CHAPTER 3

Environmental and Occupational History

Pesticide poisonings may go unrecognized because of the failure to take a proper exposure history. This chapter is intended to remedy this often overlooked area by providing basic tools for taking a complete exposure history. In some situations where exposures are complex or multiple and/or symptoms atypical, it is important to consider consultation with clinical toxicologists or specialists in environmental and occupational medicine. Local Poison Control Centers should also be considered when there are questions about diagnosis and treatment.

Although this manual deals primarily with pesticide-related diseases and injury, the approach to identifying exposures is similar regardless of the specific hazard involved. It is important to ascertain whether other non-pesticide exposures are involved because of potential interactions between these hazards and the pesticide of interest (e.g., pesticide intoxication and heat stress in agricultural field workers). Thus, the following section on pesticide exposures should be seen in the context of an overall exposure assessment.

Most pesticide-related diseases have clinical presentations that are similar to common medical conditions and display nonspecific symptoms and physical signs. Knowledge of a patient's exposure to occupational and environmental factors is important for diagnostic, therapeutic, rehabilitative and public health purposes. Thus, it is essential to obtain an adequate history of any environmental or occupational exposure which could cause disease or exacerbate an existing medical condition.

In addition to the appropriate patient history-taking, one must also consider any other persons that may be similarly exposed in the home, work or community environment. Each environmental or occupational disease identified should be considered a potential sentinel health event which may require follow-up activities to identify the exposure source and any additional cases. By identifying and eliminating the exposure source, one can prevent continued exposure to the initial patient and any other individuals involved.

Patients with these types of diseases may be seen by health care providers that are not familiar with these conditions. If an appropriate history is obtained and there appears to be a suspect environmental or occupational exposure, the health care provider can obtain consultation with specialists (e.g., industrial hygienists, toxicologists, medical specialists, etc.) in the field of environmental and occupational health. For the more severe sentinel health events and those

that involve numerous exposed individuals, additional assistance can be obtained by contacting the state health department, state regulatory agency (e.g., the agriculture department in the case of pesticide illness and injury), or other related organizations (see list at end of chapter). Furthermore, some states require reporting of certain environmental and occupational conditions (e.g., pesticide case reporting in Arizona, California, Florida, Oregon, Texas, and Washington).

This chapter reviews the types of questions to be asked in taking an occupational and environmental history (for both adult and pediatric patients), discusses legal, ethical, and public health considerations, and lists information resources.

Taking an Exposure History

Given the time constraints of most health care providers, a few screening questions are likely to be preferable to a lengthy questionnaire in identifying occupational or environmental hazards. The screening questions below could be incorporated into an existing general health questionnaire or routine patient interview.

SCREENING QUESTIONS FOR OCCUPATIONAL AND ENVIRONMENTAL EXPOSURES*

For an adult patient:
After establishing the chief complaint and history of the presenting illness:

- What kind of work do you do?
- *(if unemployed)* Do you think your health problems are related to your home or other location?
- *(if employed)* Do you think your health problems are related to your work? Are your symptoms better or worse when you are at home or at work?
- Are you now or have you previously been exposed to pesticides, solvents, or other chemicals, dusts, fumes, radiation, or loud noise?

For a pediatric patient (questions asked of parent or guardian):

- Do you think the patient's health problems are related to the home, daycare, school, or other location?
- Has there been any exposure to pesticides, solvents or other chemicals, dusts, fumes, radiation, or loud noise?
- What kind of work do the parents or other household members engage in?

If the clinical presentation or initial medical history suggests a potential occupational or environmental exposure, a detailed exposure interview is needed. An extensive exposure history provides a more complete picture of pertinent exposure factors and can take up to an hour. The detailed interview includes questions on occupational exposure, environmental exposure, symptoms and medical conditions, and non-occupational exposure potentially related to illness or injury. Although the focus is on pesticide exposures and related health

effects, concurrent non-pesticide exposures need to be considered in the overall patient health assessment. Questions typical of a detailed interview are listed on the next several pages, preceded by special concerns in addressing exposures of children and agricultural workers. For further details on taking a history for all types of occupational and environmental hazards, consult the ATSDR monograph entitled "Taking an Exposure History"[1] or a general occupational and environmental medicine reference text.[2]

Special Patient Populations

Children

In comparison to adults, children may be at greater risk from pesticide exposures due to growth and developmental factors. Consideration of fetal, infant, toddler or child characteristics is helpful in an exposure evaluation: physical location, breathing zones, oxygen consumption, food consumption, types of foods consumed and normal behavioral development.[3] Furthermore, transplacental absorption and breast milk may pose additional routes of exposure. Although environmental (and, at times, occupational) exposure to pesticides is the focus of this chapter, the most significant hazard for children is unintentional ingestion.[4] Thus, it is very important to ask about pesticides used and stored in the home, day care facility, school, and play areas.

Agricultural Workers

Data from California's mandatory pesticide poisoning reporting system would imply an annual national estimate of 10,000-20,000 cases of farmworker poisoning.[5] However, it is believed that these figures still represent serious underreporting due to the lack of medical access for many farmworkers and misdiagnosis by some clinicians. For these high-risk patients, the exposure history should include specific questions about the agricultural work being done. For example:

- Are pesticides being used at home or work?
- Were the fields wet when you were picking?
- Was any spraying going on while you were working in the fields?
- Do you get sick during or after working in the fields?

The use of pesticides in the residence and taking home agricultural pesticides or contaminated work clothes that are not properly separated from other clothes may pose hazards for other household members as well.

Obtaining Additional Pesticide Information

In addition to the patient history, it is often helpful to obtain further information on suspect pesticide products. Two documents are useful starting points

DETAILED INTERVIEW FOR OCCUPATIONAL AND ENVIRONMENTAL EXPOSURES

(Questions marked in bold type are especially important for a pesticide exposure history)

(1) Adult Patient

OCCUPATIONAL EXPOSURE

- **What is your occupation?** (If unemployed, go to next section)
- **How long have you been doing this job?**
- **Describe your work and what hazards you are exposed to (e.g., pesticides,** solvents or other chemicals, dust, fumes, metals, fibers, radiation, biologic agents, noise, heat, cold, vibration)
- **Under what circumstances do you use protective equipment? (e.g., work clothes, safety glasses, respirator, gloves,** and hearing protection)
- **Do you smoke or eat at the worksite?**
- **List previous jobs in chronological order, include full and part-time, temporary, second jobs, summer jobs, and military experience.** *(Because this question can take a long time to answer, one option is to ask the patient to fill out a form with this question on it prior to the formal history taking by the clinician. Another option is to take a shorter history by asking the patient to list only the prior jobs that involved the agents of interest. For example, one could ask for all current and past jobs involving pesticide exposure.)*

ENVIRONMENTAL EXPOSURE HISTORY

- **Are pesticides (e.g., bug or weed killers, flea and tick sprays, collars, powders, or shampoos) used in your home or garden or on your pet?**
- **Do you or any household member have a hobby with exposure to any hazardous materials** (e.g., **pesticides**, paints, ceramics, solvents, metals, glues)?
- **If pesticides are used:**
  - **Is a licensed pesticide applicator involved?**
  - **Are children allowed to play in areas recently treated with pesticides?**
  - **Where are the pesticides stored?**
  - **Is food handled properly (e.g., washing of raw fruits and vegetables)?**
- **Did you ever live near a facility which could have contaminated the surrounding area** (e.g., mine, **plant**, smelter, **dump site**)?
- **Have you ever changed your residence because of a health problem?**
- **Does your drinking water come from a private well, city water supply, and/or grocery store?**
- Do you work on your car?
- Which of the following do you have in your home: air conditioner/purifier, central heating (gas or oil), gas stove, electric stove, fireplace, wood stove, or humidifier?
- Have you recently acquired new furniture or carpet, or remodeled your home?
- Have you weatherized your home recently?
- Approximately what year was your home built?

SYMPTOMS AND MEDICAL CONDITIONS

(If employed)

- **Does the timing of your symptoms have any relationship to your work hours?**
- **Has anyone else at work suffered the same or similar problems?**
- **Does the timing of your symptoms have any relationship to environmental activities listed above?**
- **Has any other household member or nearby neighbor suffered similar health problems?**

NON-OCCUPATIONAL EXPOSURES POTENTIALLY RELATED TO ILLNESS OR INJURY

- **Do you use tobacco?** If yes, in what forms (cigarettes, pipe, cigar, chewing tobacco)? About how many do you smoke or how much tobacco do you use per day? At what age did you start using tobacco? Are there other tobacco smokers in the home?
- **Do you drink alcohol?** How much per day or week? At what age did you start?
- **What medications or drugs are you taking?** *(Include prescription and non-prescription uses)*
- **Has anyone in the family worked with hazardous materials that they might have brought home (e.g., pesticides,** asbestos, lead)? (*If yes, inquire about household members potentially exposed.)*

(2) Pediatric Patient (questions asked of parent or guardian)

OCCUPATIONAL EXPOSURE

- **What is your occupation and that of other household members?** (If no employed individuals, go to next section)
- **Describe your work and what hazards you are exposed to (e.g., pesticides,** solvents or other chemicals, dust, fumes, metals, fibers, radiation, biologic agents, noise, heat, cold, vibration)

ENVIRONMENTAL EXPOSURE HISTORY

- **Are pesticides (e.g., bug or weed killers, flea and tick sprays, collars, powders, or shampoos) used in your home or garden or on your pet?**
- **Do you or any household member have a hobby with exposure to any hazardous materials (e.g., pesticides,** paints, ceramics, solvents, metals, glues**)?**
- **If pesticides are used:**
  - **Is a licensed pesticide applicator involved?**
  - **Are children allowed to play in areas recently treated with pesticides?**
  - **Where are the pesticides stored?**
  - **Is food handled properly (e.g., washing of raw fruits and vegetables)?**
- **Has the patient ever lived near a facility which could have contaminated the surrounding area** (e.g., mine, **plant**, smelter, **dump site**)?
- **Has the patient ever changed residence because of a health problem?**
- **Does the patient's drinking water come from a private well, city water supply, and/or grocery store?**
- Which of the following are in the patient's home: air conditioner/purifier, central heating (gas or oil), gas stove, electric stove, fireplace, wood stove, or humidifier?
- Is there recently acquired new furniture or carpet, or recent home remodeling in the patient's home?
- Has the home been weatherized recently?
- Approximately what year was the home built?

SYMPTOMS AND MEDICAL CONDITIONS

- **Does the timing of symptoms have any relationship to environmental activities listed above?**
- **Has any other household member or nearby neighbor suffered similar health problems?**

NON-OCCUPATIONAL EXPOSURES POTENTIALLY RELATED TO ILLNESS OR INJURY

- **Are there tobacco smokers in the home?** If yes, in what forms (cigarettes, pipe, cigar, chewing tobacco)?
- **What medications or drugs is the patient taking?** *(Include prescription and non-prescription uses)*
- **Has anyone in the family worked with hazardous materials that they might have brought home (e.g., pesticides,** asbestos, lead)? (*If yes, inquire about household members potentially exposed.)*

in the identification and evaluation of the pesticide exposure: the material safety data sheet (MSDS) and the pesticide label.

- **Material Safety Data Sheet (MSDS).** Under OSHA's Hazard Communications Standard (29 CFR 1910.1200), all chemical manufacturers are required to provide an MSDS for each hazardous chemical they produce or import. Employers are required to keep copies of MSDSs and make them available to the workers. The following items are contained in an MSDS:
  - Material identification
  - Ingredients and occupational exposure limits
  - Physical data
  - Fire and explosion data
  - Reactivity data
  - Health hazard data
  - Spill, leak, and disposal procedures
  - Special protection data
  - Special precautions and comments.

  These documents tend to have very limited information on health effects and some of the active ingredients may be omitted due to trade secret considerations. One cannot rely solely on an MSDS in making medical determinations.

- **Pesticide label.** EPA requires that all pesticide products bear labels that provide certain information. This information can help in evaluating pesticide health effects and necessary precautions. The items covered include the following:
  - Product name
  - Manufacturer
  - EPA registration number
  - Active ingredients
  - Precautionary statements:
    i. Human hazard signal words "Danger" (most hazardous), "Warning," and "Caution" (least hazardous)
    ii. Child hazard warning
    iii. Statement of practical treatment (signs and symptoms of poisoning, first aid, antidotes, and note to physicians in the event of a poisoning)
    iv. Hazards to humans and domestic animals
    v. Environmental hazards
    vi. Physical or chemical hazards

- Directions for use
- Name and address of manufacturer
- Net contents
- EPA registration number
- EPA establishment number
- Worker Protection Standard (WPS) designation, including restricted entry interval and personal protection equipment required (see WPS description on page 25).

The EPA registration number is useful when contacting EPA for information or when calling the National Pesticide Telecommunications Network hotline (see page 29). Pesticide labels may differ from one state to another based on area-specific considerations. Also, different formulations of the same active ingredients may result in different label information. The pesticide label lists information only for active ingredients (not for inert components) and rarely contains information on chronic health effects (e.g., cancer and neurologic, reproductive, and respiratory diseases).[6] Although further pesticide information is often needed, these documents should be considered as the first step in identifying and understanding the health effects of a given pesticide.

For the agricultural worker patient, the health care provider has two legal bases — the EPA Worker Protection Standard and USDA regulations under the 1990 Farm Bill — for obtaining from the employer the pesticide product name to which the patient was exposed. When requesting this information, the clinician should keep the patient's name confidential whenever possible.

Assessing the Relationship of Work or Environment to Disease

Because pesticides and other chemical and physical hazards are often associated with nonspecific medical complaints, it is very important to link the review of systems with the timing of suspected exposure to the hazardous agent. The Index of Signs and Symptoms in Section V provides a quick reference to symptoms and medical conditions associated with specific pesticides. Further details on the toxicology, confirmatory tests, and treatment of illnesses related to pesticides are provided in each chapter of this manual. A general understanding of pesticide classes and some of the more common agents is helpful in making a pesticide related disease diagnoses.

In evaluating the association of a given pesticide exposure in the workplace or environment and a clinical condition, key factors to consider are:

- Symptoms and physical signs appropriate for the pesticide being considered

- Co-workers or others in the environment who are ill
- Timing of the problems
- Confirmation of physical exposure to the pesticide
- Environmental monitoring data
- Biomonitoring results
- Biological plausibility of the resulting health effect
- Ruling out non-pesticide exposures or pre-existing illnesses.

A concurrent non-pesticide exposure can either have no health effect, exacerbate an existing pesticide health effect, or solely cause the health effect in a patient. In the more complicated exposure scenarios, assistance should be sought from specialists in occupational and environmental health (see Information Resources on page 27).

Legal, Ethical, and Public Health Considerations

Following are some considerations related to government regulation of pesticides, ethical factors, and public health concerns that health care providers should be aware of in assessing a possible pesticide exposure.

Reporting Requirements

When evaluating a patient with a pesticide-related medical condition, it is important to understand the state-specific reporting requirements for the workers' compensation system (if there has been an occupational exposure) or surveillance system. Reporting a workers' compensation case can have significant implications for the worker being evaluated. If the clinician is not familiar with this system or is uncomfortable evaluating work-related health events, it is important to seek an occupational medicine consultation or make an appropriate referral.

At least six states have surveillance systems within their state health departments that cover both occupational and environmental pesticide poisonings: California, Florida, New York, Oregon, Texas, and Washington. These surveillance systems collect case reports on pesticide-related illness and injury from clinicians and other sources; conduct selected interviews, field investigations, and research projects; and function as a resource for pesticide information within their state. In some states, as noted earlier, pesticide case reporting is legally mandated.

Regulatory Agencies

Since its formation in 1970, EPA has been the lead agency for the regulation of pesticide use under the Federal Insecticide, Fungicide and Rodenticide Act. EPA's mandates include the registration of all pesticides used in the United States, setting restricted entry intervals, specification and approval of label in-

formation, and setting acceptable food and water tolerance levels. In addition, EPA works in partnership with state and tribal agencies to implement two field programs — the certification and training program for pesticide applicators and the agricultural worker protection standard — to protect workers and handlers from pesticide exposures. EPA sets national standards for certification of over 1 million private and commercial pesticide applicators.

The authority to enforce EPA regulations is delegated to the states. For example, calls concerning non-compliance with the worker protection standard can typically be made to the state agricultural department. In five states, the department of the environment or other state agency has enforcement authority. Anonymous calls can be made if workers anticipate possible retaliatory action by management. It should be noted that not all state departments of agriculture have similar regulations. In California, for instance, employers are required to obtain medical supervision and biological monitoring of agricultural workers who apply pesticides containing cholinesterase-inhibiting compounds. This requirement is not found in the federal regulations.

Outside the agricultural setting, the Occupational Safety and Health Administration (OSHA) has jurisdiction over workplace exposures. All workers involved in pesticide manufacturing would be covered by OSHA. OSHA sets permissible exposure levels for selected pesticides. Approximately half the states are covered by the federal OSHA; the rest have their own state-plan OSHA. Individual state plans may choose to be more protective in setting their workplace standards. Anonymous calls can also be made to either state-plan or federal OSHA agencies.

For pesticide contamination in water, EPA sets enforceable maximum containment levels. In food and drug-related outbreaks, EPA works jointly with the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) to monitor and regulate pesticide residues and their metabolites. Tolerance limits are established for many pesticides and their metabolites in raw agricultural commodities.

In evaluating a patient with pesticide exposure, the clinician may need to report a pesticide intoxication to the appropriate health and/or regulatory agency.

Worker Protection Standard

EPA's Worker Protection Standard (WPS) became fully effective in 1995. The intent of the regulation is to eliminate or reduce pesticide exposure, mitigate exposures that occur, and inform agricultural workers about the hazards of pesticides. The WPS applies to two types of workers in the farm, greenhouse, nursery, and forest industries: (1) agricultural pesticide handlers (mixer, loader, applicator, equipment cleaner or repair person, and flagger), and (2) field workers (cultivator or harvester).

The WPS includes requirements that agricultural employers notify workers about pesticide treatments in advance, offer basic pesticide safety training, provide

personal protective equipment for direct work with pesticides, and observe restricted entry interval (REI) times. (The REI is a required waiting period before workers can return to areas treated with pesticides.) Of special interest to health care providers, the WPS also requires agricultural employers to:

- Post an emergency medical facility address and phone number in a central location.
- Arrange immediate transport from the agricultural establishment to a medical facility for a pesticide-affected worker.
- Supply the affected worker and medical personnel with product name, EPA registration number, active ingredient, label medical information, a description of how the pesticide was used, and exposure information.

Ethical Considerations

Attempts to investigate an occupational pesticide exposure may call for obtaining further information from the worksite manager or owner. Any contact with the worksite should be taken in consultation with the patient because of the potential for retaliatory actions (such as loss of job or pay cuts). Ideally, a request for a workplace visit or more information about pesticide exposure at the workplace will occur with the patient's agreement. In situations where the health hazard is substantial and many individuals might be affected, a call to a state pesticide surveillance system (if available), agricultural health and safety center (if nearby), can provide the National Institute for Occupational Safety and Health (NIOSH) or state agricultural agency the assistance needed for a disease outbreak investigation.

Similarly, the discovery of pesticide contamination in a residence, school, daycare setting, food product, or other environmental site or product can have public health, financial, and legal consequences for the patient and other individuals (e.g., building owner, school district, food producer). It is prudent to discuss these situations and follow-up options with the patient as well as a knowledgeable environmental health specialist and appropriate state or local agencies.

Public Health Considerations

Health care providers are often the first to identify a sentinel health event that upon further investigation develops into a full-blown disease outbreak. A disease outbreak is defined as a statistically elevated rate of disease among a well-defined population as compared to a standard population. For example, complaints about infertility problems among workers at a dibromochloropropane (DBCP) manufacturing plant in California led to diagnoses of azoospermia (lack of sperm) or oligospermia (decreased sperm count) among a handful of otherwise healthy young men working at the plant.[7] An eventual disease outbreak investigation resulted in the first published report of a male reproductive toxicant in the workplace. At the time, DBCP was used as a nematocide; it has since been banned in the United States.

Disease outbreak investigations are conducted for all kinds of exposures

and health events, not only those in the occupational and environmental area. Usually, assistance from government or university experts is needed in the investigation, which may require access to information, expertise, and resources beyond that available to the average clinician. The steps involved in such an investigation and the types of information typically gathered in the preliminary clinical stages are outlined below. The clinician must be aware that an outbreak investigation may be needed when a severe and widespread exposure and disease scenario exists. For more information on disease outbreak investigations, consult the literature.[8, 9]

STEPS IN INVESTIGATING A DISEASE OUTBREAK

- Confirm diagnosis of initial case reports (the "index" cases)
- Identify other unrecognized cases
- Establish a case definition
- Characterize cases by person, place, and time characteristics (e.g., age, race, ethnicity, gender, location within a company or a neighborhood, timeline of exposure and health events)
- Create plot of case incidence by time (an epidemic curve)
- Determine if a dose-response relationship exists (i.e., more severe clinical case presentation for individuals with higher exposures)
- Derive an attack rate and determine if statistical significance is achieved (divide number of incident cases by number of exposed individuals and multiply by 100 to obtain attack rate percentage)

Information Resources

Government Agencies:

EPA Office of Pesticide Programs
Overall pesticide regulation with special programs on agricultural workers and pesticide applicators. Specific programs include the promotion of the reduction of pesticide use, establishment of tolerance levels for food, and investigation of pesticide releases and exposure events.

Address: EPA – Office of Pesticide Programs
401 M Street SW (7501C)
Washington, DC 20460
Telephone: 703-305-7090
Web site: www.epa.gov/pesticides

EPA – Certification and Worker Protection Branch
Within the Office of Pesticide Programs, the Certification and Worker Protection Branch addresses worker-related pesticide issues and pesticide applicator certification activities. Special emphasis is placed on the adequate training of farm workers, pesticide applicators, and health care providers. Various training

materials in several languages are available.

Address: EPA – OPP
401 M Street SW (7506C)
Washington, DC 20460
Telephone: 703-305-7666
Web site: www.epa.gov/pesticides/safety

Occupational Safety and Health Administration (OSHA)
More than 100 million workers and 6.5 million employers are covered under the Occupational Safety and Health Act, which covers workers in pesticide manufacturing as well as other industries. OSHA and its state partners have approximately 2100 inspectors, plus investigators, standards writers, educators, physicians, and other staff in over 200 offices across the country. OSHA sets protective workplace standards, enforces the standards, and offers employers and employees technical assistance and consultation programs. Note that some states have their own OSHA plan.

Address: OSHA – US DOL
Room N3647
Constitution Ave NW
Washington, DC 20210
Telephone: 202-219-8021
Web site: www.osha.gov

Food and Drug Administration (FDA)
Drug and food pesticide issues.
Address: FDA
National Center for Toxicological Research
5600 Fishers Lane
Rockville, MD 20857
Telephone: 301-443-3170
Internet: gopher.nctr.fda.gov

USDA Extension Service
USDA's Extension Service works with its university partners, the state land-grant system, to provide farmers and ranchers information to reduce and prevent agricultural-related work incidents. The Pesticide Applicator Training program trains applicators in the safe use of pesticides and coordinates pesticide-related safety training programs.

Address: USDA
14th & Independence SW
Washington, DC 20250
Telephone: 202-720-2791
Web site: www.reeusda.gov

National Center for Environmental Health (NCEH), Centers for Disease Control (CDC)

NCEH provides expertise in environmental pesticide case surveillance and disease outbreak investigations.

Address: NCEH, CDC
Mailstop F29
4770 Buford Highway NE
Atlanta, GA 30341
Tel: 770-488-7030
Web site: www.cdc.gov/nceh/ncehhome.htm

National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control (CDC)

NIOSH is the federal agency responsible for conducting research on occupational disease and injury. NIOSH may investigate potentially hazardous working conditions upon request, makes recommendations on preventing workplace disease and injury, and provides training to occupational safety and health professionals.

Address: NIOSH
Humphrey Building, Room 715H
200 Independence Ave SW
Washington, DC 20201
Hotline: 1-800-356-4674
Web site: www.cdc.gov/niosh/homepage.html

NIOSH Agricultural Health and Safety Centers

NIOSH has funded eight Agricultural Health and Safety Centers throughout the country which involve clinicians and other health specialists in the area of pesticide-related illness and injury. The NIOSH-supported centers are:

University of California Agricultural Health and Safety Center
Old Davis Road
University of California
Davis, CA 95616
Tel: 916-752-4050

High Plains Intermountain Center for Agricultural Health and Safety
Colorado State University
Fort Collins, CO 80523
Tel: 970-491-6152

Great Plains Center for Agricultural Health
University of Iowa
Iowa City, IA 52242
Tel: 319-335-4415

Southeast Center for Agricultural Health and Injury Prevention
University of Kentucky
Department of Preventive Medicine
Lexington, KY 40536
Tel: 606-323-6836

Northeast Center for Agricultural and Occupational Health
One Atwell Road
Cooperstown, NY 13326
Tel: 607-547-6023

Southwest Center for Agricultural Health, Injury and Education
University of Texas
Health Center at Tyler
PO Box 2003
Tyler, TX 75710
Tel: 903-877-5896

Pacific Northwest Agricultural Safety and Health Center
University of Washington
Department of Environmental Health
Seattle, WA 98195
Tel: 206-543-0916

Midwest Center for Agricultural Research, Education and Disease and Injury Prevention
National Farm Medicine Center
Marshfield, WI 54449-5790
Tel: 715-389-3415

Non-Governmental Organizations:

National Pesticide Telecommunications Network

The National Pesticide Telecommunications Network (NPTN) is based at Oregon State University and is cooperatively sponsored by the University and EPA. NPTN serves as a source of objective, science-based pesticide information on a wide range of pesticide-related topics, such as recognition and management of pesticide poisonings, safety information, health and environmental effects, referrals for investigation of pesticide incidents and emergency treatment for both humans and animals, and cleanup and disposal procedures.

A toll-free telephone service provides pesticide information to callers in the continental United States, Puerto Rico, and the Virgin Islands. Additionally, pesticide questions and comments can be sent to an e-mail address. The Web site has links to other sites and databases for further information.

NPTN hotline:	1-800-858-7378
Hours of operation:	9:30 am – 7:30 pm E.S.T. daily except holidays
Web site:	http://ace.orst.edu/info/nptn/
E-mail address:	nptn@ace.orst.edu

Farmworker Justice Fund

The Farmworker Justice Fund can provide an appropriate referral to a network of legal services and nonprofit groups which represent farmworkers for free.

Address:	Farmworker Justice Fund 1111 19th Street, NW, Suite 1000 Washington, DC 20036
Telephone:	202-776-1757
E-mail address:	fjf@nclr.org

American Farm Bureau Federation
The AFBF is the nation's largest general farm organization. Information on how to contact individual state-based farm bureaus is available on their Web site.

Web site: www.fb.com

Association of Occupational and Environmental Clinics (AOEC)
This association is a network of 63 clinics representing more than 250 specialists.

Address: AOEC
1010 Vermont Ave, NW, Suite 513
Washington, DC 20005
Telephone: 202-347-4976
Web site: http://152.3.65.120/oem/aoec.htm

Poison Control Centers
For a list of state and regional poison control centers, or the nearest location, consult the NPTN Web site (http://ace.orst.edu/info/nptn).

Pesticide Information Databases:

Extension Toxicology Network (EXTOXNET)
http://ace.ace.orst.edu/info/extoxnet
The Extension Service's Toxicology Network, EXTOXNET, provides science-based information about pesticides to health care providers treating pesticide-related health concerns. Pesticide toxicological information is developed cooperatively by the University of California-Davis, Oregon State University, Michigan State University, Cornell University, and the University of Idaho.

IRIS
www.epa.gov/ngispgm3/iris
The Integrated Risk Information System – IRIS – is an electronic database, maintained by EPA, on human health effects that may result from exposure to various chemicals in the environment. IRIS is intended for those without extensive training in toxicology, but with some knowledge of health sciences. It provides hazard identification and dose-response assessment information. Combined with specific exposure information, the data in IRIS can be used for characterization of the public health risks of a chemical in a particular situation that can lead to a risk management decision designed to protect public health. Extensive supporting documentation available online.

Agency for Toxic Substances and Disease Registry
http://atsdr1.atsdr.cdc.gov:8080/toxfaq.html
ATSDR (part of the Department of Human Health and Services) publishes fact sheets and other information on pesticides and other toxic substances.

California Pesticide Databases
http://www.cdpr.ca.gov/docs/database/database.htm
Includes Pesticidal Chemical Ingredients Queries, links to EPA's Officeof Pesticide Programs chemical dictionary, Product/Label Database Queries (updated nightly), a current listing of California's Section 18 Emergency Exemptions, and more.

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