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Medical Force Protection: Canada

Medical Force Protection countermeasures required before, during, and after deployment to the "area" are as follows:

Major Threats

Iceland is a highly developed country with health and environmental conditions similar to those of the United States. The medical threat is very low, and no special precautions are needed for the typical traveler or port visitor. Force Protection measures similar to those in typical CONUS field operations will suffice.

Requirements before Deployment

1. **Before Deploying report to Medical to:**
   a. Ensure your Immunizations are up to date, specific immunizations needed for area: **Hepatitis A, MMR, Polio, Typhoid, Yellow fever, Tetanus (Td), and Influenza.**
2. **Get HIV testing if not done in the past 12 months.**
3. **Make sure you have or are issued from unit supply: DEET, permethrin, bednets/poles, sunscreen and lip balm. Treat utility uniform and bednet with permethrin.**

Requirements during Deployment

1. Consume food, water, and ice only from US-approved sources; **"Boil it, cook it, peel it, or forget it"**.
2. Involve preventive medicine personnel with troop campsite selection.
3. Practice good personal hygiene, hand-washing, and waste disposal.
4. Avoid sexual contact. If sexually active, use condoms.
5. Use DEET and other personal protective measures against insects and other arthropod-borne diseases. Personal protective measures include but are not limited to proper wear of uniform, use of bed nets, and daily "buddy checks" in tick and mite infested areas.
6. Minimize non-battle injuries by ensuring safety measures are followed. Precautions include hearing and eye protection, enough water consumption, suitable work/rest cycles, acclimatization to environment and stress management.
7. Eliminate food/waste sources that attract pests in living areas.
8. Avoid contact with animals and hazardous plants.

Requirements after Deployment

1. Receive preventive medicine debriefing after deployment.
2. Seek medical care immediately if ill, especially with fever.
3. Get HIV and PPD testing as required by your medical department or Task Force Surgeon.

CANADA - VECTOR RISK ASSESSMENT
PROFILE (VECTRAP)

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1. GEOGRAPHY:

Canada, the second largest nation on earth in area, is 9,970,000 sq. km (3,800,000-sq mi.). Due to it's extremely cold winter climate, only 31,006,347 people live in Canada (1999), slightly less than the number of people living in California, and most of them within 200 miles of the border with the U.S. The climate is temperate to arctic. The eastern half of the country is heavily forested, many areas having rolling hills. Prairies occupy much of the central country, which farmed extensively. The West Coast is mountainous with a few islands. The north is mostly flat, frozen tundra. The Northwest Territory and Yukon occupy 1.45-million sq. mi. and only have 72,300 people between them. English and French (Quebec) are the two spoken languages of Canada.

2. VECTOR-BORNE DISEASES:

a. MALARIA: Several hundred imported cases are reported each year. Infections have been acquired out of the country by travelers to malarious countries. Plasmodium vivax has been the predominant species diagnosed. Although vector transmission is possible, indigenous malaria has not been documented in Canada since the early 1900's.

b. MOSQUITO-BORNE ENCEPHALITIS: Western Equine (WEE) and St. Louis Encephalitis (SLE) and the California group (CA) encephalitis viruses are present in Canada. Occurrence is sporadic and generally found in the southern one-third of the country. If acquired, this disease would severely impair combat readiness.

c. TICK-BORNE ENCEPHALITIS OR POWASSAN ENCEPHALITIS: This tick-borne virus is found mainly in the northern Great Lakes region of Canada. Clinical cases have been mostly restricted to the Ontario and Quebec regions. Risk of contracting this disease is low. If acquired, this disease would impair combat readiness.

d. LYME DISEASE: Indigenous cases of this particular spirochete of Borrelia remain very rare in Canada. The potential exists for this disease to occur more often because of the presence of the tick vectors. Seven cases were reported during 1989. Reservoirs for the infection (rodents) have been detected in Ontario, which is now endemic along with Quebec, New Brunswick and Manitoba. The disease also occurs in British Columbia and Alberta. Risk is greatest during the summer months. The acute phase of this disease could impair combat effectiveness.

f. ANIMAL ASSOCIATED DISEASES: Approximately 2,500 cases of animal rabies were reported in 1986. Rabies is endemic throughout most of Canada with the Ontario region having the highest incidence. Human rabies has been rare in Canada.

3. DISEASE VECTOR INFORMATION:

a. MALARIA: Although this is not an endemic disease, Anopheles mosquitoes are present and capable of vectoring the infection. Three species of importance include Anopheles freeborni, found in S.W. Canada; Anopheles punctipennis, throughout the southern portion of the country; and Anopheles earlei, the species with the most northerly distribution of the three.

Anopheles freeborni: Larvae are found in clear seepage water in sunlit roadside pools and rice fields. Heavy production of larvae is often associated with matted algal growths in water along the margins of pools. Females are active biters at night and will readily enter houses to feed on man. They are known to have a flight range of greater than 10 miles.

Anopheles punctipennis: Larvae seem to prefer cool, clean water, and are found in a wide variety of aquatic habitats from ponds and puddles to some artificial containers. This mosquito will readily feed on man and is generally regarded as an exophilic species.

Anopheles earlei: Larvae prefer cold, clear water in shallow margins of ponds, which are overgrown with emergent of floating vegetation. Adults feed primarily in the early evening hours and will readily enter houses to secure a blood meal.

b. MOSQUITO-BORNE ENCEPHALITIS: WEE and SLE is vectored by Culex tarsalis. Culex tarsalis is most often associated with agricultural usage of water, in both coastal and valley areas in S.W. Canada. This species will readily bite man and birds at night. Various species of birds function as natural reservoirs for both WEE and SLE viruses.

As in the U.S., Aedes triseriatus is an important vector of several CA group viruses, including LaCrosse. This species is a common tree hole- breeding mosquito. The larvae develop in water filled holes in various deciduous trees and in artificial containers such as barrels and tires. Larvae can be found from May to September throughout most of its northern range. The adults are crepuscular and fly mostly during the early morning and evening hours. They can be serious pests in residential areas in or near woodlands and are persistent biters.

c. TICK-BORNE ENCEPHALITIS OR POWASSAN ENCEPHALITIS: The two primary vectors for this virus infection are Ixodes cookei and I. marxi. Ground hogs and squirrels and these two hard tick parasites constitute the main reservoirs for the virus. Humans seldom enter the disease picture because the ticks normally involved rarely bite man.

d. LYME DISEASE: The two primary vectors in North America are Ixodes dammini and I. pacificus, both hard ticks. Other ticks and biting flies may transmit the disease as well. Natural infections have been found in Dermacentor variabilis, the dog tick. Ixodes dammini occurs in grassy and wooded areas. Specimens of Ixodes dammini, a vector of Lyme disease, have been collected in Manitoba. Although cases of Lyme disease have been reported from Manitoba, I. dammini previously had been detected only in southwestern Ontario. Nymphs feed during the summer on mice or larger mammals such as dogs, deer or humans before molting to adults in the fall. Ixodes pacificus, the western blacklegged tick, is restricted to the pacific coastal

region (B.C.). It prefers cool, moist climates and is most active from December through June. Nymphs and adults prefer to feed on large mammals, especially deer.

e. ANIMAL ASSOCIATED DISEASES: Animal rabies is endemic in many parts of Canada. Wild animals, especially foxes and skunks, account for the majority of the cases.

4. DISEASE VECTOR CONTROL PROGRAMS:

a. Prevention and Control: The conscientious use of personal protective measures will help to reduce the risk of many vector-borne diseases. Protection from mosquitoes and other biting flies can be accomplished by the use of screened eating and sleeping quarters (insect bar NSN 7210-00-266-9736) and by limiting the amount of outside activity during the evening/night hours whenever possible. If necessary, space spray with d-Phenothrin (NSN 6840-01-412-4634) within quarters.

Personal protective measures should be initiated at sundown in the prevention of malaria, JE and filariasis. Keeping the body covered, such as rolling shirtsleeves down, will deter mosquito biting. The use of DEET 33% lotion (2 oz. tubes: NSN 6840-01-284-3982) or DEET 75% repellent (2 oz. bottles: NSN 6840-00-753-4963) during daylight and evening/night hours is recommended for protection against mosquitoes, sand flies, other biting flies and also against mites and fleas. Additional protection can be achieved through the use of DEET jackets (NSN 8415- 01-035- 0846 =Sm. 0847 =Med. 0848 =Lrg.) and through the use of 0.5% Permethrin aerosol clothing repellent (NSN 6840-01-278-1336). Chemical control of vectors may be necessary in areas where avoidance is impractical.

Avoid tick-infested areas when feasible. Using a buddy system, search total body area every 3-4 hours for attached ticks. Prompt removal of ticks may prevent potential disease transmission. DEET or permethrin aerosol spray may be used as a tick and mite repellent when applied to clothing. The blousing of trouser legs will deter tick biting.

The most important element of a vector control program involving Aedes aegypti is SOURCE REDUCTION. The number of mosquitoes will be greatly reduced by the elimination of all water holding containers in areas close to human habitation. Tin cans, tires, broken pottery, plant vases and similar items must be emptied weekly, be eliminated or stored as to prevent further mosquito breeding. Sand or mortar can be used to fill tree holes and rock holes found near encampments. In areas where it is necessary to store water for drinking, ensure the container has a tight fitting lid or apply Temephos (Abate) larvicide at 1 ppm.

Rodent control should be implemented only after satisfactory flea or mite control has been accomplished.

Filth fly control should be considered a priority to prevent outbreaks of enteric infections such as shigellosis. Flytek® and/or Apache® fly baits (NSN 6840-01-183-7244) may be considered for use.

Recommended pesticides, by vector group, can be found in Technical Information Memorandum # 24, Contingency Pest Management Pocket Guide, Armed Forces Pest Management Board, Walter Reed Army Medical Center, Washington, D.C. 20307-5001.

Important References:

Contingency Pest Management Pocket Guide-Fourth Edition. Technical Information Memorandum(TIM)24. Available from the Defense Pest Management Information Analysis Center (DPMIAC) (DSN: 295-7479 COMM: (301) 295-7479). Best source for information on vector control equipment, supplies, and use in contingency situations.

Control of Communicable Diseases Manual-Edited by A. S. Benenson. Sixteenth Ed. 1995. Available to government agencies through the Government Printing Office. Published by the American Public Health Association. Excellent source of information on communicable diseases.

Medical Environmental Disease Intelligence and Countermeasures-MEDIC). September 1997. Available on CD-ROM from Armed Forces Medical Intelligence Center, Fort Detrick, Frederick, MD 21702-5004. A comprehensive medical intelligence product that includes portions of the references listed above and a wealth of additional preventive medicine information.

Internet Sites- Additional information regarding the current status of vector-borne diseases in this and other countries may be found by subscribing to various medical information sites on the internet. At the Centers of Disease Control and Prevention home page subscriptions can be made to the Morbidity and Mortality Weekly Report(MMWR)and the Journal of Emerging Infectious Diseases. The address is www.cdc.gov. The World Health Organization Weekly Epidemiology Report (WHO-WER) can be subscribed to at www.who.int/wer. The web site for PROMED is www.promedmail.org:8080/promed/promed.folder.home.
Although PROMED is not peer reviewed, it is timely and contains potentially useful information. The CDC and WHO reports are peer reviewed. Information on venomous arthropods such as scorpions and spiders as well as snakes, fish and other land animals can be found at the International Venom and Toxin Database website at www.uq.edu.au/~ddbfry/. Information on anti-venom sources can also be found at that site. Information on Poisonings, Bites and Envenomization as well as poison control resources can be found at www.invivo.net/bg/poison2.html.