

## TOXIC PESTICIDE EXPOSURES

**A**FTER SUFFERING FROM an itchy rash for several weeks, a seasonal nursery worker sought health care. The physician observed an erythematous rash on the patient's trunk, diagnosed allergies, and prescribed antihistamines. No etiology was identified. When the skin condition was almost resolved, the worker mentioned to a community organizer that the dermatitis could be related to pesticides. That person then contacted the Health Division (OHD).

Because the worker wished to work for the same employer in the future, OHD staff took care not to identify the person, while obtaining the product name and use information. The pesticide, Joust™ (oxythioquinox), is known to cause photosensitivity and allergic dermatitis. Safety information was translated for the patient, and OHD staff provided simple instructions for reducing exposure risk when handling pesticides, which the worker agreed to follow. Although no chemical exposure was mentioned at exam—perhaps because of a language barrier—an OHD investigation report was sent to the physician along with product information.

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Spring has sprung, and with it the weeds and insects that impel many gardeners, farmers, homeowners and nursery owners to the use of a chemical stew in an effort to control Mother Nature. Some people will get more than they bargained for. The Health Division (OHD) has a program that offers health care providers and their patients assistance in the diagnosis, treatment, and prevention of pesticide poisoning.

Pesticide poisoning (confirmed or even suspected) is one of two environmental conditions reportable in Oregon. (The other is lead poisoning.) Many physicians are unaware that reporting is required by law or that help is available, and with this article we hope to set you straight. Pesticide poisoning can be difficult to diagnose, with a wide variety of insecticides,

herbicides, fungicides, and other products of varying toxicity presenting a range of health effects. Symptoms may mimic more common conditions (see table). In order to identify pesticide-related illness, a thorough patient history is often necessary.

Pesticide exposure has not been clearly linked with chronic health problems in the peer-reviewed toxicologic literature. No pesticides in current use are known human teratogens or reproductive toxins. Some insecticides, fungicides and herbicides are suspected human carcinogens, but it has not been possible to definitively link human cancers to pesticide exposure.

In 1997, more than 100 people were reportedly exposed to pesticides in 69 incidents throughout Oregon. Only 22 of those incidents were work-related, in contrast to 1996, when almost half occurred on the job (with about the same numbers of incidents and exposures). Of the 49 people reporting exposure at work, 14 worked in agriculture and 12 in health care (the latter all treated a patient who had ingested pesticides). From comparing these reports to workers' compensation claims data, we know that many suspected work exposures are not reported. Of the 55 non-occupational cases in 1996, 84% occurred in or around the home.

### OHD ASSISTANCE

There are several ways that medical professionals can receive timely help when pesticide poisoning is suspected.

For emergency treatment advice, the Oregon Poison Center (OPC) is available around the clock. OPC also provides information on biomarkers and case management services. Call OPC at 800/452-7165, or, in the Portland metro area, 503/494-8968.

The Environmental Protection Agency funds a toll-free telephone service (the National Pesticide Telecommunications Network [NPTN], 800/858-7378) to quickly provide information about pesticide product ingredients and toxicology. One of NPTN's key resources for health care

providers is Oregon toxicologist Sheldon Wagner, MD, who provides consultation regarding diagnosis, treatment issues, and biological tests.

OHD staff work with providers and patients to gather and evaluate information about suspected exposures. Our industrial hygienists help identify pesticide products, provide data about known health effects, and, in selected cases, collect environmental samples and evaluate exposure circumstances. Other potential environmental exposures that may cause symptoms (e.g., molds) are sometimes identified. To make a confidential report, call the OHD at 503/731-4025.

One of our most important services is helping patients avoid future problems with pesticides. We advise people about how to clean up spills safely, find information about alternatives to toxic chemicals, and recommend appropriate personal protection and safe work practices to those who use pesticides. For more information and referrals, call the OHD.

*Case 2.* Within three days of moving into a rental home, a child developed reactive airway symptoms, which worsened despite treatment. The parents learned that the home had been treated with diazinon 10 days before they had moved in. OHD staff worked with the physician and the landowner to ensure appropriate environmental testing and a thorough cleanup. The investigation also revealed significant mold levels, a common confounder in indoor pesticide poisoning cases. The child's condition improved significantly within two days of moving from the home.

### PATIENT/ENVIRONMENTAL TESTING

The sooner we are contacted, the more help we can provide you and your patients. Many pesticides break down quickly. Delays in obtaining blood or urine samples may preclude a definitive diagnosis. Biomarkers for the pesticide's parent compound or metabolites exist for many pesticides. In cases of severe acute organophosphate poisoning, where atropine or pralidoxime ("2-Pam") will be used, samples need to be

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collected before treatment. Cholinesterase levels (plasma or RBC) are an organophosphate biomarker. Due to individual variation, a follow-up test may determine the extent of cholinesterase inhibition. While testing may not be necessary for treatment of an acute illness, it may identify a potential on-going health hazard.

All biologic samples must be collected as soon as possible, generally within 2–24 hours of exposure. Samples may need to be drawn before you have decided whether analysis is warranted or even before a pesticide product is identified. OHD staff can assist you in gathering such information and provide advice on testing. And don't forget—if a patient was just exposed, skin wipes and clothing sampling for proving exposure are available—call us for details.

It is also important to remember that pesticide products are more than the active ingredient(s). Solvents or other “inert” ingredients may contribute to exposures, adding to the diagnostic dilemma. They may also increase the potential for secondary exposure of physicians and other patient care personnel. When exposure to any hazardous substance is suspected, be sure decontamination procedures are followed and health care personnel use appropriate personal protection. In Oregon, cases of secondary exposures have occurred among health care providers, fire fighters, police and other emergency responders.

**CONFIDENTIAL REPORTING**

Workers may not wish to report pesticide poisoning because of often legitimate concern that squeaky worms may get the axe. Migrant and seasonal workers may be particularly vulnerable. Health departments are subject to strict confidentiality

**Acute Health Effects of Selected Pesticide Classes**

Chemical Class (common names)	Acute Symptoms (severe poisoning-ingestion of concentrated product)	Routes of Exposure
Organophosphate Insecticides (chlorpyrifos, diazinon, malathion)	Headache, dizziness, muscle weakness/twitching, nausea, vomiting, diarrhea, confusion, chest tightness, miosis; (pulmonary edema, convulsions)	Dermal, GI, inhalation
Pyrethrin, Pyrethroid Insecticides (permethrin, cyfluthrin)	Irritation and swelling of mucous membranes, asthma, pruritis, contact dermatitis; (possible paresthesias)	Dermal, inhalation
Chlorophenoxy Herbicides (2,4-D, MCPA)	Irritation of site of contact: respiratory mucosa, skin, GI tract; (peripheral and sensory neuropathy, myotonia)	Dermal, GI, inhalation

rules that protect the identity of patients. By law, we may not release information, contact an employer or refer a case to enforcement agencies without the express permission of the affected person.

Health care providers can make confidential referrals for investigations through the OHD; this is particularly important where a patient and co-workers may be at continuing risk for a pesticide-related injury or illness. If a patient wishes to remain anonymous, we can still provide advice about personal protection, safe handling and use of pesticides, and appropriate work practices. We do our best to help each individual in the most appropriate way. Several pesticide program staff members speak Spanish.

**AN OZ. OF PREVENTION**

Information from reported cases is important for identifying health problems with particular pesticide products or uses. As part of a national pesticide poisoning data collection project we provide EPA with exposure and health effects information, without personal identifiers, so that they can make more informed decisions about product registration. Data may also be used for research.

Locally, the information is used to target interventions and recommend action

by other agencies. For example, over five years, nine cases of illness were associated with use of a mildewicide (tributyltin oxide, TBTO) in interior paint. The product was typically labeled for exterior use only, but in very small print. Based upon information provided by the OHD, the Oregon Department of Agriculture required all TBTO paint additives to be labeled for exterior use only—and in a legible and sufficiently prominent type.

Pesticide usage in or near schools has also been a concern, as children may be susceptible to health effects at lower levels of exposure. Each year we receive calls from parents and providers about possible health effects from pesticide applications in schools, on playing fields, or on nearby agricultural lands. In response, OHD has drafted guidelines for schools on record-keeping, posting treated areas, re-entry intervals, and establishing communication with neighbors who use pesticides. This information is sent to school district superintendents biannually, to alert them to potential health and public relations problems and to encourage safe practices.

Reporting suspected pesticide poisoning cases can help you, your patients, and their communities. So pick up the phone and call today.