Northwest PEHSU
Pediatric Environmental Health Specialty Units

PERC-med
Pesticide Educational Resources Collaborative - Medical

RECOGNIZING ACUTE PESTICIDE POISONING IN CHILDREN

Poison Control Center data shows over 35,000 calls related to pesticide exposure concerns for children ≤ 5 years old (2018). Most serious acute poisonings occur after unintentional ingestion, although poisoning may also follow inhalational exposure (particularly from fumigants) and/or significant dermal exposure, such as in drift events. Misuse, such as violating label instructions, may also lead to overexposure. It is well recognized that pesticide poisonings are likely to be underreported because of difficulty with diagnosis, incomplete reporting and symptoms not being recognized as a poisoning. **High risk children may include those who:**

- **spend time at home, school or play areas where pesticides are applied frequently or stored**
- **live next to agricultural land where pesticides are sprayed**
- **work in agriculture or on family farms**
- **live in households with someone who works with or around pesticides**

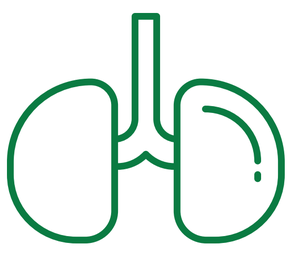
PESTICIDE TOXICITY: SIGNS AND SYMPTOMS

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. Long acting superwarfarin anticoagulant rodenticides are associated with multi-site hemorrhage. 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

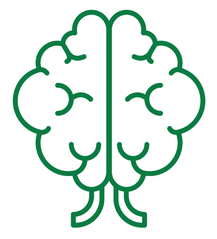
EYES
lacrimation, conjunctivitis, diplopia, Miosis

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



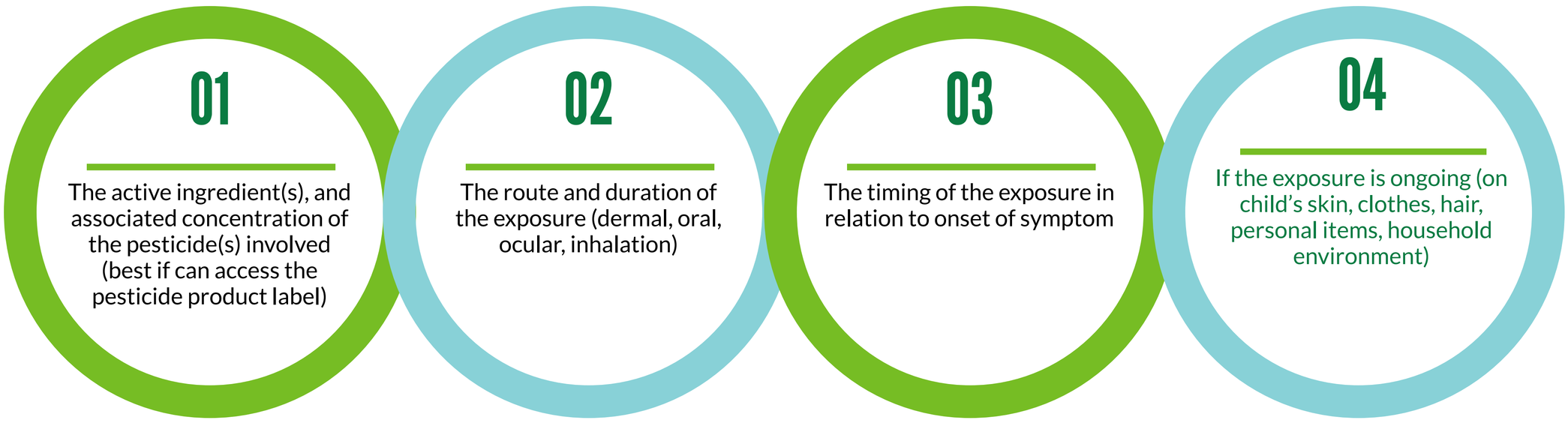
NEUROLOGICAL
skin paresthesias, muscle twitching, tremor, weakness or incoordination, dizziness, lethargy, confusion, seizures, CNS depression, coma

Making the Diagnosis

Many of the signs and symptoms related to acute pesticide exposure are nonspecific and resemble other common childhood illnesses. **Making the diagnosis depends on identifying that an exposure occurred and determining that the exposure scenario was likely to lead to significant uptake by the child (dose received) and the signs and symptoms experienced.**

EXPOSURE HISTORY

For a child with nonspecific symptoms, determine if the child might have been exposed to pesticides or other chemicals in suspected illness events. It is important to try to find out:



Then determine if pesticide of concern (i.e., pesticide active ingredient(s)) is associated with the child's signs and symptoms. EPA's Recognition and Management of Pesticide Poisonings offers a comprehensive online Index of Signs and Symptoms organized by pesticide class that can be helpful.

Deciphering the linkage of signs and symptoms to pesticide exposure, further work up, and poisoning management may require consultation with a specialist.

For acute and severe poisoning management, contact the Poison Control Center (800-222-1222). The regional PEHSU programs can provide consultation for subacute concerns, post-acute phase questions, or assistance in determining pesticide active ingredients and potential toxicity (www.pehsu.net).

Diagnostics and Laboratory Tests

Cholinesterase testing may be useful for guiding the early treatment of suspected organophosphate and carbamate pesticide poisoning. Preserved urine or clothing samples may be useful for future analysis as evidence of exposure or to assist in public health investigations. Samples should be obtained as soon as possible as many pesticides metabolize quickly.

Reporting

Clinician report of suspected pesticide related illnesses is required by law in many states, though the circumstances under which reporting is required vary. Regardless, clinicians should notify the local or state public health department or state pesticide regulatory agency if the exposure source may present a hazard to others or if help is desired in identifying an environmental exposure source. State-specific reporting requirements can be found at http://pesticideresources.org/med/reporting.html.

References

EPA's Recognition and Management of Pesticide Poisonings

Pesticide Educational Resources Collaborative-Medical (PERC-med)

Roberts JR, Karr CJ. Technical Report: Pesticide Exposure in Children

Authors

Margaret Willis, BSN, MPH

MaryKate Cardon, BSN, RN

Catherine J. Karr, MD, PhD

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