safety and Security

Introduction

The risks and hazards of travel generally depend on your destination, how informed and prepared you are before departure, your state of health, and your perceived level of importance to those who might wish to cause harm. Therefore it is important to learn as much as possible about the destination so that you can cope well, not offend local traditions, and avoid health and safety issues. For some locations it may be advisable for exploration companies to carry out a risk assessment to determine whether doing business there presents unacceptable risks to the company or its employees. When visiting a field project you may be going places where typical tourists do not travel. Use appropriate guidebooks to learn about the country and research the risks on government websites, such as those of Canada, Australia, the UK, and the USA if you want information in English. Talk to other mineral exploration people who may have worked there, though their advice may not be perfect – sometimes people working in a risky area become accustomed to the risks and downplay them. Check with a travel medical advisor who is familiar with health issues in the region. Finally, always keep a low profile to avoid the appearance of a good target and “someone of value”.

An exploration company initiating a program in a country with perceived risks may benefit from professional expert advice, especially if serious security problems exist. There are security firms that specialize in assisting companies with the issue of travel outside the home country. Such companies will run training courses on safe, secure travel, audit company procedures, assist with setting up emergency response systems, provide personal security on site, and may establish “safe house” accommodations in extreme situations. Some may also assist with crisis situations such as negotiations in the event of kidnapping.

12.1 Risks and Hazards

Lack of preparation and knowledge about potential travel-related risks can have serious consequences. Risks include:

- Impact on health caused by:
 - Disorders such as jet lag, barotrauma, blood clots in legs
 - Diseases caused by contaminated food, contaminated water, contaminated air, plus insect-borne, animal-borne, soil-borne and parasitic diseases
 - Lack of acclimatization before starting work at high altitude illness, in hot climates
 - Inadequate immunization, which may consequently require receiving injections with potentially unsanitary needles in developing countries
 - Inadequate preparation for unfamiliar temperature and weather related risks, including hypothermia and hyperthermia
- Injuries or death caused by:
 - Transportation related crashes – aircraft, vehicles, trains, boats, motorbikes
 - Lack of training to carry out field work in unfamiliar terrain
 - Lack of an escape plan from a hotel fire
 - Kidnapping, carjacking

- Terrorist activities
- Assault, robbery and/or loss of possessions caused by:
 - Lack of proper business contacts or a knowledgeable guide
 - Unsecure hotel room
 - Street crime, muggings, kidnapping civil unrest
- Kidnapping caused by carjacking, lack of a knowledgeable guide, terrorism
- Adverse impact on company business and reputation caused by:
 - Lack of familiarity with cultural differences, unfamiliar laws and regulations
 - Corruption

12.2 Responsibilities (Due Diligence) and Travel Safety

Exploration companies and their employees have certain due diligence obligations regarding travel safety.

Exploration companies

- Make certain the health and safety of each employee is protected when they travel.
- Consider providing special training for employees who will enter or work in areas or countries with significant travel risks and unfamiliar terrain.
- Develop safe operating procedures (SOPs) to address the risks and hazards related to travel safety and security. These are SOPs that should be in place in addition to those for field work and normal field travel, which are covered in the following chapters:
 - 6 Safe Traversing Practices
 - Transportation: 13 Vehicles, 14 All-Terrain Vehicles, 15 Snowmobiles, 16 Aircraft and 17 Boats, Canoes and Inflatables
- Make sure that emergency response plans (ERPs) are in place that cover the destinations of travelling employees. Include a company or an agency telephone number that is easily called – collect – from any country that immediately creates contact between the employee and a suitable designated senior company person in the home country. Test the telephone number to be sure it works. Refer to Chapter 3 Emergency Response and section 19.6.2 Company Hotlines, located in chapter 19.
- Develop a process to make sure employees have checked for up-to-date information regarding health risks at the destination, which should include diseases such as hepatitis, malaria, Chagas disease and yellow fever. Inoculations need to be up-to-date, especially for tetanus and those required for overseas work.
- Develop a process to make sure employees have received up-to-date information regarding security issues in the country of destination.
- Provide for safe means of transportation within countries where risks are high. *Motor vehicle accidents are the leading cause of death and injury in developing countries.* It may be necessary to provide knowledgeable drivers, safe vehicles equipped with seat belts and other safety features, or pilots for boats. Companies should enforce the use of seat belts.

Employees

- Make sure your travel documents are valid. Do not misrepresent your status in a country – do not enter a country as a tourist when you are on business – it may create security problems for you.
- Make sure your inoculations are up-to-date, especially for overseas work. Check for up-to-date information regarding health risks at the destination(s). Allow sufficient time before departure to obtain and start medication sequences (e.g., malaria).
- Be informed and check for up-to-date information regarding security issues at the destination.
- Follow company SOPs regarding travel safety and security. Be aware of the ERP provisions for emergencies and evacuations and know how to get help should you require it. Know your company or agency emergency phone number as well as the contact information and location of your country's embassy or consulate or a "friendly" embassy or consulate.
- Wear a seat belt when travelling in any vehicle, including taxis.

12.3 International Travel Preparations

12.3.1 Preparation Checklist

Be fully prepared before departure. The following is an information checklist to consider, especially when visiting a country for the first time. Note that the information has to be considered relative to the passport that you travel with.

- Before travelling to a new location, access government websites, for example those of Canada, Australia or the USA among others, for information regarding the country of destination. Especially check the website of the government of the country of which you are a citizen. The specific government website should help you note the entry requirements and review any travel alerts and background notes in and around the destination country relative to the passport you travel with. By reviewing information on these and additional websites, one may be able to reach a balanced decision regarding security precautions. Be aware that some countries have more experience in certain areas than others. For example, the Australian government has a presence in Laos whereas the Canadian government does not (as of 2009). For this reason it can be expected that Australian assessments of risks in Laos are likely more reliable. Sources include:
 - Canada – Foreign Affairs and International Trade Canada: <http://www.voyage.gc.ca/index-eng.asp>
 - Canada – Travel Reports and Warnings: http://www.voyage.gc.ca/countries_pays/menu-eng.asp
 - USA – International Travel Information: http://travel.state.gov/travel/cis_pa_tw/cis_pa_tw_1168.html
 - USA – Department of State, Background Notes: <http://www.state.gov/r/pa/ei/bgn/>
 - USA – Overseas Security Advisory Council: <https://www.osac.gov/>
- Make sure you have a valid passport that will not expire until well beyond your anticipated return date. Some countries require a passport to be valid for six months beyond the

- return date on the ticket. Obtain any necessary visas, documents or references. Obtain the correct type of visa, as some countries require separate visas if you visit as a tourist or on business. Leave a copy of your itinerary and travel documents with your office and family and carry a copy in addition to your passport. Carry several spare passport photos in case an additional visa is needed. For example, a plane may make an unscheduled landing en route in a third country that requires a visa. In addition, be cognizant of the implications of travel between two foreign countries and that the legal implications (e.g., visa requirements or immunization requirements) may be different than when travelling directly from your home country.
- Be familiar with any company prohibitions or restrictions on travel to certain countries for security or health reasons. Many companies have insurance to cover certain types of risks (e.g., kidnapping), which may be invalid in some locations. Check that your private life and medical insurances will remain valid at your destination. Arrange for emergency evacuation insurance, as necessary.
 - Make sure your immunizations are up-to-date. Allow enough time to receive new immunizations and/or a consultation regarding anti-malarial medications, if necessary. Immunizations may be required for medical reasons or legal reasons; understand the difference. If you are travelling to more than one country, be aware of the implications of travel between specific countries, irrespective of your home country. For example, Brazil may require a yellow fever inoculation for a traveller from Peru even if it is a Canadian passing through Peru, although a Canadian travelling directly from Canada may not require this. The following website lists immunizations recommended for Canadians travelling outside Canada: <http://www.phac-aspc.gc.ca/tmp-pmv/236-eng.php>.
 - Travel medicine clinics provide immunizations and up-to-date information regarding travel health and disease issues throughout the world. Clinics are located throughout Canada and can be located on the following website: <http://www.phac-aspc.gc.ca/tmp-pmv/travel/clinic-eng.php>
 - Have a thorough physical examination and complete any necessary dental work if you are going to a very remote area. If it becomes necessary to receive medical or dental attention abroad, try to obtain recommendations for reliable doctors and/or dentists. The Canadian consulate can provide a list of names. A good source for overseas medical contact information is the International Association for Medical Assistance to Travellers (IAMAT): <http://www.iamat.org/>.
 - Bring more than sufficient prescription and over-the-counter medications for the duration of the trip plus a possible delay. Carry them in the original packaging and do not pack them all in your checked luggage. It may be advisable to carry a duplicate prescription with the identification of the doctor, dispensing pharmacy, and the dosage and drug identification numbers of the medications. Carry duplicate prescriptions for eye glasses or contact lenses. Diabetics etc., who carry syringes, should take a medical certificate to verify their requirement for medical use. Arrange for any necessary refrigeration of medication.
 - Register with your government embassy or consulate abroad. Registration with the Canadian government abroad can be done online on the following website: https://www.voyage2.gc.ca/Registration_inscription/Register_Inscrire/Login_ouvrir-une-session-eng.aspx?fwd=true&hash=V47WAYN5vsVenh0EvKU3fSg6161
Register with the US embassy or consulate abroad on the following website: http://travel.state.gov/travel/tips/registration/registration_1186.html
 - Know the location of and carry contact information for appropriate government offices in the destination country (e.g., the embassy of your citizenship). If the destination country is a risky location, it is probably worthwhile registering with the foreign affairs office or consulate for the country of your citizenship.

- Verify that your credit card will be accepted at your destination(s). It is advisable to arrive in a country with some local currency. Take some US dollars or other recommended currency in small denominations, as they are useful in most places especially for tips. In the event of a medical emergency it is imperative to be able to access sufficient cash or have an accepted credit card. Medical fees usually must be prepaid in advance or doctors will refuse to provide service. Do not rely on international health cards.
- Have a travel agent book a hotel in a safe location with a guaranteed reservation. Try to arrive during daylight hours.
- Arrange to be met when you arrive outside immigration by a business contact or representative. Alternatively, one can use a prearranged car and driver from a reliable agency for travel from the airport to the hotel. This can often be arranged through the hotel.
- If travelling to an area where sanitation standards are questionable, plan to take extra care with personal hygiene and be very careful what you eat and drink. Take hand sanitizer in containers small enough to pass through airline security. A small portable water purifier can be useful.
- Obtain an international drivers permit if you anticipate that you must drive a vehicle. This is not always advisable and hiring a local driver is usually a better plan.
- Obtain a good travel guidebook for the area. The trip will be more interesting and fewer risks may be encountered if you are knowledgeable about the destination. *Lonely Planet* and *Rough Guide* are two examples of guidebooks that contain information appropriate for people who travel in remote or back country areas. Backpacker-type of travel is often more similar to what exploration personnel experience than what normal tourists encounter.

12.3.2 Aircraft Travel Considerations

Commercial Air Travel

Companies should try to eliminate travel using airline companies with a questionable safety record. Bear in mind the following facts when choosing an airline:

- Most commercial jet aircraft are very safe and have similar safety performance records.
- Commercial airlines are generally safer than smaller commuter airlines, which are safer than charter airlines, which are safer than helicopters.
- It is advisable to avoid older generation jet aircraft such as DC 8s, Boeing 707s and Eastern Bloc aircraft, which are often used in developing countries. There may be problems as a result of age and/or poor maintenance.

Charter aircraft: If it is not possible to travel with a commercial airline and charter aircraft must be used, insist on a detailed safety briefing before take off and try to use only reputable charter companies. Do a visual inspection before boarding as described below. Refer to chapter 16, section 16.3 Aircraft Charters, for tips regarding charter aircraft.

When travelling by air in developing countries:

- Try to obtain information from knowledgeable locals and compare notes with other exploration companies regarding safety records of local airlines and aircraft charter companies.

- Get into the habit of observing the aircraft, ground activities and airline personnel before boarding the aircraft. Look for oil leaks, bald tires, dirty airframes and crazed or cracked windows.
- Do not be afraid to refuse to fly if you feel the risk is too great.
- Note: A mineral exploration company should carry insurance to cover employees when in the field. Such insurance will have conditions attached. For example, it may stipulate that all aircraft charters must involve aircraft (fixed wing or helicopter) with an airworthiness certificate. Usually military aircraft will not have an airworthiness certificate and thus it is possible that travel or air accident insurance is invalid in the case of an accident in a military aircraft. Mineral exploration personnel often charter military aircraft in less developed countries because no commercial aircraft are available.

12.4 Personal and Travel Security

In all countries, use common sense when choosing travel routes, methods of transportation and lodging. You may encounter situations over which you have little control. Be aware of the risks and be alert to potential threats, particularly when leaving your flight, taking taxis, and entering or leaving hotels. Use local knowledge whenever possible for advice on how to reduce personal risk (business contacts, hotel concierge, local office personnel, local embassy). However, be wary when people belittle risks because they may have become too accustomed to them.

- Arrange to be met by a company representative just outside immigration upon arrival, or prearrange a taxi with your hotel the first few times you visit a new country. This will avoid having to negotiate transportation. People new to a country will be unfamiliar with the local routines regarding transportation, which can place them in a vulnerable position.
- When carrying out property examinations or reconnaissance work, always be accompanied by a reliable, knowledgeable guide who is fluent in the local language, the culture, and potential risks from wildlife and/or diseases. Use approved or recommended means of transportation.

Safety and security tips

- **Driving:** In some countries, foreigners are automatically implicated in any crash when they are the driver. Therefore, it is advisable to hire a professional driver. Reliable drivers may be associated with better hotels. In some countries it is unsafe to drive at night – either in the city or in the countryside. Vehicle crashes are the number one cause of injury to travellers. Wear a seat belt and request a vehicle that is equipped with them if they are not installed.
- **Taxis:** If the streets are not safe to walk at night, use dependable licensed taxis.
 - If it is confusing to determine legitimate taxis, inquire at the airport or hotel information kiosk for ways to identify safe taxis.
 - Try to hire taxis associated with hotels (or hotel courtesy vehicles) and avoid public transportation and hailing taxis on the street. Whenever possible, select taxis equipped with seat belts.
 - Avoid poorly maintained vehicles and look over the driver carefully. Do not enter a taxi with two people in it (driver and “assistant”). If you are unsure about the taxi, step back and wait for another.
 - Pay for the taxi before you get out.

- Carry change – taxi drivers will often claim to have no change.
- **When working alone or on an assignment**, even in an urban area, it may be advisable to have a check-in routine once a day with a person at the office who is responsible for tallying contacts each day. This can be done by email.
- **Make sure your accommodation is secure.** In countries of moderate to high risk, luxury hotels may provide better security.
- **To minimize and avoid robbery:**
 - Carry cash separately from credit cards. Keep your valuables in several locations (money belt, several wallets). Where pickpockets pose a high risk, it may be wise to keep a “dummy” wallet containing limited cash in a visible pocket and another wallet safe in another place. Consider keeping an expired credit card, old cash receipts and a small amount of US dollars to make the dummy wallet appear normal.
 - Be very careful when exchanging currency to prevent being cheated or robbed. If exchanging large sums of money, you may be observed and marked for robbery.
 - Remember that muggers and bandits are generally only interested in your money. If you are confronted, hand over your money on demand with one hand and keep the other hand in the air. If you have two credit cards (personal and company cards) keep them in different places. If you are held up, initially produce only one card. In some cases, exploration personnel have negotiated back their credit cards from robbers, but this can be risky.
 - Do not forget your PIN. An aggressive robber may not believe it when you tell him/her that you have forgotten it and may assault you.
 - Keep a list of contact numbers for credit card distributors so that you can neutralize the cards as soon as possible if they are stolen. Never leave credit receipts lying around your hotel room and do not throw them in the garbage.
 - When wearing a money belt, loop it around a belt loop so that if it is cut, it does not fall to the ground.
 - Leave nonessential money, valuables and documents in the hotel safe. Take with you only what you need. In some countries you must have your passport and visa with you at all times.
 - Carry a small amount of money available for tipping so it is not necessary to expose your wallet to view.
- Do not announce your travel or business plans in a public place, hotel lobby, airport etc. Luggage should not reveal your business connection.
- Try to use inconspicuous (but reliable) vehicles and park as close to your destination as possible. Often, a hired driver is the best solution.
- Protect your computer and valuable files with passwords. Do not leave your computer or external hard drives unattended in your hotel room. Lock them in a hotel safe with other valuables if possible.
- Know where your bag with valuables, documents and computer is at all times. Be especially careful in public locations such as airports, as it can be stolen very quickly.
- Always notify others of changes to your schedule and itinerary; maintain a record of local emergency contact numbers.

- When departing at airports, it is safest to check in and immediately proceed through the control gates to the restricted waiting area.
- Carefully follow airport security requirements when packing your carry-on bags. Keep informed about changing regulations.

Business people may be at some risk for kidnapping or robbery in some countries.

- It is important to maintain a low profile.
 - Dress discreetly and do not wear clothing with a business logo. Do not wear valuable jewelry; wear an inexpensive watch.
 - Do not draw attention to yourself with loud or confrontational behaviour.
 - Consider carrying your computer in a less conspicuous bag than the usual computer shoulder bag. Consider carrying an inexpensive camera.
- Be aware that you are most vulnerable to kidnapping when leaving your flight, catching taxis and entering and leaving your hotel, as well as while travelling in a vehicle.
- Avoid routine. Wherever possible, vary your travel routes and times between the hotel and office. Be wary of accidents or incidents, especially those that appear to be contrived.
- When you are walking, note possible refuges that you can use if you get into trouble. Stay close to busy thoroughfares. Avoid unlit streets or late night activities. Watch for threatening situations and refuse unsolicited offers of lifts.
- See section 12.7 Kidnap and Ransom below for additional information.

Additional tips to reduce personal risk

- Do not travel to a high risk destination unless it is absolutely necessary. If you do proceed, be familiar with company crisis and contingency plans that are in place there.
- Be alert. Pay attention to what is happening ahead of and behind you when walking or riding; use the rear view and side mirrors to monitor traffic for vehicles that may be following you.
- For women: In most countries, local women never respond to strangers. You will be safest if you respond to men who approach you with cold silence and indifference. In some places even the word “no” may be interpreted as a “yes” and the beginning of a conversation.
- Show respect for local customs and cultures and be aware of any current cultural or political events that might result in civil disorder. If you encounter a disturbance, leave the area immediately and do not become involved.
- If there is any possibility of civil disorder within the country, register or confirm your registration with your embassy (or with several “friendly” embassies should yours not be available) so you will be included in any necessary evacuation.

12.5 Hotel Safety

Although fire, theft or assault can occur in any hotel or motel around the world, a travel agent should be able to recommend a hotel in a safe area. Make a guaranteed reservation so you will

not be stranded if they overbook. Use common sense and follow a few routines whenever you check in or approach your hotel room. This may prevent disaster – especially if there is a fire.

When choosing a hotel room consider the following:

- Request a room with a peep hole, a deadbolt and a chain lock.
- Avoid a ground floor room and keep windows and doors secure.
- Choose a room located on the side of the building with a street that can accommodate fire rescue equipment. Fire rescue equipment rarely reaches higher than 25 metres (6 to 8 stories).
- Inquire if there are working smoke alarms and a sprinkler system in the rooms.

To prevent theft:

- Never leave clothing or luggage unattended anywhere – especially in hotel lobbies, restaurants, and airports.
- Be careful about being distracted by someone talking to you while an accomplice takes your briefcase or other belongings.
- Request a room near an elevator if theft is a problem where you are staying. These rooms are safer because thieves usually target rooms near the end of corridors and near stairwells.
- Never leave valuables, papers, travel documents, computer or cash lying in your room; use a hotel safe. Do not think that hiding something in your room is sufficient.
- Check that all locks on hotel doors and windows work properly, including those on sliding doors that open onto a balcony. Request another room if any lock does not work properly. Check that all windows and doors are locked each time you return to the room (i.e., sliding glass and those to adjoining rooms).
- Keep all the doors and windows locked at all times, even when you leave the room briefly. Keep the door chain-locked until you visually identify visitors.
- Leave the “Do Not Disturb” sign on the hotel door at night and also when you are out in the evening to give the impression that you are in the room.
- Do not leave the sign on the door requesting that the room be made up; this advertises the fact that you are not present.
- Become familiar with regular hotel staff and stay clear of staff you are unsure of.
- If someone knocks claiming to be from hotel services, call the desk to verify this fact if you have not requested the service.
- Do not enter your hotel room if anyone is lingering nearby or follows you in the corridor. Pass by your room and find a hotel telephone to request security or return to the front desk. It is common practice for thieves to push a victim into a room as the door is being unlocked.
- Alarms: A burglar alarm can be improvised by stacking small objects such as drinking glasses and ashtrays in front of the door so the noise from them being knocked over awakens you. The standard rubber wedge door stopper will work to block the door. There are also inexpensive wireless electronic door and window alarms that sound when they are disturbed. These are readily available at many local hardware stores, security products stores, and through the internet.

12.6 Hotel Fire Safety

During a hotel fire, people die more frequently from smoke inhalation, toxic gases or injury due to panic than from flames. If fire breaks out – **DO NOT USE THE ELEVATOR** – as it may take you to the floor where the fire is burning. Remain calm and **DO NOT PANIC**.

Plan your escape procedure from fire when you check in.

- Ask how guests are notified in the event of fire.
- Find two evacuation routes from your hotel room immediately after you enter and set down your luggage. Refer to a hotel evacuation map, which may be posted on the back of the door or in a hotel brochure. Locate the fire alarms, fire extinguishers and the fire exits on either side of the room.
- Count the doors to each fire exit so you can feel the way to the exit, even if the hall fills with smoke. Check that the exits are not blocked or locked. Note any obstacles such as furniture in the corridor or if it is necessary to turn a corner to reach the exit.
- Note whether it is possible to escape from the hotel window. There may be a roof or deck that you can safely drop onto below the window.
- Check that the window will open. If not, consider the best way to break it should the need arise.
- Test that the smoke alarm operates by pushing the button. If not, request another room if the hotel staff will not immediately repair or replace it.
- Note how to stop the air circulation fan that supplies air to the room.
- Always keep your room key, eyeglasses, identification papers and a flashlight on the bedside table so you can locate them in the dark. The flashlight should have a strong beam.
- In some places it may be advisable to carry a smoke hood (evacuation hood). The smoke hood may provide additional time and safe air to breathe to escape a hotel fire (or aircraft fire). An evacuation or smoke hood should meet certain requirements (which are not standardized) that include protection against carbon monoxide. Some hoods require knowledge or practice to put them on correctly. To purchase an evacuation or smoke hood, search the internet for “evacuation hood” and “smoke hood” and pay attention to the safety criteria and protection time they offer. The following website has information about good evaluation criteria for smoke hoods:
http://fseg.gre.ac.uk/fire/fire_safety_tips.html#smoke_hoods

If a fire breaks out in your room, do the following:

- Telephone the hotel operator and inform them of the fire and your location.
- Try to put out the fire only if it is small and you are sure that you can do so.
- If you cannot control the fire, leave the room and close the door securely to confine the fire. Take your key, glasses, identification papers and flashlight. Activate the alarm and notify your neighbors. Use the stairs to exit the building.

If a fire breaks out elsewhere in the hotel, do the following:

- Take your key, eyeglasses, identification, smoke hood and flashlight and go to the door. Crawl to the door if there is smoke in your room. Smoke rises; the clearest air will be near the floor.
- Before opening the door, feel the surface and doorknob to determine if it is hot. Do not open the door if it is hot.
- If the door feels cool, open it slightly to see if there is smoke in the corridor. Close the door quickly if the corridor is filled with smoke.
- If it is safe to leave your room, take the essential articles (above) especially your key and flashlight in case you must retreat to your room. Always close your hotel room door.
- If the corridor is passable, walk or crawl to the fire exit stairwell, counting the doors if necessary. Test to determine if the fire exit door is hot before opening it. If it is safe to enter, walk down the stairway holding securely onto the handrail to avoid falling. Close the fire door to the stairwell. Do not enter a stairwell that contains smoke. Try the alternate fire exit(s). Retreat to your room if you cannot find a smoke free stairwell for escape.
- Stop if you encounter smoke as you descend the fire exit stairwell. Reverse your direction and retreat to your room (or a smoke free corridor where you should bang on doors to find a smoke free room). Hang on tightly to the stair rail, as people will be attempting to go down. Smoke rises in stairwells so do not go to the roof. Chances are, these doors will be locked and you will be unable to exit onto the roof. Go to the roof only as a last alternative.
- Use your smoke hood when you encounter smoke. Wearing one may allow you to use an escape route that contains some smoke.

If you are forced to remain in your room, do the following:

- Try to notify the hotel operator that you are remaining there. Hang a sheet in the window to signify your presence.
- Fill the bathtub with water and turn on the fan to help disperse any smoke – but make sure no smoke enters. Soak towels and sheets and place them around the door, windows and vents – wherever smoke may enter. Use an ice bucket or waste paper basket to wet down the door and any walls that feel hot. Soak the mattress and place it against the hot door. Swing a wet towel around in the room to help clear the air of smoke. Remain calm.
- Open a window slightly to gain fresh air only if necessary. Before you open or break the window, make sure no rising smoke or flames can enter the room from the outside. If necessary, drape a blanket over your head to make a tent while you breathe at the opened window. This will help exclude smoky air in the room from your lungs. A wet towel held over your nose and mouth will help filter out smoke.
- If it becomes impossible to remain in your room, choose the best exit. Cover yourself with a wet blanket and use wet towels to cover your mouth and nose. Stay low to the floor to avoid smoke and toxic gases. Put on a smoke hood if you have one.
- Do not drop from your room if you are more than two floors above the ground. If it is safe to do so, try to lower yourself using a securely tied sheet etc., rather than jumping from the window sill. People are almost always badly injured or killed if they jump from more than one story.
- STAY CALM. Panic causes most hotel fire deaths.

Know how to use a fire extinguisher to help escape from a building.

Should you find yourself and others trapped by a fire that is shooting flames from a room out into a corridor with the exit beyond the flames, the following action will help you escape.

1. Using a dry chemical extinguisher (B or ABC), make two discharges into the flames using a sweeping circular motion. The dry chemical compound will disrupt the flames for a short time so that people may run along the corridor past the fire to the exit on the other side.
2. Repeat the circular motion discharges until everyone has escaped out the exit.

12.7 Kidnap and Ransom

As a foreign traveler, you may be targeted for kidnapping and ransom. Those who perpetrate these crimes are either promoting a political agenda and/or seeking to gain a financial or political dividend. Travelers are advised to check if there is a history or risk of kidnappings where they intend to travel and take the necessary precautions to mitigate these risks. In the USA and sometimes Canada, the crime is often motivated by sexual predation and/or murder, whereas in most other countries the aim of kidnappers is usually limited to extortion and a ransom payment – it is simply a “business deal”.

If you are a victim of kidnapping or carjacking, the appropriate reaction depends on the country where the crime occurs.

- In most cases, you should give up your possessions quickly and try to do whatever you can to avoid being taken away from the abduction location as your chances of survival are limited.
- In general, for most other countries the best response is to remain calm and maintain your dignity. Cooperate with your captors. Do not try to mislead them, but do not provide unsolicited information. This response is appropriate for most countries.

Because abduction situations vary greatly, the following considerations should be applied based on one’s best judgment at the time:

- Know the ransom policy of your government. Will they negotiate?
- The greatest risk of physical harm exists at the point of capture and during a rescue attempt or upon release.
- Remain calm and alert. Exert control on your emotions and behaviour.
- Be passively cooperative, but maintain your dignity.
- Assume an inconspicuous posture and avoid direct eye contact with captors.
- Avoid resistance, belligerence or threatening movements.
- Make reasonable, low key requests for personal comforts (bathroom break, a blanket, exercise, books to read etc.).
- If questioned, keep answers short. Volunteer nothing.
- As a captive situation draws out, try to establish some rapport with your captors.
- Avoid discussing contentious issues (politics, religion, ethnicity).
- Establish a daily regimen to maintain yourself physically and mentally.

- Eat what your captors provide and try to consume healthy balanced portions of food and drink but avoid overeating. Avoid alcohol.
- Keep a positive, hopeful attitude.
- Attempt an escape only after weighing the risks and when you are certain to succeed.

12.7.1 Express Kidnapping

“Express kidnappings” – also referred to as ATM abductions, where the victim is forced to withdraw money from his or her bank account or credit card – are common in many urban areas. The crime is well established in some countries and is increasing in Latin America. The criminals work in teams and often patrol a major thoroughfare in several vehicles and communicate with each other via handheld radios or cell phones. When a victim is identified, they will follow him or her until the victim exits onto a side street in some quiet suburb or turns into some unattended parking lot.

When the attack is initiated, two or three vehicles will block the victim’s car and team members swiftly gain access to the victim’s vehicle, hijack the car and kidnap the victim all within a matter of seconds. It happens with positive and aggressive action and so quickly that the unfortunate person is in shock and the criminals are in control before he or she realizes what is happening. Invariably they rob the victim of possessions, take them to an ATM (automated teller machine) to make withdrawals using credit or debit cards, and in some cases they proceed to the victim’s place of residence and steal personal belongings, such as jewellery, money and electronic equipment.

Victims should be aware that they may be held for a number of hours, often moving from one day into the next. This enables the robbers to take out the maximum daily withdrawal from the account on two consecutive days. Victims are not usually held for more than 24-48 hours and they are usually left a good distance from the kidnapping site. These events generally occur in the evening, although they do occur during daylight hours. The types of targeted vehicles vary from country to country.

- Express kidnappings are frequently conducted by ruthless individuals who are likely to resort to violence if confronted with resistance. Do not give them an excuse to become violent.
- Readily provide your personal account password. If you pretend to have forgotten it, they will typically use violence to force you to remember it.
- Remember – the primary objective of the kidnapper is to get your money. If you comply, you assist them in getting what they want, thus minimizing the potential for further violence.
- Your primary concern is survival; do not worry about your money. Remember – your life is worth much more than the money in your account.

Prevention and preparation

You can help avoid becoming a victim of express kidnapping by practicing and implementing good preventative measures.

- Do some research before a trip and seek local knowledge to find out if this crime is common. If so, learn where the risks are highest and which areas to avoid. Some information is available on the following website: <https://www.osac.gov>
- Avoid renting or riding in the frequently targeted types of vehicles.

- Avoid driving alone; a single occupant car is a more vulnerable target than a car with several people in it.
- Keep the vehicle doors locked and windows rolled up at all times.
- Familiarize yourself with your route to avoid referring to a map and appearing lost or vulnerable. Use well traveled streets. Avoid short cuts and unfamiliar side streets.
- Be alert to what is happening ahead and behind as you drive. Continuously use the rear view and side mirrors to monitor traffic at least one block behind.
- Use good counter-surveillance techniques to be aware of your surroundings. Some examples include:
 - If you suspect you are being followed and this technique is possible, make three right turns and see if the vehicle is still in sight.
 - Pull over and park in a populated area so that you can try to identify the persons following you. This also disrupts their surveillance process.
- If you suspect you are being followed, radio or telephone for assistance and drive to a safe place or a populated area and seek help.

12.8 Travel Health

It is not unusual for employees to become ill when travelling abroad. The most common ailments are related to consuming contaminated food and/or water that result in “traveller’s” diarrhea. Malaria is one of the most serious risks in places where *Anopheles* mosquitoes carry the disease. This section addresses disorders that may encounter outside North America, including ones for which immunization may be advisable, precautions are essential, and diseases that are an occupational risk associated with mineral exploration work.

The goal of this section is to present travel health information to educate mineral exploration employees on how to manage and mitigate the risks they will experience when travelling. Health related topics are addressed in this section and as listed below:

- Refer to 18.6.5 Diseases in chapter 18 for information regarding diseases that are routinely prevented by immunization or are typically found in North America (e.g., tetanus, polio, measles, Lyme disease, giardiasis, tuberculosis, Hantaviral diseases).
- Refer to 9.9 Cold Injuries in chapter 9 for information about hypothermia, frostbite and immersion foot.
- Refer to 9.10 Heat Illnesses in chapter 9 for information about sunburn, heat exhaustion and heat stroke.
- Refer to 9.11 Altitude Illness in chapter 9 for information about the various forms of altitude illness.
- General travel health information can be found on the following websites:
<http://www.phac-aspc.gc.ca/tmp-pmv/info/index-eng.php>
<http://www.phac-aspc.gc.ca/tmp-pmv/travel/advice-eng.php>

12.8.1 Ear Barotrauma and Jet Lag

Ear barotrauma (also known as aero-otitis, barotitis, and ear squeeze or airplane ear) is caused by variations in aircraft cabin pressure and occurs most commonly during descent. It can cause

acute pain, noise in the ear and temporary deafness. The risk is higher when you have a cold or other upper respiratory tract congestion, as they affect the ear's ability to adapt to changes in air pressure.

Tips to reduce the effects of barotrauma:

- Yawning or holding your nose and blowing against closed lips can help equalize pressure between the middle ear and the cabin pressure.
- Avoid flying when you have a head cold or "flu". If it is necessary, carry a nasal spray or antihistamine tablets and use them well before you commence ascent or descent.
- Ear plugs (such as "Ear Planes") can be purchased that assist in relieving air pressure during flight or mountain descent. These devices can be purchased online or at local pharmacies for less than \$10.
- Additional information about ear barotraumas or "airplane ear" can be found on the following website: <http://www.mayoclinic.com/health/airplane-ear/DS00472>

Jet lag develops when your personal internal day-night pattern (circadian rhythm) does not fit with the day-night pattern at the destination. This can result in fatigue, insomnia, loss of appetite and forgetfulness etc. Generally the effects are worse the more time zones you cross and with increasing age. Jet lag may be more intense if you are tired when you start a trip, when you travel in an easterly direction, and/or when you overindulge in food or alcoholic drink en route. Consult a doctor if you are considering medication for jet lag and be aware of possible side effects.

Tips for reducing jet lag:

- Get a good night's sleep prior to departure so you are well rested.
- Try to fly during daylight hours.
- In-flight cabin air is extremely dry. Drink plenty of fluids to counter dehydration. Water is best; avoid or limit alcohol and caffeine consumption.
- Eat light meals. Eating carbohydrate-rich rather than protein-rich meals may help adjust to new time zones.
- Try to sleep during a long flight. Blindfolds, ear plugs, inflatable neck rests and pillows may help increase comfort. Remove or untie shoes.
- Melatonin helps some people. Its status as a prescription or non-prescription drug varies depending on the country. Check with a medical expert if you have any medical issues because some tablets contain other compounds (e.g., herbs that interact with prescription medications).
- While you are awake, exercise by walking or standing in the aisles about every hour. Do some muscle stretching exercises while seated and walk during stopovers.
- If available, make use of showers during stopovers on a long haul flight. A shower is refreshing and helps improve circulation.
- At your destination, take a walk in the sun at the first opportunity and try to avoid sleeping during the day.
- Additional information regarding jet lag is available on the following websites:
<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/03vol29/acs-dcc-2-3/acs-3.html>
<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/jet-lag.aspx>

12.8.2 Deep Vein Thromboses (Blood Clots)

When you sit during long flights or long uninterrupted vehicle travel, blood clots may develop in the leg (deep venous thromboses or DVTs), which can be very painful and potentially fatal. A blood clot can break up and move through your body and lodge elsewhere, such as the lungs and cause a pulmonary embolism, which is potentially fatal. Consider taking preventive actions during a long flight. For people working in mineral exploration, it is not unusual to fly for ten or more hours to another country or continent and immediately after the flight start a long drive of perhaps ten or more hours to a field project. Thus, one's legs may not get significant exercise for 20 to 30 hours. This greatly increases the risk of blood clots.

- Wear loose comfortable clothing, especially from the waist down. Avoid tight clothing, including socks.
- Exercise by stretching or walking in the aisle about every hour when awake. While seated, do stretching exercises for leg muscles and flex the feet to reduce potential swelling. Remove or untie shoes.
- Walk for at least 10 minutes rather than remain seated during a stopover.
- Consider wearing compression stockings if you have a risk of venous thromboembolism.
- Seek medical attention if any unusual swelling or pain develops in your legs after a flight or drive.
- If you are immediately undertaking a long drive after a long flight, insist that the driver stop every couple of hours and take time to stretch and walk around before resuming the trip. It is preferable to have a break, perhaps overnight, between a long flight and a long drive.

12.8.3 Safe Food and Water in Developing Countries

When you travel or work in places where hygienic standards are questionable, be cautious about what you eat and drink. Food or drink may cause illnesses if they are contaminated with bacteria, parasites or viruses etc. Contamination may easily occur where there is a sub-standard water supply or an inadequate standard of cleanliness for food storage, preparation and handling. Diarrhea is the most common disorder caused by food or water contamination and affects many travellers. Be aware of potential sources of food and drink contamination and, if necessary, be prepared to purify your own water. The aim is to avoid bacteria such as *Salmonella* and those that cause cholera, typhoid and dysentery; viruses such as those that cause hepatitis and polio; and parasites such as tapeworms, hookworms and *Giardia* cysts.

Travellers should become well briefed on health issues including diseases, food and water safety, personal safety and travel hazards in the area where they will work. Obtain up-to-date information from a travel medicine clinic or medical advisor. Project managers in developing countries should consult with local public health officials about the safety of water, milk, meat and other food items in the area. Public health officials are generally better informed about these issues than local doctors.

12.8.3.1 Safe Food Guidelines

Safe food guidelines regarding restaurants

- Choose local restaurants that are recommended by business contacts, hotel managers or other reliable sources. If you are in doubt about food safety, it is better to eat at a high quality hotel.
- Note the cleanliness of the cutlery, plates, glasses etc. Also check the state of the toilets as a possible indication of the cleanliness. If you see many flies inside a restaurant (or a lot of garbage outside), it may be better to eat elsewhere.
- Never eat food sold by street vendors unless there is no alternative. Then, eat it only if it has been thoroughly cooked in front of you and handled minimally by the vendor. It is advisable to bring your own clean container and utensils.
- Wash your hands thoroughly before eating and carry hand sanitizer for use when handwashing is not possible. If possible, do not eat with your hands.

Safe food guidelines for developing countries

In brief, follow the standard advice. "Boil it, cook it, peel it, or forget it!"

- Only eat meat and fish that have been completely cooked (boiled, steamed, grilled) and served hot. Beef and pork should be well done with no pink or "rare" areas. Do not eat rare or raw fish, shellfish or meat. Do not eat cold meat or cold cuts (cold preserved meats).
- Only eat vegetables that are thoroughly cooked. Do not eat raw vegetables or green salads – especially those served in restaurants, as it is impossible to clean greens thoroughly.
- Be cautious about eating peeled fruits and vegetables. Choose those that are unblemished and peel them yourself. Wash the skins, the knife, and your own hands before peeling so that you do not transfer bacteria directly to the food (bacteria are easily carried from peel to knife to food). Do not eat fruits with punctured skins, that show signs of mould, or melons that could have had water injected into them before being sold.
- Canned and boiled milk is safe. Do not eat unpasteurized dairy products because they may contain tuberculosis or brucellosis bacteria.
- Do not eat milk products, ice cream, custards or frozen desserts, as these may contain untreated water or be contaminated with bacteria. Generally, one should avoid dairy products in developing countries because they are so easily contaminated.
- Do not eat raw or soft-cooked eggs. Hard-boiled eggs served in the shell are safest. Sauces and salad dressings containing eggs such as mayonnaise are not safe.
- Do not eat foods that have been left out in the sun, re-warmed or recycled. Avoid leftovers. Buffet foods are risky as they are set out for a period of time and may not be heated or cooled sufficiently to be safe.
- If microwaving your own food, microwave it thoroughly until it is very hot. The microwave process does not uniformly heat food and therefore it does not always raise the temperature enough to destroy bacteria on the surface of food.
- Avoid food and drink served on flights that originate, travel within or stopover in developing countries. Bring your own food and bottled water if possible. Be cautious of food, water and ice on airlines returning from areas with questionable sanitation. Even

though a flight may originate in a developed country, it may be resupplied in a country with lower sanitary standards.

- In developing countries where local cultures have hospitality traditions, try to avoid appearing in villages at meal times. Explain to the village leaders that you have already eaten. Emerge from your vehicle and approach the leaders while drinking water from your own container so that they will not urge you to drink their water. This may not be possible in some places.
- In Muslim countries, try not to eat with your left hand, if possible. There, the left hand is considered unclean because it is used for personal hygiene; to eat with it is considered offensive. Also, try not to touch anyone with your left hand.

12.8.3.2 Safe Water and Drinks

When travelling (usually outside Canada, the USA, and Europe) it may be necessary to purify your drinking water, even in cities, as it may be impossible to be absolutely certain that it is safe to drink. Some communities in Canada are subject to “boil water” alerts and even remote lakes can be contaminated so that water requires treatment to be potable. In many countries, fecal matter from human and/or animal waste products is a major source of contamination due to poor sanitation practices. Water for consumption, which includes water for brushing teeth, should be purified to kill disease causing organisms. By drinking untreated water, you may be exposed to many water-borne diseases, including hepatitis, giardiasis, dysentery, typhoid and cholera. In most countries, it is best to regard all surface water sources as unfit to drink.

All field exploration projects and camps – no matter where they are located – should test the water supply and treat it as required according to jurisdictional regulations (refer to chapter 18, section 18.6.3 Drinking Water Safety).

Know the source of your drinking water. In some places, the water may be suspect, even in a luxury hotel.

- Water for consumption should be boiled, chemically treated and/or filtered in developing countries. Avoid untreated tap water.
- Hot tap water may be safe if it is reliably filtered and treated, but do not drink it if you are unsure.
- Commercially bottled water is safe if it is from a large dependable company. Request carbonated water to verify that the bottle was not simply refilled with local water and recapped. Break the seal yourself to make sure the seal has not been broken.
- Beverages made with boiled water such as tea and coffee, canned or bottled carbonated drinks, beer and wine are safe to drink as long as it is clear the bottle has not been opened.
- Beverages are only safe if they are served in a clean glass. Use your own container or use a straw sealed in paper or plastic. It is advisable to carry a supply of sanitary straws to some destinations.
- Ice is only safe if it is made from safe water. Avoid ice blocks and ice cubes in restaurants, as they are often made from untreated water. Freezing water or adding alcohol to water will NOT make it safe to drink.
- Always brush your teeth with water that is safe to drink. If safe water is unavailable, put the hottest possible tap water into a clean glass and let it cool (without ice) before using it.

- Do not drink water from natural waterways, dams or livestock watering points, as it may be contaminated with bacteria, viruses or chemicals, or it may have a high salt content.
- In many countries, remote wilderness lakes and streams contain enough diarrhea-causing *Giardia* parasites or coliform bacteria to make water treatment necessary.
- Standard water purification methods will not remove arsenic or other chemicals from water. Where arsenic or other chemicals are a problem, drink only bottled water – but know the source of this water. Seek dependable local knowledge.

12.8.3.3 Water Treatment in Remote Areas or Developing Countries

This section addresses methods for travellers to use to purify small quantities of drinking water.

Generally, water is safe to drink when it is treated by boiling, chemical treatment, filtering or a combination of these processes. The aim is to avoid bacteria, viruses, cysts and larvae of parasites that will make you sick. A travel medicine clinic will provide information on specific water treatment methods and apparatus appropriate for your destination(s). A variety of chemical treatment tablets, filtering mechanisms, purifying cups, and sports-type water bottles containing purifying filters are available. Apply the appropriate water purification instructions when working in a remote fly camp if the water source is potentially contaminated.

Always store purified water in clearly labelled, closed containers and keep them separate from unpurified water. Rinse the containers with a weak bleach solution before refilling them.

- **Boiled water is safe to drink.** While it is time consuming and may be awkward, boiling is the best method to purify drinking water.
 - Bring water to a vigorous rolling boil and then allow it to cool without adding ice. Water does not have to boil for long (one minute is sufficient) as the heating process kills most harmful organisms.
 - At altitudes above 2000 m, it may be advisable to boil water for three minutes as an added measure of protection.
 - An electric immersion water heater may be adequate for boiling small amounts of water, but remember that the container itself must be clean.
 - Store boiled water in a sterile closed container – bring your own container if you anticipate that none will be available. Purified water can easily be contaminated again if it is not stored properly.
 - Pregnant women should drink boiled water in preference to chemically treated and/or filtered water.
- **Chemically treated water is safe to drink.** The required length and strength of treatment depends on water temperature, pH level, and the amount of sediment in the water. The contact time is important because chemicals must be in contact with the organisms to kill them. Treatment works best if water is over 21°C so start with the hottest tap water available, as it is likely to be less contaminated than cold tap water. Let the water stand for at least 30 minutes after treatment. If the water is cold when treatment begins, it should stand for a longer time before use. It may be advisable to filter water before chemically treating it, especially if it is very cold. Cloudy water must be filtered before chemical treatment, as cloudiness indicates the presence of sediment that may conceal disease-producing organisms.
 - Iodine is available as drops, tablets or crystals. Carefully follow the directions for the type of iodine used.

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- Iodine tablets have an expiry date and are ineffective after the date. Iodine tablets decompose readily, have a short shelf life, and must be stored in a dark bottle as they are light sensitive. It is advisable to replace them frequently; purchase a new supply if there is any doubt about the viability of the tablets.
- For a 2% solution of tincture of iodine, add the correct number of drops to one litre of clear water. The water should not taste of iodine.
- Some people are allergic to iodine and some people should not be exposed to it due to health risks, age or medications so check with a travel physician before using it.
- Chlorine products can often be used by people who cannot use iodine. Halazone tablets are a chlorine purification product. Follow the directions that accompany the product.
- Bleach: For a 4-6% solution of regular chlorine laundry bleach (sodium hypochlorite), use 2 drops to one litre of water or until it smells slightly of bleach. Do not use non-chlorine bleach to disinfect water.
- Cloudy water and water that may contain *Giardia* cysts or *Cryptosporidium* must be filtered before chemical treatment. Bleach and iodine will not necessarily destroy either *Giardia* cysts or *Cryptosporidium*. Water should also be boiled or filtered with the proper type and/or size of filter to remove the cysts or sediment (see Filters: below).
- Pregnant women and women on long term assignment should consult a medical advisor about the safe duration of drinking iodine-treated water, as extended exposure to iodine may cause goitre, especially in women and children.
- **Filtered water should be chemically treated or boiled after it is filtered.**
 - Filters: Filtering water eliminates sediment, bacteria, larvae and cysts that are larger than the filter pores. Some systems use multiple stage filters where the first stage removes sediment and the second stage removes protozoa and bacteria. Some filters incorporate a third stage with an iodine resin to eliminate viruses. For information regarding filters to use for removing *Giardia* and *Cryptosporidium* cysts, refer to the following website:
<http://www.cdc.gov/crypto/factsheets/filters.html>
 - Filter systems must be maintained to be safe because they clog up quickly. Filters may break down over time and it can be difficult to detect cracks in them.
 - Infants and children should avoid filtered water unless an iodine resin is present in the system. Nevertheless, one should maintain caution about the use of iodine filters.
 - If water is very cloudy, filter it through a clean cloth to help remove sediment. Let the water stand and then decant the clear water for treatment by boiling or chemicals, or even passing through an appropriate filter system.

Additional information regarding water purification can be found at the following websites:

<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/water-disinfection.aspx#Drinking>

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/outdoor-plein_air-eng.php

<http://www.epa.gov/OGWDW/faq/emerg.html>

<http://www.high-altitude-medicine.com/water.html>

http://www.atlantispurewater.com/index_files/page0001.html

12.8.3.4 Safe Water for Swimming and Bathing

Some water may not be safe for swimming or bathing. Be aware of the quality of surface waters where you work. Know which parasites may be present and treat water to kill them.

- Avoid swimming in any fresh water or seawater where there is any suspicion of sewage contamination.
- Do not swim in or dive into stagnant waters; they often contain bacteria that can enter your mouth, ears, nose and sinuses and cause illness.
- It takes very few cysts to infect a person with **Giardiasis** (beaver fever), a disease that may cause severe diarrhea. It is unwise to drink or swim in any water that might be contaminated with these parasites. This includes beaver ponds and cold mountain lakes, as *Giardia* cysts thrive in a cold alkaline environment. Giardiasis is common in remote areas of North America. In the Middle East, India and western Russia, Giardiasis is a common form of traveller's diarrhea as cysts may be present in the public water supply (see sections 12.8.5.14 and 18.6.5.2 in chapter 18).
- Schistosomiasis (*Bilharzia*) parasites frequently occur in fresh water in tropical Africa, parts of tropical Central, South America and the Caribbean, and parts of Asia. These microscopic parasites are released from snails and the parasites may be present in water even when you cannot see the snails. It is not safe to drink, swim, wade or otherwise come in contact with fresh water that contains these parasites. They will invade through your skin if they are present (see section 12.8.5.13). Water can be made safe from schistosomiasis and used for swimming and bathing by the following methods:
 - While it may not be practical, snail-free water left to stand in a securely covered container for 48-72 hours can be used for bathing. It will be free of parasites that cause schistosomiasis (but not necessarily free of *Giardia* or *Cryptosporidium*).
 - Water heated to 50°C (125°F) for more than 5 minutes is safe from schistosomiasis parasites.
 - Unpolluted seawater and chlorinated swimming pool water are safe.

12.8.3.5 Fluid Replacement Therapy

An attack of diarrhea or vomiting can leave your body dehydrated. There are several choices when fluid replacement therapy (oral rehydration) is required. Commercially available pre-packaged mixes of balanced electrolyte-glucose solutions are easy to prepare. It is advisable to carry the packets on trips where you risk getting diarrhea.

You can also mix your own from commonly available ingredients. Sip alternately from each glass if you use the two-glass method. Drinking a succession of hot caffeine-free teas, broths and carbonated drinks will also help replace fluids and salts, but avoid milk and beverages that contain caffeine or alcohol. Be sure to use purified water when preparing fluid replacement solutions. If purified water is not available, it is better to use impure water than to avoid fluid replacement therapy altogether.

FLUID REPLACEMENT THERAPY Home Preparation Electrolyte Solution		
TWO-GLASS METHOD		SINGLE GLASS METHOD
Drink Alternately from Glass 1 and Glass 2		Potassium Chloride ¼ tsp (1 ml) (salt substitute) Sodium Bicarbonate (Baking Soda) ½ tsp (2 ml)
GLASS 1	GLASS 2	
Fruit Juice 8 oz (250 ml) Honey or Corn Syrup ½ tsp (2 ml) Table Salt (pinch)	Water 8 oz (250 ml) Sodium Bicarbonate (Baking Soda) ¼ tsp (1 ml)	Table Salt ½ tsp (2 ml) Glucose 2 tsp (25 ml) or Sucrose 4 tsp (50 ml) Water 8 oz (250 ml)

Figure 12.1: Fluid Replacement Therapy

In an emergency, an adequate rehydration mixture can be made using:

- 2 ml (½ level teaspoon) table salt
- 30 ml (6 level teaspoons) regular table sugar (not substitute)
- 1 litre of boiled water

While this mixture contains no potassium or bicarbonate, it is better than drinking plain water or soft drinks. “Sports drinks” can also be used; it is advisable to dilute a full strength sports drink by adding 50% more water to the solution. The additional water helps dilute the high level of sugar and assists with the absorption of the electrolytes. Do not use a high caffeine “energy drink” for rehydration purposes. It is never advisable to administer drinks containing caffeine to anyone suffering from dehydration, hyperthermia or hypothermia. Caffeine, carbonated drinks and beer increase urine output and therefore they contribute to dehydration.

12.8.4 Protection from Insect Bites

Insects carry organisms that cause many diseases and they can transfer pathogens into your body with a single bite. Some insects may cause serious diseases in some parts of the world. Fortunately, by protecting yourself from mosquito bites, you also protect yourself from ticks, sandflies, blackflies, tsetse flies and leeches. Avoid colognes, perfume or hairsprays, as the scents attract insects. Use unscented shampoo and soap.

Definitions

Insect repellents contain an active ingredient that repels insects from the body. They do not kill insects.

Insecticides contain an active ingredient that kills insects on contact (adults, larvae or eggs).

In Canada and the USA, biting insects may be a mere nuisance or a serious distraction. Depending on the project location and/or field area, it may be important to prevent bites. Mosquitoes carry West Nile virus and western equine encephalitis. Ticks carry Lyme disease and Rocky Mountain spotted fever, and fleas occasionally carry plague. To help reduce the numbers of insect bites, wear appropriate clothing, use insect repellent on exposed skin and apply insecticide to clothing.

In Central and South America, Africa, and Asia, insects may carry significantly more serious and even fatal diseases than in North America. Additional preventive measures are required. Only by using multiple approaches can you successfully avoid insect bites. Studies show it is possible to achieve excellent protection from mosquito bites if you (1) use insect repellents with DEET on exposed skin, (2) wear permethrin-treated clothing, (3) spray living/sleeping quarters with insecticide and use permethrin treated mosquito netting at night. DEET is the abbreviation for the chemical N, N-diethyl meta-toluamide. Use pyrethroid-containing knockdown sprays that kill insects on contact. (Permethrin is a pyrethroid chemical.) Check with a travel medicine clinic to confirm your vaccinations are up-to-date and learn which diseases to protect against at the project location or travel destination. It is still necessary to take anti-malarial medication if you travel to a place where malaria is a risk.

The following website has extensive information regarding important disease carrying insects, the prevention of insect bites, the use of various repellents and insecticides: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/05vol31/asc-dcc-4/index-eng.php>

Prevention and preparation

Barriers – physical and chemical – are the best means of protecting yourself from insect bites.

1. Clothing

- Wear long sleeves and long pants tucked into your socks. Protect yourself any time you work in areas where ticks and day-feeding insects are a problem. Make a special effort to protect yourself between dusk and dawn to avoid being bitten by night-feeding mosquitoes.
- Clothing fabric should be tightly woven and thick enough to provide an added barrier.
- Clothing should be sprayed with insect repellent (DEET) or treated with permethrin, a contact insecticide. See the section below: How to treat clothing and bed nets.
- Permethrin-treated expandable athletic cuffs and headbands act as barriers, especially for ticks and blackflies. Pyrethroid-containing sprays (insecticides) are more effective than DEET against deer ticks that may cause Lyme disease.
- Net bug jackets treated with permethrin are good barriers when worn over clothing. Although they interfere with vision, head nets are very helpful protection against swarms of mosquitoes and black flies.
- Wear shoes and socks; do not wear sandals.
- When using both sunscreen and insect repellent, apply the sunscreen first, preferably 30 minutes before applying insect repellent.

2. Insect repellents and insecticides

- A repellent containing DEET is most effective for use on skin. For adults, use 15% to 35% DEET on your skin as recommended by doctors. Above this concentration, toxic reactions might occur, as it is absorbed through the skin. Children should use 10% DEET or less. Pregnant women should use as little

insect repellent as possible (no more than 10% DEET). Some cream style repellents contain a polymer to prevent absorption. Ask your local pharmacist to recommend specific brands and check the contents. You may spray or immerse clothing with 95% to 100% DEET.

- Apply repellent to all exposed skin and reapply it every two to four hours, depending on the strength. Follow the application instructions and take time to apply it evenly and thoroughly onto your face, neck and limbs. Insects tend to bite where veins are near boney surfaces so pay extra attention to these areas (wrists, ankles, skull, jaw line, and shoulder blades). Do not apply it next to your eyes, on your lips or over cuts or skin irritations. Wash repellents off your skin when protection is no longer needed.
- Reapply insect repellent more frequently if you get wet (sweating, swimming, rain) or when there are lots of insects.
- Avoid breathing the sprays of repellents and insecticides and do not apply them near food.
- Warning: DEET will affect the surface of plastic or synthetics, including vehicle seats and the plastic lenses of eyeglasses.
- Do not use insecticide on your skin. Pyrethroid-containing sprays should be applied to clothing and living quarters. These sprays can also help control bed bugs.

3. Bed Nets – for use in places where disease-transmitting insects are a hazard

- Your sleeping bag or bed should be surrounded with permethrin-treated mosquito netting when you must prevent insect bites. A variety of bed nets are available. Some must be suspended and some come with collapsible poles for support.
- Place the net over the bed before dusk and keep the net tucked under the mattress to prevent insects gaining entry. Use a knockdown spray inside the net.
- Do not sleep in a position where you touch the net as insects may bite through the net.
- Store the net carefully during the day and search it carefully for insects and holes each night before bed. Mend holes with tape.

4. Knockdown sprays (insecticides)

- Use aerosol insecticide sprays containing pyrethroids or permethrin because they kill insects on contact.
- Spray the bedroom, bathroom and inside your sleeping net 30 minutes before going to bed.
- Spray all window and door curtains to reduce the number of insects. Windows and doors should be tightly screened.

How to treat clothing and bed nets

Protection against insect bites is greatly increased when you use spray or immerse clothing and bed nets in insecticide. The effectiveness lasts through several washings or up to six weeks without washing. While 95% to 100% DEET may be used, permethrin is a better product to use because it kills insects on contact and protects longer. It is not toxic to humans, but it may cause minor skin irritations. Store the treated garments and bed nets in plastic bags out of direct sunlight when not in use.

- **To spray clothing or gear:** Permethrin sticks to fabrics but does not damage or stain them. It works best on cotton fabrics.
 - Lay the items flat and spray each side for 1-2 minutes.
 - Hold the can 30 cm away and spray back and forth.
- **To immerse bed nets:** Exact instructions for treating mosquito bed nets are given in Appendix 1 of the document on the following website:
<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/05vol31/asc-dcc-4/index-eng.php>

12.8.5 Diseases

The following diseases are arranged alphabetically for easy reference. This section contains diseases that are encountered more frequently outside North America. Diseases commonly found, or that are more prevalent, in North America are located in chapter 18, section 18.6.5 Diseases.

12.8.5.1 Chagas Disease (Trypanosomiasis – American)

Description

Chagas disease is transmitted by the triatoma beetle, also known as the kissing bug, assassin bug or vinchuca. This beetle is found throughout rural areas of Central and South America. They inhabit palm trees, thatched roofs and the roofs and walls of mud, adobe or cane dwellings. At night, insects drop onto a bed and bite a victim. They feed on blood and then excrete protozoan parasites in their feces onto the victim's skin, which the victim inadvertently rubs into the bite. A nodule, chancre or ulcer (chagoma) develops at the site of the bite. Chagas disease may also be transmitted through blood transfusions in countries where the disease is common and blood products are unscreened.

Prevention

Prevention is the key. Unless medical treatment is begun during the acute stage soon after exposure, it will progress to chronic progressive heart disease. Then, there is no effective treatment and the disease is generally fatal. If you work where Chagas disease is present, take active measures to prevent bites and eradicate the insects from your quarters.

- Do not construct housing with adobe, mud, straw and with local thatch materials in the roof or rafters.
- Fumigate all buildings whenever you occupy an uninhabited camp. The bugs hide in cracks and crevices as well as thatch materials.
- Use appropriate knockdown insecticides indoors.
- Sleep under a treated mosquito net. Use a knockdown spray inside the sleeping net before bed.
- Search your bed and living area for insects; the beetles are large (2.5 cm) and easy to spot.
- Avoid blood transfusions or used needles that may transmit the parasites.
- Do not consume uncooked food contaminated with feces of assassin bugs.

Symptoms

- A swollen nodule forms at the site of the bite; the skin may lose its pigmentation there. A swelling of one eyelid and then a facial lymph node develops after one to two weeks.
- Other symptoms include fever, swollen lymph glands, rash, spleen or liver enlargement.
- Symptoms may subside after a few months but the disease continues to develop in internal organs causing them to enlarge. If the heart enlarges, congestive heart failure develops.
- This disease can be confused with malaria, eye infections, mumps or sinusitis.
- A blood test is necessary for diagnosis.

Areas of concern: Mexico, Central and South America

Additional information regarding Chagas disease:

http://www.phac-aspc.gc.ca/tmp-pmv/info/am_trypan-eng.php .

<http://www.cdc.gov/chagas/factsheets/detailed.html>

12.8.5.2 Cholera

Description

Cholera is caused by a bacterium. It is spread through sewage-contaminated food and water. While it can be life-threatening, it is preventable and easily treated. You should seek immediate medical treatment for cholera because dehydration can develop rapidly, sometimes within a few hours. Fluid replacement therapy is important. To prevent cholera, pay careful attention to the quality of food and water you consume in developing countries.

Symptoms

- Symptoms of severe cholera include massive, watery, light coloured diarrhea that is relatively painless. It is sometimes referred to as rice water diarrhea.
- Vomiting
- Leg and muscle cramps

Prevention

Avoid contaminated food and drink.

- Do not eat raw or undercooked food – especially seafood. Foods should be fully cooked and served hot.
- Drink only boiled, bottled or treated water and other safe beverages. Do not drink beverages containing ice unless it is made with purified water.
- Wash and peel away all fruit and vegetable skins.
- Wash your hands before eating, drinking and preparing food.

Areas of concern: Africa, Indian subcontinent, Asia, Central and South America

Additional information regarding cholera: <http://www.phac-aspc.gc.ca/tmp-pmv/info/cholera-eng.php>

12.8.5.3 Dengue Fever

Description

Dengue hemorrhagic fever is also known as Philippine hemorrhagic fever, Southeast Asian hemorrhagic fever, and Thai hemorrhagic fever. Other names include Breakbone fever and dandy fever.

Dengue fever is a common viral disease in tropical and subtropical regions. Dengue fever is spread by the *Aedes* mosquito that lives indoors and outdoors in urban areas. This mosquito usually feeds during the day and at twilight and lives in close association with humans. There has been a marked increase in the incidence of dengue fever, especially in the tropical and subtropical parts of Central and South America and the disease is spreading northward.

If you suspect that you have contracted dengue fever, seek medical attention as soon as possible. Dengue fever sometimes has a hemorrhagic component so do not use aspirin and ibuprofen (non steroidal anti-inflammatory medications). Use only Acetaminophen or paracetamol products because the fever itself can cause bleeding. This severe form of dengue fever may be fatal.

Symptoms

- Dengue fever starts 2 to 8 days after the infecting bite and lasts 5 to 7 days.
- Symptoms include sudden high fever, severe headache, fatigue, severe muscle and joint pains. Initial symptoms can resemble malaria.
- A fine itchy rash accompanies the fever. Dengue may be difficult to distinguish from malaria, flu or yellow fever until the rash appears.
- A second stage includes fever, another rash and general weakness.

Prevention

Take active measures to prevent mosquito bites.

- Use insect repellent (DEET) on skin and spray clothing with permethrin. Pay particular attention to the feet and ankles as most *Aedes* mosquitoes bite below the waist.
- Use mosquito nets and spray your living quarters.
- If you or a co-worker has dengue fever, make sure that mosquitoes do not bite the sick person and spread the infection to others.

Areas of concern: Central and South America, the Caribbean, Asia, tropical Africa, the Pacific Islands

Additional information regarding dengue fever:

<http://www.phac-aspc.gc.ca/tmp-pmv/info/dengue-eng.php>

<http://www.who.int/mediacentre/factsheets/fs117/en/>

12.8.5.4 Hepatitis, Viral

Description

There is a large group of viruses that cause inflammation of the liver. The symptoms range from mild and flu-like to fatal liver failure. The hepatitis viruses are transmitted in various ways and all strains of the disease are serious. Protect yourself from exposure by being immunized against hepatitis A and B.

Symptoms

- Symptoms may occur 4 to 6 weeks or more after exposure, depending on the type.
- Typical symptoms include fatigue, loss of appetite, jaundice (yellow coloured skin and eyes), dark urine, fever, abdominal pain and aching joints. Rash is often an early symptom.
- A blood test is required to confirm a diagnosis.

Hepatitis A

Hepatitis A is the most common form.

Transmission

- Hepatitis A is spread through fecally contaminated food and water, usually in locations with poor sanitary conditions. Food handlers may spread it if they do not wash their hands properly.
- Contaminated shellfish and contaminated water are frequent sources of the virus.

Prevention

- Be immunized. A vaccine is available and recommended for frequent travellers or those going to a location where hepatitis A is a risk.
- Follow safe food and water precautions, especially in developing countries where there is poor sanitation.

Areas of concern: Worldwide

Additional information regarding hepatitis A:

<http://www.phac-aspc.gc.ca/tmp-pmv/info/hepa-eng.php>

<http://www.cdc.gov/hepatitis/A/aFAQ.htm#>

<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/hepatitis-a.aspx>

Hepatitis B

Hepatitis B is a more serious infection than hepatitis A. Potentially severe complications may follow infection including cirrhosis, liver cancer and chronic hepatitis. Hepatitis B can be fatal.

Transmission

This highly infectious form of hepatitis is directly transmitted by exposure to infected blood and body fluids. It is spread by the following ways:

- Person to person during sexual contact and childbirth
- Exposure to infected blood (e.g., transfusions, blood splashed into the eyes or an open wound)
- Exposure to blood-contaminated objects (e.g., needles, syringes, razors, inadequately sterilized medical equipment). This may occur during activities such as the sharing of razors, or during tattooing, acupuncture, ear/body piercing, and through the injection of drugs.
- Ingesting food or water contaminated with human excrement or urine containing the hepatitis B virus.

Prevention

- Be immunized. A vaccine is available to protect against hepatitis B.
- Avoid sharing personal items that may be contaminated with blood, including razors and toothbrushes.
- Eliminate risky behaviours: Practice safe sex. Avoid using illegal drugs.
- Prevent injuries and the need to receive unscreened blood products.

Areas of concern: Africa, Asia, South Pacific Islands and South America

Additional information regarding hepatitis B:

http://www.phac-aspc.gc.ca/hcai-iamss/bbp-pts/hepatitis/hep_b-eng.php

<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/hepatitis-b.aspx>

Hepatitis C

No immunization is available to prevent this form of hepatitis.

Transmission

- Hepatitis C is usually transmitted by unsafe sexual practices, contaminated needles or unscreened blood transfusions.
- Hepatitis C is *not* spread through contaminated food and water.

Prevention

- Do not share personal items such as toothbrushes and shaving equipment.
- Eliminate risky behaviours: Practice safe sex. Avoid using illegal drugs.
- Prevent injuries and the need to receive unscreened blood products.

Area of Concern: Worldwide

Additional information regarding hepatitis C: <http://www.phac-aspc.gc.ca/hepc/faq-eng.php>

Hepatitis E

No immunization is available for this form of hepatitis.

Transmission

- Most outbreaks are believed to be spread through fecally contaminated water where poor sanitary conditions exist. Some outbreaks are unexplained.
- Hepatitis E is a serious risk for pregnant women – up to 25% of those who are infected during pregnancy will die of serious liver disease.

Prevention

- Do not drink untreated well or surface water in high risk areas.
- Drink only bottled, boiled or chemically treated water.
- If you use a filter system for water, it must have an iodine resin matrix to be effective against this virus.

Areas of concern: Indian subcontinent, Northern Africa, some parts of Asia, Eastern Europe and Central America

Additional information regarding hepatitis E: http://www.phac-aspc.gc.ca/hcai-iamss/bbp-pts/hepatitis/hep_e-eng.php

12.8.5.5 Histoplasmosis

Description

Fungus spores released from high concentrations of bat droppings or bird droppings may cause serious fungal infections (mycosis) in the human body. Usually the lungs are most seriously affected, as the victim breathes in the spores. However, rich organic soils may also contain enough spores to cause infection by exposure to an open wound. Old mine workings and caves that house large populations of bats may present a health risk to exploration employees who enter them.

Symptoms

- Fatigue, cough and fever usually appear within 5 to 18 days after exposure.

Precautions

- Avoid entering old mine workings or caves that may contain bat or bird droppings. If entry is absolutely necessary, wear a respirator to minimize your exposure to airborne spores. Only use a respirator with a high efficiency particulate air (HEPA) filter capable of filtering out particles that are two microns in size (the size of the *Histoplasma capsulatum* spores).
- Check frequently that your respirator is working properly.

- Thoroughly wash any clothing worn after exploring old mine workings or caves.

Areas of concern: Worldwide

Additional information regarding histoplasmosis:

<http://www.ccohs.ca/oshanswers/diseases/histopla.html>

12.8.5.6 Japanese Encephalitis (JE)

Description

Another name for this is Type B encephalitis.

Japanese encephalitis is a viral disease spread by night-biting *Culex* mosquitoes. The disease is endemic (always present) in Southeast Asia and epidemic (intermittently present) in Korea, China and far eastern Russia. It is most commonly found in rural areas, especially near pig farms as swine are a host. Wild pigs are also a potential host. It is more prevalent in the summer months (May to October) in epidemic areas and during the rainy seasons in endemic areas. Travellers to urban areas are at very low risk of contracting the disease. In rural areas, while only one in 200 infected people develop symptoms, of those cases 10% to 25% may be fatal and many survivors suffer permanent brain damage from the encephalitis.

Symptoms

- Nausea, vomiting, headache and fever
- Severe cases – lethargy, coma

Prevention

- Take precautions against mosquito bites, especially at night. Sleep under treated bed nets and use repellents or knockdown sprays on clothing.
- Vaccination against the disease is available. Discuss options with a travel medical advisor.
- Be vaccinated if you are traveling to a high risk area and you have no spleen or have a spleen that does not function (e.g., Thalassaemia, sickle cell anaemia).

Areas of concern: Asia, far eastern Russia, Papua New Guinea

Additional information regarding Japanese Encephalitis: <http://www.phac-aspc.gc.ca/im/vpd-mev/japanese-encephalitis-eng.php>

12.8.5.7 Legionnaires' Disease

Description

Other names include Legionellosis, Pontiac Fever.

Legionnaires' disease, a serious form of pneumonia, is a bacterial infection that is spread by breathing aerosol droplets of water contaminated with the *Legionella* bacteria. It is not spread from person to person. *Legionella* thrive in warm, moist places and may be present in high numbers in some types of water systems. These include evaporative condensers of large air conditioning units, cooling towers, swamp coolers, whirlpools or spas, and humidifiers or

fountains that create a fine water spray and/or contain warm and stagnant water. The bacteria may flourish in industrial, commercial, or small domestic water systems. Notable epidemics have been traced to sources in poorly maintained air conditioning systems in buildings such as hotels or hospitals. Projects should carry out appropriate maintenance of their water systems.

Many cases of Legionnaires' disease are unreported, as diagnosis is impossible without special tests to distinguish it from other forms of pneumonia. Once diagnosed correctly, the disease is treated with antibiotics. Seek medical attention as soon as possible should you develop pneumonia-like symptoms.

Symptoms

- Early flu-like symptoms include fever, chills, mild cough, tiredness, aching joints and muscles.
- Pneumonia-like symptoms include high fever >40°C, a dry cough that develops into a productive cough, shortness of breath, chills and chest pains. These symptoms may develop rapidly after the onset of the early flu-like symptoms. Seek immediate medical attention.
- Gastrointestinal symptoms including vomiting, nausea and diarrhea commonly occur.
- Legionnaires' disease has a mortality rate about 15%. Symptoms appear between 2 to 10 days after exposure – usually after 5 to 6 days.

Prevention

You cannot determine when you risk exposure to Legionnaires' disease, as you have no control over the maintenance of water systems in public places. You may become exposed even by being downwind from a contaminated water system. Note: Small windowsill type air conditioners have not been found to be a significant source of *Legionella*. Companies should be aware of the following information and see that projects with vulnerable water systems follow good maintenance procedures.

Eliminate conditions that promote the growth of *Legionella* bacteria, which include:

- Heat: Keep hot water systems set higher than 60°C. Hot water should be above 50°C when it comes out of a tap. *Legionella* bacteria grow rapidly in water between 20°C and 50°C.
- Sediment and scale: The presence of these promotes the growth of *Legionella* bacteria. In order to eliminate scale and sediment all tanks, swamp coolers, air conditioning equipment, spas, fountains, and humidifiers etc., should be drained periodically and cleaned with a chlorine compound if possible, and then rinsed to eliminate the chlorine compound.
- Common water organisms: Eliminate algae and other bacteria present in water systems because they provide nutrients and promote the growth of *Legionella*.
- Stagnant water: Eliminate areas of stagnant water in water systems.

Areas of concern: Worldwide

Additional information regarding Legionnaires' disease:
<http://www.ccohs.ca/oshanswers/diseases/legion.html>

12.8.5.8 Leptospirosis

Description

Other names include: Canicola fever, hemorrhagic jaundice, infectious jaundice, spirochetal jaundice, mud fever, swamp fever, caver's flu, swineherd's disease and Weil's disease.

This acute bacterial disease occurs more frequently in humid tropical and subtropical regions than in temperate climates. Usually, leptospirosis affects animals; however, it is an occupational hazard for field employees who are in contact with water or soil contaminated with animal urine and for mine workers because rats frequently spread the disease. One can contract leptospirosis if contaminated water or animal urine comes in direct contact with an open wound or the mucous membranes of the eyes, nose or mouth. Potential for exposure may increase after heavy rains and as a result of increased surface runoff, such as after floods. The disease is also transmitted by eating infected meat.

Symptoms

- Symptoms usually appear between 3 to 14 days after exposure.
- Symptoms start with the sudden onset of a severe headache, fever, chills, muscular pain and vomiting.
- Symptoms may be mistaken for those for influenza, hepatitis, dengue or hemorrhagic fevers, and even meningitis.
- The first phase is flu-like followed by a brief interim without fever and then symptoms reappear that include jaundice, rash, meningitis, and bleeding or kidney failure.
- If untreated, victims may develop organ failure, meningitis and/or respiratory problems. While uncommon, death may occur.
- Weil's disease (the most serious form) is identified by jaundice and bleeding in the skin and subcutaneous tissues.

Prevention

- Avoid swimming, bathing, or immersion in stagnant pools or sluggish streams, especially if you know that dogs or rats are in the area. Try to determine if water may be contaminated.
- Beware of the dangers of urine contamination if you befriend stray animals.
- Cover cuts and open wounds with waterproof dressings if they will come in contact with dirty water.
- Wear gloves and prevent exposure to soils that might be contaminated.
- Carefully wash (or avoid) fresh vegetables grown where soil might be contaminated with animal urine.

Areas of concern: Worldwide

Additional information regarding leptospirosis:

<http://www.phac-aspc.gc.ca/tmp-pmv/info/leptospirosis-eng.php>

<http://www.leptospirosis.org>

12.8.5.9 Malaria

Description

Malaria is a life-threatening disease and just one mosquito bite can infect you. Each year, between 300 and 500 million people develop malaria and between 1.5 and 3 million people die from the disease. Malaria is carried by the night-biting female *Anopheles* mosquito, which may infect humans with one of four species of parasites of the genus *Plasmodium*. Once injected into the bloodstream, the parasites invade the liver where they multiply and then destroy red blood cells. Although three forms of malaria are relatively benign, one form, *P. falciparum*, is a very dangerous and often fatal form of the disease.

The information presented in this section is limited and it is essential to seek up-to-date information from a physician at a travel medicine clinic. It is also advisable to access additional information from the references at the end of this section.

Risk of exposure to malaria

You risk exposure to malaria in any tropical region where infected mosquitoes are present. People living in North America and other non malarious regions are more susceptible to malaria because they have no immunities to the disease. The risk of contracting malaria depends on:

1. The degree of local risk at the destination, which depends on:
 - Length of stay
 - Time of year (rainy vs. dry season)
 - Style of living (urban vs. rural)
2. Your behaviour – whether you adhere to preventive behaviours
 - Avoid exposure to mosquitoes when they are active
 - Wear appropriate clothing that covers your body
 - Use insect repellents and insecticides appropriately
3. The efficacy of the prophylactic medication
4. Whether you take the prophylactic medication as directed – the medication does not kill all the parasites; technically, the medication is a suppressant.

Local risks include:

- Areas of highest risk generally include low-lying rural areas; the risk of exposure greatly increases during the rainy season.
- In Africa, especially sub-Saharan Africa, higher proportions of mosquitoes carry malaria. The disease is transmitted all year in both urban and rural areas.
- In Southeast Asia and South America, malaria is more prevalent in rural areas than in urban areas. The risk of exposure greatly increases during the rainy season.
- In some countries such as Papua New Guinea, malaria is prevalent both in low-lying areas and at high altitudes. The risk of exposure occurs all year.

Prevention and preparation for malaria – individual actions

To prevent malaria, it is necessary to focus on the four risk factors listed above. Understand that individual behaviour is a critical part of prevention. Take active measures to avoid mosquito bites

and take the correct prophylactic medication as *directed*. Even so, using both physical and chemical barriers combined with an anti-malarial drug may not be 100% effective. Be informed.

1. Prior to travel, check with a travel medicine clinic for up-to-date information about the risks at the destination and which prophylactic medication is appropriate. *P. falciparum* has rapidly developed drug resistances, which makes it very important to receive current information regarding prophylactic medication. Various anti-malarial drugs are available and you should discuss options with a physician at a travel medicine clinic. Check with a knowledgeable doctor where a clinic is unavailable.
 - Take a full supply of prophylactic drugs with you including enough to cover treatment in an emergency. Take the medication as *directed*. Complete the full course of medication even if the trip is very short.
 - Avoid buying anti-malarial medications in developing countries. Drug nomenclature is confusing and therefore you may not receive the correct medication in some countries. Many anti-malarial drugs marketed in developing countries are dangerous due to contamination and counterfeiting. The marketing of counterfeit anti-malarial drugs, especially in Southeast Asia and Africa, is a very serious, widespread and increasing problem. It is usually impossible to distinguish between real and fake drugs.
 - Controversial advice exists regarding prophylactic medication to prevent malaria versus rigorous preventative measures to avoid mosquito bites. Health care providers in some developing countries discourage the use of anti-malarial drugs. Do not discontinue your anti-malarial medication because of this reason.
2. Prevent mosquito bites from dusk to dawn, as malaria is spread by night-biting mosquitoes. Use physical and chemical barriers.
 - Wear light coloured clothing with long sleeves, long pants, and shoes and socks that cover your feet – especially in the evening. Clothing should fit loosely but be made of tightly woven fabric to provide a barrier against mosquitoes. Protection increases when clothing is treated with permethrin products or sprayed with DEET.
 - Use insect repellent on exposed skin. Doctors recommend those that contain 35% DEET (N, N-diethyl meta-toluamide).
 - Use permethrin-treated mosquito netting over your bed and tuck it under the mattress.
 - Thoroughly spray the bedroom, bathroom and inside the sleeping net before dusk with a knockdown insecticide containing permethrin. Make certain that all windows and doors are tightly screened.
 - Tip: Do not shower or bathe at dawn or dusk to reduce exposure to mosquitoes.
 - See section 12.8.4 Protection from Insect Bites for information regarding the proper use of bed nets and correct spraying procedures.
 - The following website has valuable information regarding the use of insect repellents and insecticides: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/05vol31/asc-dcc-4/index-eng.php>
3. No folk remedies work!

Prevention and preparation for malaria – corporate actions

Companies have a responsibility to protect the health and safety of employees. This includes developing practices that prevent employees from acquiring malaria and supporting employees should they become infected with the disease.

- Provide access to up-to-date information about malaria. In developed countries, this means employees should be able to access travel medicine clinics. Require employees to follow pre-trip health and safety routines (see section 12.3.1 Preparation Checklist).
- For exploration personnel based in countries that have malaria, especially developing countries, companies need to confirm that adequate medical care is present and available, and that personnel have access to reliable drug supplies.

Camps and projects located in malarious areas can decrease risks by eradicating mosquito breeding places as much as possible. The following are some measures that companies have found to be effective in reducing the incidence of malaria:

- Locate camps in dry open areas as far as possible from mosquito breeding areas.
- Camp structures for work and accommodation should be protected with tightly fitting insect screens on doors, windows and other openings. Screens must have a mesh size that excludes all mosquitoes and be checked continuously for holes. Repair holes and gaps immediately. There should be no cracks or holes in walls or roofs where mosquitoes can gain entry.
- Remove objects that hold or may contain water (e.g., cans, containers, tires). Fill in excavations, wheel ruts, tire tracks etc., and keep ditches drained. It takes very little water for mosquitoes to breed; therefore constant vigilance is necessary.
- Rigorously enforce a policy that requires sleeping under a treated bed net. Follow through with consequences when employees do not adhere to this policy, which may include dismissal.
- Eradication programs should target the specific species of *Anopheles* mosquitoes present in the project or camp area. Some species prefer to breed very near human habitations while others preferentially select the shorelines of streams, lakes or ditches.
 - Arrange for indoor residual spraying of sleeping quarters and office areas using insecticide, which can also be used for treating clothing and bed nets.
 - Fogging with insecticide: Carry out fogging surrounding quarters and office areas including under buildings, on walls and on roofs – wherever mosquitoes may rest when they are not active. Carry out fogging with insecticide on the camp margins up to 100 m from camp structures. Fogging is best carried out early or late in the day when air is cooler and wind velocity is low.
 - Cut back vegetation and/or jungle forest to eliminate resting and breeding places for mosquitoes. The local species of *Anopheles* mosquitoes present will help determine the appropriate distance for clearance.

Symptoms of malaria

While malaria can be treated effectively in its early stages, a delay in seeking treatment can have serious or even fatal consequences if you are infected with *P. falciparum*. Be vigilant for symptoms of malaria and seek medical help as soon as possible if you become ill, especially with fever. Assume the fever is a symptom of malaria until proven otherwise. Symptoms are non-specific and it is easy to misdiagnose.

You must seek urgent medical attention if you have these symptoms:

- Sudden high fever accompanied by sweating and chills. The fever may be continuous or paroxysmal (episodic).
- Headache, diarrhea, fatigue and muscle aches
- Loss of appetite, nausea, vomiting
- Severe illness with unrelenting headache, mental confusion, fever and prostration calls for immediate evacuation to a treatment facility. With *P. falciparum* malaria, cerebral infection accompanied by seizures and coma is not uncommon and can be fatal. Progression may be very rapid from the onset of symptoms to death from severe complications – only 36-48 hours in some cases.
- Symptoms of malaria can begin as soon as one week after exposure. They may, however, take many weeks or even months to become evident. On rare occasions, the disease takes years to develop.

Diagnosis of malaria

Malaria can be difficult to diagnose as the symptoms are non specific. Some potentially serious diseases mimic malaria. When identified early and treated with appropriate drugs, almost all malaria can be completely cured. However, if diagnosis is not prompt, it can be much more difficult to treat successfully.

Should you become ill after you return from a malarious area – even if up to 3 months later – be sure to mention your destination(s) to your doctor and request testing for malaria, which requires thick and thin blood smears. If you become ill in the place where you have acquired malaria, the doctors will be familiar with the symptoms and diagnostic procedures.

- The incubation period is usually 1 month. Depending on the form, it can be as short as 5 days or as long as 2 years.
- Malaria can be confused with meningitis, typhoid fever, dengue fever, hepatitis and gastroenteritis.
- A blood test (smear) is required for diagnosis. Stop all prophylaxis medication. Try to obtain a smear within 24 hours of the onset of symptoms. Have a technician or doctor make thick and thin blood smears and repeat testing twice if the first smears are negative (after 12 and 24 hours). If you are returning to Canada or a home country where malaria is not present, bring one set of blood smears home with you and give them to an infectious disease specialist in your home country along with the following information:
 1. Your status (state of health) and location
 2. Diagnosis – type of malaria as derived from the smear
 3. What you are taking for treatment
 4. What you were taking for prophylaxis
- *P. vivax* and *P. ovale* can live for years in the liver and not be affected by most anti-malarial drugs. Extra treatment is required if you contract either of these forms of malaria.
- Always consider the possibility of malaria if you experience fever and flu-like symptoms for *at least* 3 months after leaving a malarious area. Seek medical attention immediately.
- There are no folk diagnostic tools or remedies that work.

Areas of concern

Refer to the CDC and WHO interactive maps for information regarding the risk of malaria in a selected city or country:

<http://www.cdc.gov/malaria/map/>

<http://apps.who.int/tools/geoserver/www/ith/index.html>

Additional information regarding malaria is available on the following websites:

Canadian Recommendations for the Prevention and Treatment of Malaria Among International Travellers: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/04vol30/30s1/index.html>

Comprehensive information about malaria, prevention techniques and drugs: http://www.iamat.org/pdf/protect_yourself_against_malaria.pdf

Map of the geographic distribution of malaria: http://www.cdc.gov/malaria/distribution_epi/distribution.htm

World Health Organization (WHO) home page for the International travel and health 2009 edition report; links to an interactive map for malaria and yellow fever and a downloadable chapter on malaria: <http://www.who.int/ith/en/>

Vector distribution and life cycle of the *Anopheles* mosquito: <http://www.cdc.gov/malaria/biology/mosquito/index.htm>

Frequently asked questions: http://www.phac-aspc.gc.ca/media/advisories_avis/mal_faq-eng.php

12.8.5.10 Meningococcal Meningitis

Description

This acute bacterial infection causes an inflammation of the linings of the brain and spinal cord. If untreated, it is usually fatal. It spreads directly between people by coughing, sneezing and contact with nasal secretions. It usually affects children and young adults. The incubation period is only 2 or 3 days to 1 week. *Urgent medical treatment is required* as 10% of victims die – even with immediate and optimal medical treatment.

Symptoms

- Seek urgent medical treatment, as symptoms progress swiftly.
- Sudden high fever, chills, stiff neck, aversion to light, nausea and vomiting
- Mental confusion and drowsiness within 24-48 hours
- Convulsions, coma and death

Prevention

- Consult a travel medicine physician regarding possible immunization. Vaccines are available, but it is necessary to use the correct type. Consider the risks: destination, time of year, length of stay, nature of your work, your age and health.

Areas of concern: Sub-Saharan Africa (known as the African Meningitis Belt), Indian subcontinent, Arabian Peninsula, parts of South America and Southeast Asia

Additional information regarding meningococcal meningitis:

<http://www.phac-aspc.gc.ca/tmp-pmv/info/meningitis-eng.php>

<http://www.who.int/mediacentre/factsheets/fs141/en/>

<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/meningococcal-disease.aspx>

12.8.5.11 Plague

Description

Bubonic plague is transmitted to humans through bites of infected fleas, usually via rodents or rabbits. The pneumonic form of plague may be transmitted directly from an infected person by coughing. If there is any suspicion that someone has contracted plague, immediate *full medical treatment* is essential because plague can be fatal.

Symptoms

- The onset is 1 to 5 days after exposure.
- High fever, chills, severe headache, prostration and shock develop.
- Black or purple spots (hemorrhages) form under the skin.
- Lymph node swellings develop (buboes) that will drain pus.

Prevention

- Avoid exposure to fleas.
- Use insect repellent on your skin and permethrin-treated clothing.
- Spray your quarters with knockdown sprays containing permethrin.
- Rodent-proof the project living quarters. Handle all dead rodents with gloves and use a spade when carrying them for disposal.
- Do not keep pets that can potentially carry fleas at a project or camp.

Areas of concern: Africa and Asia, western North America, rural areas of South America

Additional information regarding plague:

<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-5/plague.aspx>

<http://www.cdc.gov/ncidod/dvbid/plague/>

12.8.5.12 Rabies

Description

Another name for rabies is hydrophobia.

Rabies occurs throughout most of the world. It is a particularly serious problem in many developing countries because there are few vaccination and control programs for dogs. There, one should regard any bite received from mammals as potentially lethal (e.g., dogs, cats, bats, monkeys, jackals, mongooses etc.). In North America, rabies is carried by a variety of wild animals: bats, raccoons, skunks, foxes, coyotes and wolves etc. Rabies is a deadly disease so you should not risk receiving bites from feral and wild animals anywhere in the world.

Transmission

In addition to transmission by bites, rabies may be transmitted by the lick of an infected animal on an open wound or eating incompletely cooked meat of an infected animal.

If you are bitten:

- Wash the wound immediately with lots of soap and water or alcohol. You can even use spirits, if necessary.
- Next: Wash with povidone-iodine to reduce the numbers of bacteria.
- If possible, have someone isolate the attacking animal (catch and kill, if necessary). It should be tested for rabies.
- Arrange for immunotherapy as soon as possible, if it cannot be proven without a doubt that the attacking animal was free of rabies. Do not wait for symptoms of rabies to appear; it will be too late and the victim will die from the disease.

Prevention

- Avoid stray animals, especially dogs.
- Never befriend wild mammals, especially monkeys. This is particularly important advice for children who are attracted to animals.
- Eat only well cooked meat.
- People should consider pre-exposure injections of rabies vaccine before they move for a prolonged period to an area with a high incidence of rabies. If bitten, these injections simplify (but do not replace) the need for additional treatment. Discuss this option with a travel medicine advisor.

Areas of concern: Central and South America, India, most of Africa, all of Asia and Southeast Asia

Additional information regarding rabies: <http://www.ccohs.ca/oshanswers/diseases/rabies.html>

12.8.5.13 Schistosomiasis

Description

Another name for this is Bilharzia.

In many tropical and subtropical regions, the freshwater streams, lakes, ponds and ditches are contaminated with worm-like parasites that cause schistosomiasis. Do not drink, bathe, swim or wade in these waters. If you inadvertently become exposed, dry yourself off vigorously with a towel and apply rubbing alcohol to the affected parts of your body as soon as possible. This may help prevent an infection.

Symptoms

- A prickly rash or “swimmer’s itch” develops when the parasites enter the skin.
- Additional symptoms may develop four to six weeks later, which include high fever, rash, abdominal pain and swelling, fatigue, weight loss, muscle aches, cough, and perhaps bloody diarrhea.
- In chronic schistosomiasis involving the urinary tract, painless haematuria (blood in urine) occurs.

Prevention

- Avoid contact with contaminated water.
- Chlorinated water and sea water are safe for swimming.
- Bath water is safe if you heat it above 50°C or 122°F for more than 5 minutes, or if it stands in a secure container for more than 48 hours.
- Drinking water must be boiled for at least one minute or filtered, as iodine treatment alone is not effective enough to kill the parasites.

Areas of concerns: Most African countries, Southeast Asia, tropical South America, Egypt, Puerto Rico and some Caribbean Islands including Antigua, Guadeloupe, Martinique, Montserrat and Saint Lucia. The prevalence is changing so review information, as necessary.

Additional information regarding schistosomiasis:

<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-5/schistosomiasis.aspx>

http://www.cdc.gov/ncidod/dpd/parasites/Schistosomiasis/factsht_schistosomiasis.htm

12.8.5.14 Travellers’ Diarrhea

Description

Travellers’ diarrhea is a common and uncomfortable problem. It is caused by eating food or drinking water that has been contaminated with microorganisms. Almost always, the illness only lasts for a couple of days. It may be caused by a variety of bacteria, viruses or parasites. The information in this section should help minimize the risks of developing traveller’s diarrhea and provides advice should you develop this problem.

Symptoms

Diarrhea usually starts suddenly with stomach cramps, frequent loose watery stools, feeling tired or weak, and sometimes vomiting. Most cases resolve within 2 to 3 days without treatment. There are, however, two important points to adhere to: (1) maintain or increase your fluid intake and (2) restrict your food intake immediately. Avoid fatty foods, milk or dairy products, rich or spicy foods and seasoned meat while you have diarrhea. Dry biscuits and bread can be eaten. Avoid alcohol; it will dehydrate you and could irritate your bowel.

For relief, take two tablets of Pepto-Bismol every 30 minutes for up to 8 hours. If diarrhea is severe, it may be necessary to drink some oral rehydration salts. These come pre-packaged to which you add water, or you can make your own from commonly available ingredients (see section 12.8.3.5 Fluid Replacement Therapy).

Medications

Imodium, Lomotil or Codeine Phosphate should not be taken to treat traveller's diarrhea. These medications stop the peristalsis within the bowel which results in an increased growth of the bacteria and the toxic levels within the bowels. This in turn can result in ulceration and perforation of the bowel and lead to death.

Antibiotics may be used to treat diarrhea that persists after 2 or 3 days. Ciprofloxacin, Levofloxacin, or Norfloxacin are the preferred antibiotics for initial treatment. Zithromax (Azithromycin, Z-pack) may also be used to treat travelers diarrhea in developing countries. This antibiotic treats additional bacterial infections that Cipro does not. Obtain medical advice if diarrhea persists longer than 5 days.

Seek urgent medical attention in the following circumstances:

- If blood or mucous appears in your stool
- If you develop a high fever
- If stomach/abdominal pain is severe and persists beyond 8 hours
- If diarrhea continues beyond 5 days

Prevention

The following simple precautions greatly reduce the risk of contracting travellers' diarrhea:

1. Always wash hands thoroughly after using the toilet and before eating.
2. Never drink tap water unless it is first boiled or purified. (Keep iodine solution in your medical kit for this purpose.)
3. Use bottled water or other pre-packaged drinks (e.g., bottles or cans of soft drinks, hot drinks such as tea and coffee).
4. Refuse ice in drinks, as it may have been made with contaminated water.
5. Avoid salads and uncooked fresh vegetables.
6. Always peel fruit (or wash it thoroughly in purified water).
7. Choose restaurants where the staff, surroundings and food appear clean.
8. Choose restaurants where plenty of people are eating, as news of a source of illness usually results in less patronage.
9. Ask for lukewarm food to be replaced with fresh, hot food (including rice).
10. Never eat raw seafood.
11. Avoid unpasteurized milk and dairy products.

Additional information regarding travellers' diarrhea:

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/01pdf/acs27-3.pdf>

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98vol24/24sup/acs1.html>

<http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/travelers-diarrhea.aspx>

12.8.5.15 Typhoid

Description

Typhoid fever is a serious, sometimes life-threatening disease caused by *Salmonella typhi* bacteria. It is spread by consuming food and/or water that have been contaminated by feces or urine from patients or carriers. Food handlers often spread typhoid. All employees should be vaccinated before they travel to risky areas. As the vaccine is only 50-55% effective, you still need to be careful of what you eat and drink.

Symptoms

- Symptoms usually develop between 1 to 3 weeks after exposure.
- Fever, severe headache, loss of appetite and occasionally, rash.

Prevention

- Be immunized and be careful what you eat and drink.
- Do not eat raw salads and leafy vegetables. In some countries, farmers frequently use night soil (human excrement) for fertilizer.
- Peel your own fruits and eat well cooked foods that are served hot.
- Avoid shellfish, especially when they are raw or undercooked. They may have been gathered from sewage-contaminated beds.
- Avoid creamy foods like mayonnaise, whipping cream and custards that contain milk products and eggs. These products are easily contaminated.
- Drink only boiled, bottled, treated water or other safe beverages.

Areas of concern: Africa, Central and South America, most of Asia

Additional information regarding typhoid:

<http://www.phac-aspc.gc.ca/im/vpd-mev/typhoid-eng.php>

12.8.5.16 Yellow Fever

Description

Yellow fever is an acute viral infection transmitted by the bite of infected mosquitoes, mainly by the *Aedes aegypti* and *Haemagogus* species, which are day biting mosquitoes. Yellow fever is characterized by a short incubation period of less than 6 days, high fever and hemorrhagic features causing internal bleeding, jaundice and organ failure. The fatality rate may be up to 30% in unvaccinated people. Vaccination is recommended for all visitors to yellow fever endemic zones in Africa and South America.

Many countries require travellers to show proof of vaccination when in transit within the yellow fever endemic zones or from infected areas or infected countries. If you are unable to show proof, there is the risk being quarantined or vaccinated by local authorities who may use contaminated needles and/or syringes – always carry your vaccination card.

Prevention

- Be immunized.

- Inoculations must be administered in an approved vaccination centre. A single dose protects for 10 years. When vaccinated the first time, your certificate for border crossings becomes valid 10 days after your injection. For revaccination, the certificate is valid immediately if you were vaccinated within the past 10 years.

Observe universal precautions to prevent mosquito bites:

- Stay in air conditioned and/or well-screened quarters.
- Wear long sleeved shirts, long pants and shoes with sock (not sandals).
- Use insect repellents containing DEET on skin.
- Use permethrin sprays on clothing.
- In rural areas use mosquito nets and knockdown sprays.

Areas of concern

The following website lists countries with a risk of yellow fever transmission and countries requiring a yellow fever vaccination to enter or when in transit between countries where yellow fever occurs. <http://www.who.int/ith/ITH2009Countrylist.pdf>

Additional information regarding yellow fever:

General information: <http://www.phac-aspc.gc.ca/tmp-pmv/info/yf-fj-eng.php>

Maps indicating where yellow fever occurs:
<http://www.cdc.gov/ncidod/dvbid/yellowfever/index.html>

World Health Organization (WHO) home page for the International travel and health 2009 edition report. The site has links to an interactive map, a disease distribution map and information on yellow fever: <http://www.who.int/ith/en/>

12.9 Resources

The Prospectors & Developers Association of Canada (PDAC) thanks the following for granting permission to include material from their publications.

Association for Mineral Exploration British Columbia (AME BC)

Their permission does not imply that they endorse the PDAC Health and Safety Guidelines. The PDAC is solely responsible for the content of these Health and Safety Guidelines.

Books

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Products

The Prospectors & Developers Association of Canada does not endorse any product mentioned in this document. The information is intended only to provide a place for companies to begin research for their own requirements. The links provide information on:

Ear Planes:

http://hocks.com/Merchant5/merchant.mvc?Screen=PROD&Product_Code=A052589&gdftrk=gdfV2160_a_7c199_a_7c468_a_7cA052589

Door stop alarm: <http://www.preventsecurity.com/category.asp?sub=85>

Smoke hoods: http://www.homeemergencyusa.com/Peace-of-Mind-Evacuation-Hood--20-Minutes-of-Safe-Breathing_3_84_detail.html

Water purifying cups: http://www.atlantispurewater.com/index_files/page0001.html