

ORGANOPHOSPHATE PESTICIDES & CHILD HEALTH:

A Primer for Health Care Providers



REPORTING, PUBLIC HEALTH & REGULATION

REPORTING

In addition to providing support in the form of a clinical toxicologist consultation, the local poison control center informs you that there is a reporting requirement for suspected pesticide related illness in your state.

In the US, state legislatures have the authority to require disease reporting, which they exercise through laws and statutes. Several states have pesticide illness reporting statutes and rules in place²⁷.

The CDC lists the following as primary purposes of pesticide poisoning surveillance:

- Reduce the incidence of acute pesticide-related illness/injury.
- Identify clusters/outbreaks of pesticide-related illness/injury.
- Identify new pesticide problems and research needs.
- Identify high-risk pesticide active ingredients and products associated with pesticide-related illness.
- Identify groups at-risk for pesticide-related illness.
- Document the distribution of acute pesticide-related illness.
- Target regulatory, enforcement, consultative, or educational interventions to prevent and control pesticide-related illness/injury.
- Evaluate the effectiveness of prevention efforts.
- Focus public attention on occupational/environmental health problems.
- Explore the feasibility of generating useful rate estimates and trend data.
- Generate research hypotheses.

Reporting a pesticide illness can be done over the phone with either your local poison control center or your state department of health. Ultimately such information is used to guide outreach strategies for pesticide illness prevention. In Washington state, pesticide-related hospitalizations and deaths must be reported immediately, and all other suspected pesticide-related cases within 3 days.²⁸

While on the phone with poison control, you file a pesticide illness report for Isabella. A staff member from the health department in your state subsequently contacts you. They ask you a few questions regarding the exposure scenario and symptoms experienced by Isabella.

PUBLIC HEALTH

During your consult with the health department, they point out the importance of José and Rosa being evaluated by a physician for potential organophosphate (OP) poisoning. The health department also offers advice and resources for the family on how to ensure their home is safe for re-occupancy.

José and Rosa receive a health evaluation focused on OP exposure, including cholinesterase testing. While their evaluation suggests they did not suffer acute health problems, José expresses concern about his brother-in-law's household because he had provided some of the pesticide to him. Further history taking reveals that José's brother-in-law had not yet applied the pesticide in his home. Based on Isabella's illness and your advice, he no longer plans to do so. This serves to preclude the exposure of the 3 young children and 3 adults who reside in his home.

In addition, José learns that he is eligible for the State's cholinesterase monitoring program for pesticide applicators. He plans to enroll in this routine surveillance.

More than half (57%) of all reported pesticide poisonings in the US occur in children younger than 6 years (nearly 50,000 children per year). The number of pesticide poisonings is thought to be grossly under-estimated due to a lack of national surveillance efforts, a lack of trained health care providers, and problems with access to care for at-risk populations (e.g. farm workers).

Given the non-specific nature of symptom presentation, misdiagnosis of childhood pesticide poisoning is also a problem.^{1,2} A review of 20 infants and children whose final diagnosis was poisoning by organophosphate and carbamate pesticides showed that 16 (80%) had an incorrect diagnosis

(ranging from encephalopathy and seizure disorder to pneumonia and pertussis) at the time of transfer to the Dallas Children's Medical Center. ¹

Astute clinicians who report suspected pesticide poisonings aid in efforts to better characterize the impacts of pesticides on the population as a whole. A better understanding of the risk factors and incidence of pesticide poisonings will improve the public's health by reducing the risk of future adverse health events.

REGULATION

You learn from the health department that the organophosphate pesticide that poisoned Isabella is no longer registered for household use because of child health concerns. The pesticide is still legal, and widely used, in agricultural settings.

The health department relays the experience of this case to colleagues engaged in workplace health and safety training. Future trainings were modified to specifically address the dangers and problems associated with bringing pesticide chemicals from the workplace to the home.

The regulations surrounding pesticide use in the workplace are relevant for pediatric environmental health, as childhood pesticide exposure can have its origin at the workplace. In our case study, sentinel event reporting of a childhood pesticide poisoning ultimately led to a change in workplace practice: modified worker pesticide training. [By reporting suspected pesticide poisoning events, public health entities are alerted to the need to enforce, or change, current regulatory practices.](#)

Isabella improves relatively rapidly over the 2 days following her ultimate diagnosis of organophosphate poisoning and treatment in the hospital. She is discharged in satisfactory condition to her home.