

Physician Assistants: A Critical Role in Diagnosing and Treating Pesticide Poisonings:

Informing history taking and physical assessment of patients in
ambulatory care settings by Advanced Practice Providers



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Objective 1

Clinicians will consider pesticide toxicity as part of routine differential diagnosis in specified populations



Objective 2

Clinicians will be made aware of resources for support of treatment of pesticide exposed patients



Objective 3

Clinicians will be made aware of resources for mandated reporting of pesticide toxicity where applicable

What are pesticides?



Any substance, or mixture of substances intended for preventing, repelling, destroying, or mitigating any pest. Examples:

- Fumigants
- Insecticides
- Herbicides
- Fungicides
- Rodenticides
- Antimicrobials



<https://cfpub.epa.gov/giwiz/disinfectants/index.cfm>



Why We Miss the Diagnosis

- We simply are not trained to recognize pesticide exposure and related symptoms.
- Exposure is often chronic and symptom onset may be insipid, impairing insight by patient/reporters that today's presentation/chronic problem may be related to toxic exposure
- Presenting symptoms may be attributed to other primary diagnosis (asthma, eczema, vertigo)
- Parents may be reluctant to share that a child/family member has been exposed

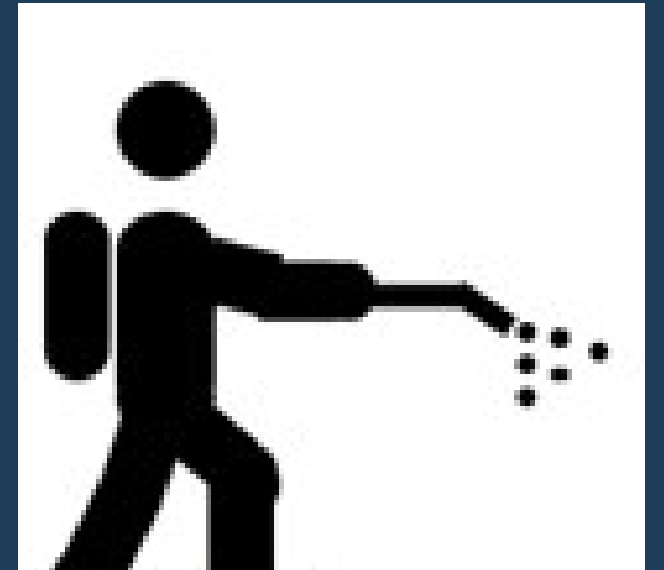
Barriers to Patient Reporting

- Patients may simply be unaware of exposure
- Patients may not attribute presenting symptoms to exposures, especially if exposure is repeated/chronic
- Patients may not be wearing or have access to appropriate PPE
- Employees may be reluctant to report employers responsible for fear of retaliation/job loss
- Parents and caregivers may fear civil consequence for pediatric exposure, even if accidental
- Language/educational/cultural/communication barriers



Who experiences pesticide exposure?

- Farm workers, in any agricultural setting
- Factory/production workers (think meat processing/grain processing)
- Forestry workers
- Hospitality employees, including restaurants
- Landscape/golf course employees
- Anyone living in homes that may be insect/rodent infested
- Patients treated for lice/scabies/bedbugs
- Household members of any of the above



What will present clinically in the absence of an informed history?

- SKIN: contact dermatitis (look for patterning), burns, blisters, sores in/around the mouth, hyperhidrosis
- RESPIRATORY: asthmatic symptoms, vocal cord irritation including hoarseness and globus, salivation, rhinorrhea, lacrimation
- GI: diarrhea, nausea/vomiting, anorexia, mucous in stool
- GU: hematuria
- NEUROLOGIC: headache, dizziness, lethargy, tremor, confusion, convulsions, seizures
- ENDOCRINE: amenorrhea, unexplained weight loss or weight gain, insulin resistance/increased blood sugars, symptoms of hypoglycemia without low blood sugar

Signs & Symptoms of Pesticide Toxicity



EYES



SKIN



CARDIAC



RESPIRATORY



GI



NEUROLOGICAL

When to take an environmental exposure history?

- If someone presents with respiratory s/s, or even mild hypersecretion, followed by ANY neurologic sequelae - even mild
- When a normally chronic illness presents as a new diagnosis. (New onset asthma in a 25 year old male without other atopy)
- When a known illness presents differently than prior (eczema presents in new distribution or is accompanied by desquamation)
- When a contact dermatitis does not improve, or worsens with treatment
- With increased frequency of a patient presentation (a patient who normally is seen twice annually is in twice in a month)
- With endocrine disruption



What will stop me from thinking about pesticide toxicity? (When do I stop DDx?)

When a patient has an exacerbation of an underlying problem which is easily treated. For example – a patient presents with previous asthma, and an asthma exacerbation, gets oral steroids, and refills of SVN.



Long term effects of pesticide exposure: teaching points for patient education

- Inflammation and diseases related to inflammatory conditions such as vasculitis, and lupus.
- Tumors of the prostate, pancreas, kidney and breast
- Non-Hodgkin Lymphoma and Other Hematopoietic Cancers
- Parkinsonism
- Endothelial inflammation and plaque deposition – MI/CAD
- Obesity, DM2



Resources

www.pesticideresources.org/med

The screenshot shows the homepage of the PERC-med website. The logo at the top left features a green cross with a right-pointing arrow, followed by the text "PERC-med" in green and "Pesticide Educational Resources Collaborative - Medical" in smaller green text. A navigation menu includes "Home", "About", "Status", "Newsroom", "Resources", "Reporting", and "Email Updates". A search bar is located on the right side of the menu. Below the menu is a large banner with a dark blue background and an orange circle. The banner contains the text "New to Public Health Residency Program" and a small graphic of a person. Below the banner is a horizontal menu with six items: "Farm Tox CME", "New to Public Health", "Surveillance CME", "Collaborations", "RMPP", and "Pesticide Reporting". The "New to Public Health" item is highlighted in orange. Below the menu is a paragraph of text: "Helping medical professionals prevent, recognize, and treat pesticide-related illness. We have provided resources focused on pesticides and human health issues." To the right of the text are two blue buttons: "Newsroom" and "Calendar of Events".

PERC-med
Pesticide Educational Resources
Collaborative - Medical

Home About Status Newsroom Resources Reporting Email Updates Search...

New to Public Health Residency Program

Farm Tox CME **New to Public Health** Surveillance CME Collaborations RMPP Pesticide Reporting

Helping medical professionals prevent, recognize, and treat pesticide-related illness. We have provided resources focused on pesticides and human health issues.

Newsroom Calendar of Events

PESTICIDE TOXICITY: SIGNS AND SYMPTOMS

Pesticides are toxic by design. **Insecticides** and **rodenticides** are the pesticide types most commonly associated with acute pediatric poisoning. Warfarin type rodenticides in the form of pellets, grains or blocks are also a significant ingestion risk for young children. Many insecticide chemical classes designed to be neurotoxic for insect pests have been shown to be neurotoxic in humans, such as the cholinesterase inhibiting organophosphate and carbamate insecticides and the pyrethroids. Human toxicity varies by the pesticide product's active ingredient(s) and formulation (solvents, carriers). As such, signs and symptoms are broad and may include:



SKIN

irritation, rash, contact dermatitis, blistering, sweating



EYES

lacrimation, conjunctivitis, diplopia, Miosis



CARDIAC

brady/tachycardia, arrhythmias, hypo/hypertension



RESPIRATORY

nasal congestion, airway irritation/cough, dyspnea, asthma exacerbation or wheezing, pulmonary edema



GI

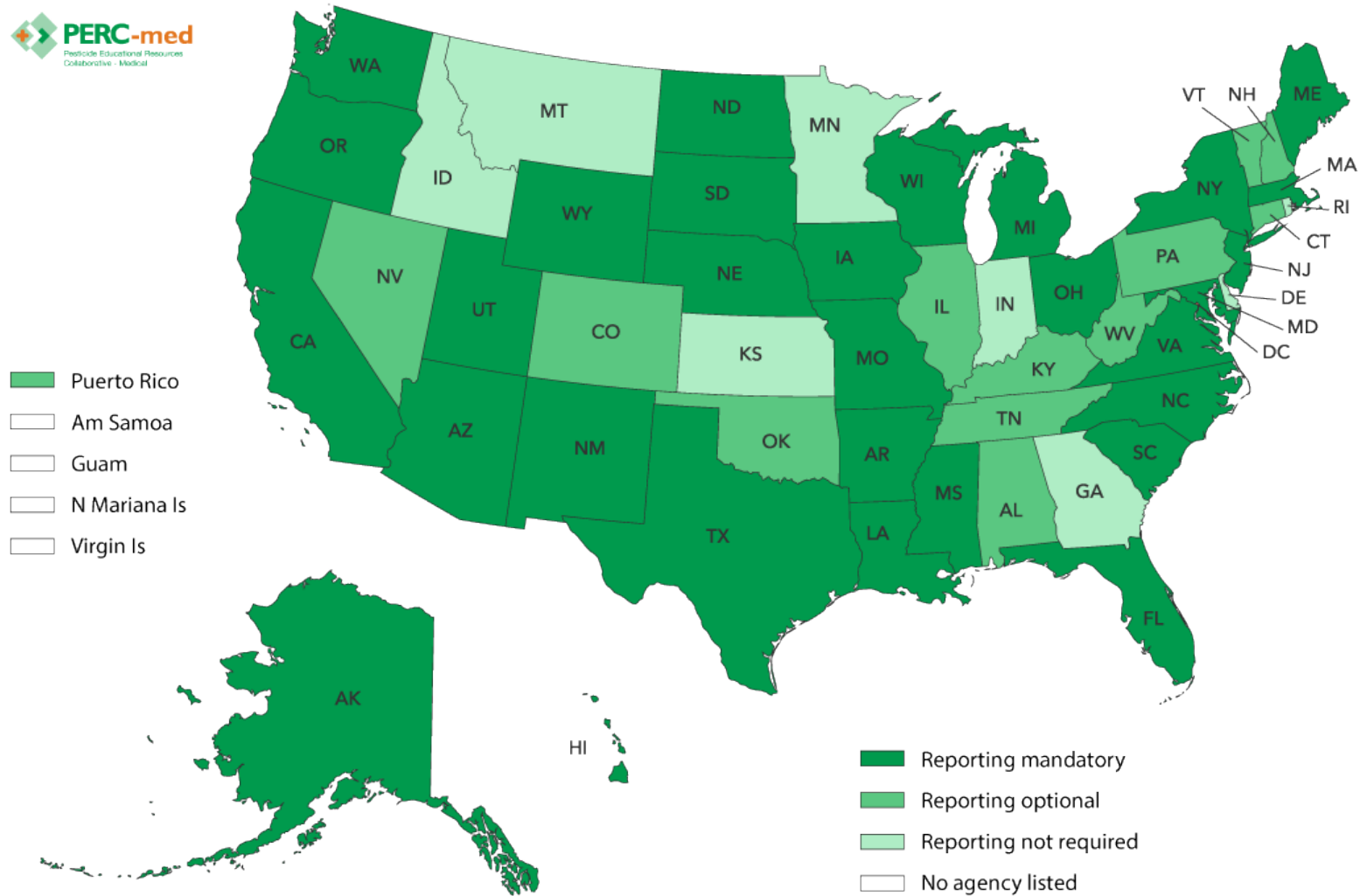
anorexia, nausea, vomiting, diarrhea, abdominal pain, salivation




NEUROLOGICAL

skin paresthesias, muscle twitching, tremor, weakness or incoordination, dizziness, lethargy, confusion, seizures, CNS depression, coma

Pesticide Reporting Requirements



<http://pesticideresources.org/med/reportingMap.html>




Welcome

To OEHHA's courses for health care professionals on pesticide-related illness and injury.

Create a new account

OR

Login as guest



You must register to receive a medical education credit for RN and MD or a general certificate.

Already registered?

 Remember username
[Forgot username or password?](#)

Login

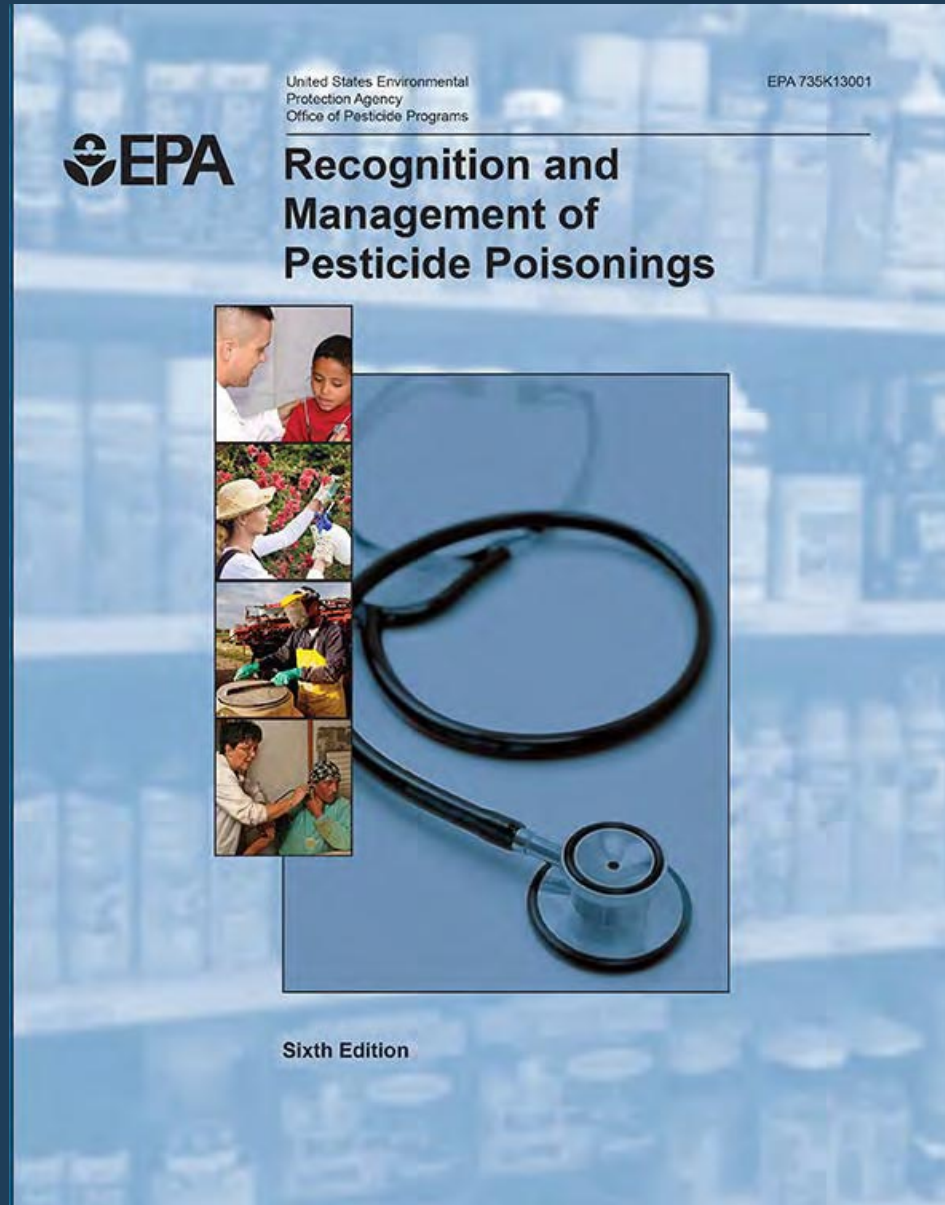
Free Online CME

OEHHA's course for health care professionals on pesticide-related illnesses and injuries.

<http://pesticideresources.org/med/resources/training.html>

Recommended Clinical Reference

Recognition and
Management of
Pesticide Poisonings



<http://pesticideresources.org//med/resources/rmpp.html>

LICE SHAMPOO OVEREXPOSURE



AGE CONSIDERATION

- Vulnerability of Children
- Biological
- Behavioral
- Sociocultural Issues

POSSIBLE LEGAL ISSUES

- Effectiveness of EO 13045
- EPA
 - Children's Health Policy
 - EPA Ban
- National Agenda

POSSIBLE SOCIAL ISSUES

- Substandard Housing
- Poor Diet
- Inadequate Health Care
- Exposure to Take Home Toxins

REPORTING ADVERSE EFFECTS

- Poison Control Center
- Other Community Resources
- Emergency Room
- Health Care Providers

A 3 year old Hispanic male was brought to the local emergency room by his Mother after experiencing a seizure in his home. Prior to this event, the child was discovered with the contents of a half-filled 2 ounce bottle of Lindane lice shampoo which he retrieved from the medicine cabinet in his home. His mother noted that the contents were on his cheek and chin, and he was trying to spit out the liquid; thus she induced vomiting by sticking her finger in his throat. She called her local poison control center and was told that the product can cause seizures; but that her child probably did not ingest enough to be at risk. She was advised to give him fluids to dilute the lindane that was ingested. About an hour later, the child fell on the bathroom floor and immediately began seizing (body stiffened, eyes rolled back in head, jaw shut tight, foamed at mouth); this seizure lasted for about 4 to 5 minutes.

ASSESSMENT AND PREVENTION

- Determining Exposure
- Acute Symptoms of Exposure
- Long Term Effects
- Precautions

ABOUT LINDANE SHAMPOO

- Pharmacological Properties
- Purpose
- When to Use
- Contraindications

SOURCES OF EXPOSURE

- Ingestion
- Absorption

TREATMENT

- Neurological Problems
- Dermatological Problems
- Gastrointestinal Problems
- Long Term Effects



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Original case study by:

PHEMED - PESTICIDE HEALTH EFFECTS MEDICAL EDUCATION DATABASE

...because open source matters.

Future Directions

- Champion recruitment pilot
- Coding / billing sheet
- Conferences



Thank you!

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Follow PERC-med:  



Resources: Original PERC-med Works



Pesticide Illness & Family Medicine: How to Report in Your State

www.pesticideresources.org/med
PERC-medSupport@ucdavis.edu

In the United States, pesticide usage is:

- ubiquitous
- estimated to total over 1.1 billion pounds annually (1).
- defined as any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest.

Microorganisms, viruses and bacteria are included in the definition of pests.



High-risk occupations:

- both direct and indirect pesticide exposures
- the agriculture, hospitality, healthcare, building and grounds, environmental cleaning, forestry, and maintenance industries.

Concerns:

- Take home exposures,
- Pesticide residues may cling to a worker's skin, clothing, and work items creating potential for additional pesticide exposure for the worker's family.
- The COVID-19 pandemic has increased the use of antimicrobial pesticides (disinfectants) to help control the spread of SARS CoV-2. While antimicrobial pesticides are essential public health tools used in hospitals, schools, bathrooms and food preparation areas, there are risks related to their use.

Healthcare professionals play a critical role in recognizing and reporting pesticide-related illnesses. Pesticide illness surveillance information is used to inform policy and ideally prevent future pesticide illnesses. Additionally, it can identify at-risk populations, emerging pesticide issues, and occupations with increased exposure risks.

QR
Code
Here

PERC-med developed an **online interactive map** and database covering the essentials of healthcare provider reporting of pesticide illnesses in all states and territories of the United States.

- Purpose: provide healthcare providers with an accurate and up to date tool to find information on their state's pesticide reporting requirements.
- Healthcare providers should be able to locate reporting requirements in their specific state(s) of practice.
- For states and territories that have mandatory or optional reporting, the tool describes who is required to report, what is defined as reportable, when the exposure needs to be reported by, and where it should be reported.

Reference

1. U.S. Environmental Protection Agency. Pesticides Industry Sales&Usage 2008-2012 Market Estimates, 2017.

The Pesticide Educational Resources Collaborative - Medical is a cooperative agreement (agreement #X-83935901) between the U.S. EPA's Office of Pesticide Programs and University of California Davis Extension, in collaboration with Oregon State University. PERC-med is funded by the U.S.EPA with the aim of helping medical professionals prevent, recognize and treat pesticide-related illnesses and injuries.

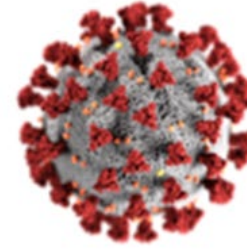
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Pesticide Educational Resources
Collaborative - Medical



What do Pesticides have to do with SARS-CoV-2 and COVID-19?

By: Diana R. Simmes, MPH and Rebecca Bellosso, MPH
PERC-med in Collaboration with the National Pesticide Information Center
www.pesticideresources.org/med

Originally Published March 2020
in the Northwest Regional Primary Care Association (NWRPCA) Newsletter
Updated November 2020

You may be surprised to learn that many infection control products commonly used in healthcare are actually pesticides.

More specifically, they are [antimicrobial](#) pesticides. Antimicrobial pesticides are essential public health tools because we use them in hospitals, schools, bathrooms and food preparation areas to prevent the spread of germs that can cause disease. So, what exactly constitutes a pesticide? A pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Microorganisms, bacteria and viruses are included in the definition of pests. Pesticides help protect our food, water, and health. However, there are always risks related to their use.