



## Just the Facts...

## Environmental Pesticides - Medical

<b>GENERAL INFORMATION</b>	<p>The term "pesticide" includes insecticides, herbicides, fungicides, rodenticides and disinfectants. A pesticide may be a liquid (mist or spray), solid (dust, granule or bait) or gas (vapor) applied to control unwanted insects, ticks, mites, plants or animals in a given area. While there are many types of pesticides available worldwide, the DoD has limited the military's use of pesticides to only those that are registered with the EPA and then to only those contained on the "DoD Contingency Pesticide List". During a deployment, insecticides and rodenticides will be the most common pesticide product types to be used. Herbicides may be used in certain limited applications. The use the repellents as part of the DoD Arthropod Repellent System and the safe and judicious use of pesticides are fundamental in protecting the military service member from insect and rodent-borne disease. The Department of Defense (DoD) has regulations and policies in place to ensure that pesticides are used in accordance with the product label and applied only by training and certified applicators.</p> <p>Only personnel properly trained in the safe use of pesticides should handle and apply pesticides. All pesticides must be used in accordance with their product label directions.</p>
<b>ROUTINE USES IN THE DEPLOYED SETTING</b>	<p>Insecticides are used in the control of arthropod (insects, ticks, mites) vectors of disease. Rodenticides are used to control mice and rats which also vector disease. In rare instances herbicides may be applied to control unwanted poisonous or noxious vegetation, such as poison ivy or brambles. Preventive Medicine detachments may conduct fogging operations for adult mosquito control and area treatments for tick and mite control in addition to placing baits for rodent and filth fly control. Unit level Field sanitation teams may perform perimeter applications and spot treatments to control crawling insects.</p> <p>Applications may be made using various power equipment mounted on vehicles or even aircraft, by a handheld 2-gallon sprayers, or hand placement of baits.</p>
<b>PERSONAL PROTECTIVE EQUIPMENT (PPE) and COUNTERMEASURES AVAILABLE FOR DEPLOYED PERSONNEL</b>	<p>If possible all unnecessary personnel should be directed to leave the immediate area, while pesticide applications are conducted and not be allowed to return until all surfaces are thoroughly dry. Avoid inhalation of pesticide mists or vapors. Cover or remove all food service equipment and utensils prior to any pesticide application. Protect food and water supplies from coming in contact with pesticides. Educate personnel on how to identify various rodenticides and baits, and instruct them to never tamper with rodent or fly baits.</p>
<b>QUESTIONS TO ASK REGARDING EXPOSURE</b>	<ul style="list-style-type: none"><li>• How frequently did individual come into direct contact with a pesticide, or inhaled pesticide vapors? What was that pesticide and what were they trying to control?</li><li>• Did individual have any acute effects from pesticide exposure: pupil dilation, irritation of skin or eyes, runny nose, excessive sweating, blurred vision, slurred speech, muscle twitching, tightness in chest; cough or difficulty breathing; or loss of consciousness?</li><li>• Does individual have chronic effects that are possibly related to pesticide exposure? What is this relationship?</li></ul>
<b>EXPOSURE LEVELS HISTORICALLY ENCOUNTERED</b>	<p>Pesticide exposures can occur from a very wide range of sources. Not all exposures may be related to applications conducted by US forces. Pesticide residues may be present in the soil, water and on structural surfaces from applications that occurred prior to the arrival of US forces. Historical records concerning agricultural applications may provide valuable information. These data are important in assessing potential solvent exposure.</p>

<p><b>AVAILABLE EXPOSURE DATA</b></p>	<p><b>DATA IF AVAILABLE:</b> Check with the theater surgeon's office to determine what PM units are operating in your area of operations and determine if they have submitted any application records.</p>
<p><b>COMMON ACUTE AND CHRONIC HEALTH EFFECTS</b></p>	<p>Exposure most commonly occurs by inhalation of mist and vapors, smoking contaminated cigarettes (transferred from hands), ingestion of contaminated food and water, or by absorption through the skin. The speed of the appearance of symptoms depends on the method of contact. Inhalation of pesticide mist and vapors produces the most rapid symptoms, followed by ingestion and finally absorption through the skin being the slowest producer of symptoms.</p> <p><u>Acute effects (short-term exposures):</u></p> <p>Most signs are cholinergic in nature. Common signs include dilated pupils, frontal headache, runny nose, tightness in chest and cough. Additional early symptoms which may occur following inhalation or ingestion include excessive sweating, headache, weakness, giddiness, nausea, vomiting, stomach pains, blurred vision, slurred speech, and muscle twitching. Clinical findings vary depending on pesticide type however, disorientation, giddiness, dizziness, and confusion progressing to unconsciousness, paralysis, convulsions, and death from respiratory or cardiovascular arrest can occur. Later there may be convulsions, coma, loss of reflexes and loss of sphincter control.</p> <ul style="list-style-type: none"> <li>• Direct eye contact may produce burning and tearing.</li> <li>• All skin contact with a pesticide should be cleansed immediately, remove contaminated clothing and wash the affected skin with soap and water if available, and flush the area with large quantities of water.</li> </ul> <p><u>Chronic effects (short-term and long-term exposures):</u></p> <ul style="list-style-type: none"> <li>• Persons exposed to organophosphate insecticides (OP) should be protected from re-exposure to cholinesterase-inhibiting pesticides, until all signs and symptoms have resolved.</li> <li>• Persons who have ingested rodenticides may manifest nosebleeds, bleeding gums, hematuria, melena, and extensive ecchymoses. Additional symptoms include anemia, fatigue and dyspnea on exertion.</li> </ul>
<p><b>REVERSIBILITY OF HEALTH EFFECTS</b></p>	<p>After stopping additional exposure, the effects of most pesticides can be reduced or reversed using antidotal therapy. Depending on the type of pesticide exposed, treatment will vary. It is important to attempt to ascertain what pesticide was used and how exposure may have occurred. Pesticide application records are required to be maintained by the applicator.</p> <p>In rare instances of short-term exposures to very high levels, or long term, repeated exposure to moderate or high levels, permanent damage to the nerves can occur.</p>
<p><b>TREATMENT REQUIRED/AVAILABLE FOR TOXIC EFFECTS</b></p>	<p>The immediate treatment for exposure is to stop the exposure when effects occur.</p> <p>Eye contact: immediately rinse the affected eye(s) with water for 15 minutes. The individual should seek medical evaluation immediately after rinsing the affected eye.</p> <p>Skin contact: immediately wash the affected area with soap and water, ensure fingernails, hair and skin folds are thoroughly cleansed, care should be taken to protect healthcare workers from becoming contaminated.</p> <p>Inhalation exposure: Immediate treatment is to stop continued exposure. Move effect personnel to fresh air. Oxygen may be required in more severe exposures, such as exposures resulting in breathing difficulties or loss of consciousness.</p> <p>OP Insecticides: Several antidotal therapies are available for OP poisoning. Atropine, Glycopyrolate, and Pralidoxime are potential choices to antagonize the effects of excessive concentrations of acetylcholine.</p> <p>Rodenticides: Attempt to determine the quantity ingested. For small quantities medical treatment may be unnecessary. For larger doses, Phytonadione (vitamin K1) may be administered to protect against the anticoagulant effects.</p>
<p><b>LONG TERM MEDICAL SURVEILLANCE REQUIREMENTS OF HEALTH EFFECTS MONITORING</b></p>	<p>Depending on the degree of exposure and the pesticide involved, long-term medical monitoring may be indicated.</p>
<p><b>SPECIAL RISK COMMUNICATION ISSUES</b></p>	<p>Most pesticide exposures will be minor or incidental. Personnel at greatest risk are those personnel mixing, handling and applying pesticides. Pesticide applicators should be enrolled in an Occupational Health medical surveillance program at their home station.</p>