PEHSU Pediatric Environmental Health Specialty Units

Identifying, Managing, and Preventing Pesticide Poisoning in Children:

Basic Guidelines for Clinicians

Children have enhanced susceptibility to the uptake and toxicity of pesticides. Pesticides vary in toxicity and health effects by their chemical class. Organophosphates and pyrethroid are classes commonly involved in child pesticide poisonings. Clinicians can prevent significant health consequences of pesticide exposure by promptly recognizing acute poisonings and providing guidance to parents to reduce everyday exposures. This factsheet addresses recognizing exposure, managing suspected acute poisoning, preventing cumulative low-level exposures, and key resources for clinicians.

Key Steps to Recognizing and Managing ACUTE Pesticide Exposures in Children:

Adapted from **EPA Recognition and Management of Pesticide Poisoning. 6th Ed. (Key Resources)**

Recognize Exposures and Pesticide Toxicity

Common symptoms: rash, mucous membrane irritation, skin paresthesias, asthma exacerbation, flu-like symptoms, muscle twitching, weakness, or incoordination, lethargy, seizures, coma. Suspicious signs: meiosis, CNS depression. Since the symptoms are often nonspecific, diagnosis is dependent on determining that an exposure occurred. Screen all symptomatic children for possible exposures:

- *Do you think your child's health problems are related to home, daycare, school, or another location?*
- *Is it possible your child has been exposed to pesticides? Are they used or stored in the home?*
- *What kind of work do you or other household members do?*

Identify Pesticides Involved

To determine pesticide class from name/label/MSDS:

- Call the WA Dept. of Health or Poison Center
- Search National Pesticide Information Center's (NPIC) online database

Decontaminate/ABC's

Stabilize the child if symptoms are life threatening. Decontaminate if suspect ongoing exposure due to pesticide residues on skin, clothing, or in the gut.

Take a Detailed Exposure History

When? Where?
How (oral, dermal, ocular, respiratory)? How much?

Treat: Consult Specialists

Treatment varies by pesticide class.

- Call the **WA Poison Center (1-800-222-1222)** for treatment guidance from an experienced Clinical Toxicologist
- Refer to the EPA's manual *Recognition and Management of Pesticide Poisoning*

Obtain Samples

If suspect Organophosphate or Carbamate Exposure:

- Obtain blood for STAT cholinesterase testing -if available

Collect Evidence of Exposure (for future analysis):

- Heparinized whole blood & plasma samples (refrigerate)
- Fresh urine sample (freeze)
- Contaminated clothing/articles (plastic bagged/freeze)

Report and Follow up

Suspected pesticide-related illness is reportable in WA State (WAC 246-101-101). Report all suspected cases of acute or non-acute pesticide related illness to the Washington Dept. of Health Pesticide Program 1-877-485-7316 (Monday-Friday, 8 a.m. to 5 p.m.) or to the Washington Poison Center: 1-800-222-1222 (24hrs/7days a week). To find out if reporting is mandatory in your state, go to NPIC's website at http://npic.orst.edu/mcapro/incidentreporting.html

Non-acute Exposures in Children and Health

Subclinical exposures are far more common than acute poisoning episodes. Low dose chronic exposures in early life are increasingly linked to risk of chronic impairment and disease. Evidence suggests that chronic exposure to pesticides during preconception, during pregnancy, and in childhood is associated with several important pediatric morbidities:

- Neurocognitive and neurobehavioral deficits (reduced IQ, inattention/ADHD, pervasive developmental disorders)
- Childhood Cancer (brain, leukemia)
- Adverse birth outcomes- reduced intrauterine growth, fetal death, preterm birth, and congenital anomalies

Advising patients and their families on how to reduce pesticide exposure provides clinicians an opportunity to address a potentially modifiable risk factor for these multi-factorial diseases.

Reducing Risk through Anticipatory Guidance

Recognizing Exposures to Children and Pregnant Women– Take an Environmental History

Taking an environmental history identifies current or potential exposure sources and serves as a platform for providing prevention guidance to families. A few simple questions can screen for at risk patients. Ask parents if they or their children are exposed to pesticides. For an example of a brief but comprehensive screening tool, see the Pediatric Environmental History Form link in Key Resources.

Pesticides in Agricultural Communities

What we Know: Children living in close proximity to agricultural areas, living with someone who works in agriculture, or living in a home where pesticides are used are at risk of higher exposures.
What to do: Instruct families to notify their clinicians or their local Department of Health if they experience (or suspect) a pesticide drift from spraying in nearby fields/farms. Educate young workers and household members who work with pesticides on risks of exposure and preventing occupational and take home exposures.

- Know the name and associated warnings for pesticides you work with and always follow product instructions. Know where to find this information.
- Wash hands and face and change out of contaminated clothes and shoes before returning home, entering car, and wash contaminated clothes separately from the rest of the laundry.

Pesticides in and around the Home, School or Daycare

What we Know: Nontoxic or low toxicity pest control methods are available for all common pest problems.
What to Do: Encourage non-toxic or least toxic pest control methods (see "Citizens Guide" in resources). Keeping home clear of dust and dirt may reduce pesticide residues. When pesticides are stored or used provide guidance to include: safe storage in out of reach childproof cabinets or sheds, keep pesticides in their original containers with labels intact and never reuse containers for other purposes. Read warnings on label and always follow instructions. Only use a licensed pest control company and ask for the name, ingredients and toxicity of the products they will be using.

Pesticides in the Diets of Children

What we Know: The American Academy of Pediatrics recommends choosing organic produce as a way to reduce pesticide exposure, but emphasizes that a diet high in a variety of fruits and vegetables, whether conventionally or organically grown, is most important to a child's health when cost or availability are factors.
What to do: Advise families on ways to reduce exposure.

- Wash and scrub produce with water (cleansers not necessary), throw away the outer leaves of leafy vegetables, and trim the skin and fat from poultry, fish and meats.
- Purchase organic when possible, but not at the expense of a diet rich in a variety of fresh fruits and vegetables. (See Shoppers Guide in resources)

KEY RESOURCES for Clinicians

1. EPA Recognition and Management of Pesticide Poisoning. 6th Edition.
A comprehensive guide to pesticide exposure and the toxicology, clinical presentation, and treatment of pesticide poisonings. Contains a sample exposure history. May view online or order a free copy at:
http://www2.epa.gov/pesticide-worker-safety/recognition-and-management-pesticide-poisonings.

2. WA State Department of Health (1-877-485-7316)
Pesticide Illness Monitoring and Prevention Program: Investigates cases to document chemicals involved, identify exposure scenario, and determine common root causes of preventable illness. Website has a list of resources for clinical management and laboratory analysis.
http://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/NotifiableConditions/Pesticide

3. WA Poison Center (1-800-222-1222)
Phone consultation for: identifying pesticide class from name brand or label ingredient list, pesticide specific treatment plans for acute poisonings, and reporting of suspected or confirmed pesticide poisoning/exposures.

4. **NW Pediatric Environmental Health Specialty Unit (NW PEHSU) (1-877-KID CHEM or pehsu@uw.edu)**
Free consultation for clinicians and public health professionals for *non-acute* issues related to environmental exposures and child health. More information , this and other factsheets available at:
http://depts.washington.edu/pehsu/

5. NPIC- National Pesticide Information Center. (1-800-858-7378 or npic@ace.orst.edu)
NPIC provides objective, science-based information about pesticides and pesticide-related topics to enable people to make informed decisions about pesticides and their use. http://npic.orst.edu/

6. Roberts JR, Karr CJ; Council on Environmental Health. American Academy of Pediatrics. **Pesticide exposure in children. Technical Report. Pediatrics. 2012**;130(6): *e1765 -e1788.*
Provides a summary of current research evidence on the health effects of acute/chronic pesticide exposures.
http://pediatrics.aappublications.org/content/early/2012/11/21/peds.2012-2758

7. The National Environmental Education Foundation – Sample Pediatric Environmental History screening form. http://www.neefusa.org/health/PEHI/historyform.htm

8. Project LEAF (Limiting Exposures Around Families)
Printable brochures (Eng/Spn) for agricultural workers on reducing pesticide exposure in children, including take-home exposures from occupational sources. http://go.usa.gov/28hk

9. American Academy of Pediatrics
Clinical Report, "Organic Foods: Health and Environmental Advantages and Disadvantages"
http://pediatrics.aappublications.org/content/early/2012/10/15/peds.2012-2579

10. Shoppers Guide to Pesticides in Produce: Quick guide on produce with most/least common pesticide residue detection. www.ewg.org/foodnews/

11. US EPA Citizens Guide to Pest Control and Pesticides: Comprehensive pest control and pesticide safety information: how to use, choose, store, and dispose of pest control products safely.
http://www.epa.gov/oppfead1/Publications/Cit_Guide/citguide.pdf

Authors: C Karr MD PHD, M Willis BSN (NW PEHSU) Last updated August 2014.
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