Pet Flea and Tick Collar Hazards to Soldiers

FACT SHEET 18-009-0618

Soldiers who wear pet flea and tick collars next to their skin or over their uniforms risk severe skin reactions and other adverse health effects. There is no evidence that wearing pet flea and tick collars in any manner will prevent bites from sand flies, mosquitoes, fleas, or ticks. The safest and most effective protection for Soldiers from biting insects is the DoD Insect Repellent System.

Wearing pet flea and tick collars on skin or over clothing or footwear (red arrow) to repel insects is illegal, ineffective, and unsafe. Photo: VID, APHC

How are pet flea and tick collars misused by Soldiers?

Care packages with pet flea and tick collars are being sent from well-meaning citizens or civilian groups to Soldiers deployed overseas. Soldiers are taking these pet flea and tick collars and wearing them over their clothes, boot, or uniforms, or next to their skin around their wrists, ankles, arms, or belt lines to repel insects. There is no evidence that wearing flea and tick collars in any manner prevents insect bites on Soldiers. Pet flea and tick collars are not registered for human use by either the United States Environmental Protection Agency (USEPA) or the Food and Drug Administration (FDA). It is therefore a violation of federal law for Soldiers to use pet flea and tick collars on themselves.

How could pet flea and tick collars cause illness in Soldiers?

Soldiers may experience severe skin reactions and possible systemic poisoning from wearing pet flea and tick collars. Sweat, which is secreted through pores from glands in the skin, can leach out large amounts of pesticides and other chemical ingredients from pet flea and tick collars. This sudden, massive dose of pesticides can result in direct skin damage, including redness, blistering, chafing, and skin erosion. Pesticides released by pet flea and tick collars can also be absorbed into the body through pores in the skin, causing possible internal damage. Sweat can even draw pesticides from pet flea and tick collars through fabrics, so wearing collars on the outside of pants, socks or boots is not a safe practice.

Large amounts of pesticides are released when pet flea and tick collars get wet, causing severe skin reactions. Photo: VID, APHC

What kinds of pesticides are commonly found in pet flea and tick collars?

Pet flea and tick collars contain a wide variety of pesticides that can be absorbed into the skin in toxic amounts. These pesticides include organophosphates (e.g., tetrachlorvinphos), insect growth regulators (e.g., pyriproxifen), pyrethroids (e.g., deltamethrin), and formamidines (e.g., amitraz). Organophosphate pesticides inhibit acetylcholinesterase, an enzyme critical in controlling nerve impulse transmission in humans. Skin exposure to low levels of these pesticides can result in weakness, headache, and gastrointestinal upsets. More severe skin exposure to organophosphate pesticides may result in respiratory distress, hypertension, convulsions, and coma. Human exposure to formamidine insecticides can result in paleness, dry mouth, drowsiness, disorientation, light-headed feeling, slurred speech, and loss of consciousness.

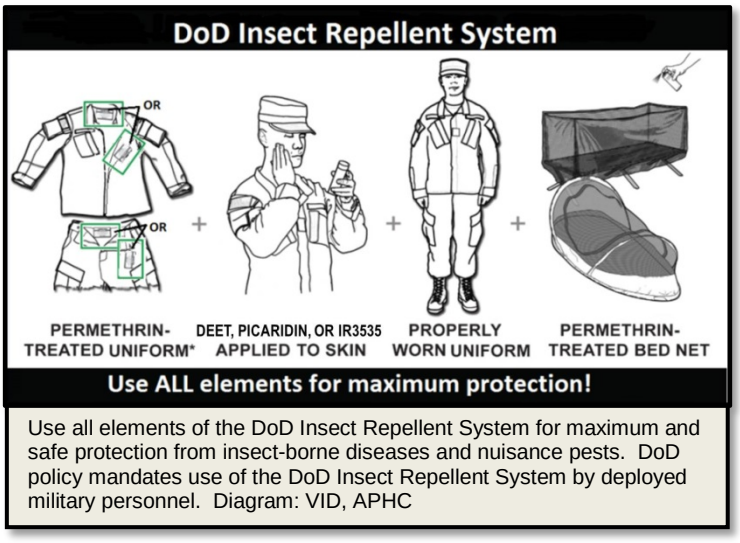
Why are pet flea and tick collars not as hazardous when used on dogs and cats?

Pet flea and tick collars are not as hazardous when used on dogs and cats because these animals do not sweat like humans do. Sebaceous glands in the animals' skin secrete oils that spread small amounts of the pesticides from the collars across the animals' skin. This must happen in order for the collars to work; otherwise, fleas, ticks, or other arthropods would have to directly contact the collar to be repelled, and protection would only occur around the collar.

Army Public Health Center, Entomological Sciences Division
Building 5158, 8252 Blackhawk Road, APG, MD 21010-5403
COM 410-436-3613 / DSN 312-584-3613 / Website: http://phc.amedd.army.mil

What is the best and safest method to protect Soldiers from biting insects?

The best method to protect Soldiers from biting insects is using the DoD Insect Repellent System. It is also the safest way to protect Soldiers from insects and ticks which can transmit diseases such as Zika, West Nile virus, malaria, dengue, leishmaniasis, Lyme disease, and other tick-borne diseases. This system incorporates a properly worn permethrin-treated uniform; DEET, picaridin or IR3535 repellent applied to exposed skin; and sleeping inside a permethrin-treated bed net.



Use all elements of the DoD Insect Repellent System for maximum and safe protection from insect-borne diseases and nuisance pests. DoD policy mandates use of the DoD Insect Repellent System by deployed military personnel. Diagram: VID, APHC

How do I know if my uniform is treated with permethrin?

Army Combat Uniforms factory-treated with permethrin (ACU Permethrin) and the Operational Camouflage Pattern (OCP) uniform will have a sewn-in label in the trousers and coat indicating that the uniform has been factory-treated. If not factory-treated, Soldiers can permanently treat with the IDA kit (NSN 6840-01-345-0237), which can last up to 50 washings, or temporarily treat using the 0.5% aerosol spray can (NSN 6840-01-278-1336), which can be reapplied after 6 weeks and the sixth washing. Never retreat uniforms which have been factory-treated, treated with an IDA kit, or treated using a 2-gallon sprayer. When applying permethrin, always read and follow the label directions. Permanently mark the uniform label with the permethrin treatment date. **NEVER APPLY PERMETHRIN TO THE SKIN!** Civilians can purchase commercially available 0.5% permethrin aerosol products and permethrin factory-treated clothing.

What are the standard military insect repellent products available for use on exposed skin?

Approved military insect repellents for use on exposed skin come in a variety of formulations. Always refer to the label to determine frequency of repellent application based on activity. **Do not apply repellent to eyes, lips, or to sensitive or damaged skin**. Available military repellents are:

- **Cutter® pump spray** (NSN 6840-01-584-8598) contains 25% DEET; one application protects for up to 10 hours.
- **Bullseye™ Bug Repellent pump spray** (NSN 6840-01-656-7707), contains 20% IR3535®; provides protection for up to 8 hours.
- **Natrapel® pump spray** (NSN 6840-01-619-4795) contains 20% picaridin; repels insects and ticks for up to 8 hours.
- **Ultrathon™** (NSN 6840-01-284-3982) contains 34% controlled-release DEET lotion; one application protects for up to 12 hours.
- **Ultra 30™ Insect Repellent Lotion** (NSN 6840-01-584-8393) contains 30% Lipo DEET; one application protects for up to 12 hours.
- **Chigg-Away® lotion** (NSN 6804-01-137-8456) contains 10% precipitated sulfur and 5% benzocaine, repels chiggers.

What is considered a "properly worn" uniform?

Worn properly, the ACU/OCP is a physical barrier against insects, ticks, and other disease vectors and biting nuisance pests. Wear uniforms with the sleeves rolled down; tuck pants into boots and undershirt into pants as illustrated above in the DoD Insect Repellent System. Wear uniform loosely since mosquitoes can bite through fabric that is pulled tight against the skin. A permethrin-treated uniform does not provide protection to exposed skin; protect exposed skin with an approved insect repellent.

What are the standard bed nets available to help protect Soldiers from tick bites while sleeping?

Treated bed nets provide a barrier between a sleeping Soldier and pests (e.g., mosquitoes, ticks). Use lightweight, self-supporting, pop-up bed nets factory-treated with permethrin (coyote brown, NSN 3740-01-518-7310, green camouflage, NSN 3740-01-516-4415) or the Egret bed bet (NSN 3740-01-644-4953). Untreated Mosquito Bed Nets (NSN 7210-00-266-9736) should be treated with the 0.5% permethrin aerosol spray (NSN 6840-01-278-1336) and assembled properly on a cot. Check for holes in the netting and keep loose edges off the ground by tucking them under the sleeping bag.

Use of trademarked name does not imply endorsement by the U.S. Army but is intended only to assist in identification of a specific product.
For more information please consult the APHC website - http://phc.amedd.army.mil