

# Deployment Health and Family Readiness Library



## Permethrin-Impregnated Clothing

*For Service members and their Families*

### Important Facts

- By wearing clothing impregnated with permethrin and using DEET insect repellent on all exposed skin, you will be well-protected from many biting insects. Permethrin-impregnated clothing and permethrin-treated bed nets are critical to keeping deployed U.S. Service members healthy.
- Permethrin-impregnated clothing is safe to wear and will keep away sand fleas, mosquitoes, and other insects that transmit illnesses such as malaria, leishmaniasis, dengue, West Nile encephalitis, and scrub typhus.
- Permethrin-impregnated clothing will continue to keep away biting insects after repeated laundering. However, do not dry clean treated uniforms; it removes permethrin from clothing.
- To avoid adverse health reactions, do not treat underwear or caps/hats. Do not allow permethrin to contact your face or eyes and try not to breathe in spray vapors. Wear rubber gloves when handling wet, treated uniforms and when mixing permethrin solutions. Permethrin can be very toxic to fish and aquatic organisms; do not let excess permethrin contaminate local water sources.

### What is permethrin and how is it used?

Permethrin is both an insect repellent and a pesticide (insecticide). When it is applied to clothing and bed nets, it offers reliable protection against a wide range of disease-transmitting insects, such as mosquitoes, human body lice, tsetse flies, sand fleas, and ticks, including those that transmit Lyme disease. It is also used under a health care provider's prescription to get rid of parasites such as head lice and scabies, and in industry and domestic settings to control pests such as ants and termites. It is commonly used by hunters on their clothing. Although highly toxic to insects, it is one of the least toxic insecticides to people. Permethrin is the only approved, long-lasting pesticide repellent for use on military uniforms.



### How are uniforms impregnated with permethrin?

There are two methods to impregnate uniforms with permethrin: individual treatment kits or sprays, and at a factory prior to uniforms being issued or purchased. When permethrin is applied using kits or spray cans, the uniforms must be allowed to dry completely before wearing. Do not directly apply permethrin to skin.

### Are factory-treated uniforms preferred over uniforms treated individually with kits or sprays?

Uniforms treated with permethrin in factories are preferred to individual treatment. Factory-treatment is the most efficient and fastest method of uniform treatment. Tests show factory-treated uniforms may provide protection for up to 50 launderings, but treating uniforms with permethrin sprays or kits only will be effective for 5 or 6 launderings. When permethrin is applied before the uniform is purchased or issued, it reduces the risk of Service members being exposed by breathing vapors or coming in contact with skin. Following individual treatment, make sure uniforms dry completely before wearing them.

### Are permethrin-impregnated uniforms safe?

Permethrin-impregnated uniforms are safe to wear and protect against more than 60 diseases spread by insects. Both the Commandant of the U.S. Marine Corps and the Surgeon General of the U.S. Army have officially approved the safety and protective necessity of factory permethrin-treated uniforms.

A small number of Service members have experienced adverse reactions, such as short term mild rashes or sensations of warm skin. To avoid such reactions, do not treat underwear or caps/hats. Avoid permethrin contact with face and eyes and try not to breathe in spray vapors. Wear rubber gloves when handling wet, treated uniforms and when mixing permethrin solutions. Permethrin



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*A collaborative effort between the Air Force Institute for Operational Health, the Deployment Health Clinical Center, Force Health Protection and Readiness, the Navy Environmental Health Center, the U.S. Army Center for Health Promotion and Preventive Medicine, and the OUSD(P&R)/Military Family and Community Policy*

can be very toxic to fish and aquatic organisms; do not let runoff contaminate local water sources.

### Can pregnant women wear permethrin impregnated uniforms?

Available data and experience indicate that permethrin impregnated uniforms are safe for pregnant women to use. Prior to registering a pesticide for use, the U.S. Environmental Protection Agency (EPA) requires extensive test data from pesticide manufacturers that demonstrate pesticide repellents can be used without posing harm to human health and the environment. Additional precautions are not necessary for pregnant women using registered pesticide repellents when insect-borne diseases are a risk. The U.S. Centers for Disease Control and Prevention (CDC) recommends pregnant women who are not staying in a well-screened or air-conditioned area when traveling or residing in regions where disease-carrying insects are present should treat their clothing and bed nets with permethrin. Consult your health care provider if you have questions.

### Besides the military, should other groups use permethrin-impregnated clothing?

Yes. The CDC and the World Health Organization recommend that anyone, including pregnant women and children, traveling in areas where disease-carrying insects are present, use permethrin-containing repellents on clothing, shoes, bed nets, and camping gear to help prevent diseases transmitted by insects.



Permethrin-impregnated clothing is also available for people who may be exposed to biting insects, such as hunters or people who work outdoors. This clothing can be bought from many sporting goods stores and catalogs.

### How should this clothing be laundered?

Factory permethrin-treated uniforms may be machine washed and dried as usual either at home or at a commercial laundry facility. It is safe to wash the permethrin-treated uniforms with other clothing. Permethrin is bound so strongly to most fabrics that detergent and water will not remove it. The treated uniforms may also be starched and pressed. However, **DO NOT** dry clean treated uniforms since that process will remove the permethrin from the garment.

#### More information may be found:

- Armed Forces Pest Management Board, personal protective measures for deployment: <http://www.afpmb.org/coweb/ppm.htm>
- National Research Council, Health Effects of Permethrin-Impregnated Army Battle -Dress Uniforms (1994): <http://books.nap.edu/books/NI000104/html/R1.html>
- CDC recommendations for traveler's health: <http://www.cdc.gov/travel/index.htm>
- U.S. EPA Pesticide Information: <http://www.epa.gov/pesticides/index.htm>
- U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), DoD Insect Repellent System: <http://chppm-www.apgea.army.mil/documents/DoDInsectRepellentSys.pdf>
- DoD Pesticide Hotline: 410-436-5418 or DSN 584-5418

### Where Do I Get More Information?

DoD Deployment Health Clinical Center (DHCC)  
Phone: (866) 559-1627  
<http://www.pdhealth.mil/>

U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM)  
Phone: (800) 222-9698  
<http://chppm-www.apgea.army.mil>

Air Force Institute for Operational Health (AFIOH)  
Phone: (888) 232-3764  
<http://www.brooks.af.mil/afioh/>

DoD Force Health Protection & Readiness (FHP & R)  
Phone: (800) 497-6261  
<http://fhp.osd.mil>

Navy Environmental Health Center (NEHC)  
Phone: (757) 953-0700  
<http://www.nehc.med.navy.mil>



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