

Farmworker Health and Safety Institute

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Health Provider Training in Evaluation of Pesticide Exposure of Farmworkers

Trainer's Guide

January, 1994

Farmworker Justice Fund, Inc.

CATA:
Farmworker Support Committee

George Washington School
of Medicine,
Division of Occupational and
Environmental Medicine

Farmworker Association of
Central Florida

Trainer's Guide

for

Health Provider Training in Evaluation of Pesticide Exposure of Farmworkers

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County Migrant Health Center
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This guide was produced by

The Farmworker Health and Safety Institute

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The Farmworker Health and Institute trains health providers in the evaluation of pesticide exposure of farmworkers. The Institute also trains health providers to be trainers of other clinicians, and uses this manual as the trainer's guide. This **Trainer's Guide** is keyed to the **Health Provider Guide, Evaluation of Pesticide Exposure of Farmworkers**, which is produced by the Institute, and to the U. S. Environmental Protection Agency Manual, **Recognition and Management of Pesticide Poisonings**, 4th edition.

The original version of this **Trainer's Guide** was produced with funds provided by the New Jersey Department of Health and the Rutgers University Labor Education Center. It was revised in 1994 with funds provided by the Kellogg Foundation and the United States Environmental Protection Agency, and is produced with the permission of the New Jersey Department of Health.

Health Provider Training in Evaluation of Pesticide Exposure of Farmworkers Trainer's Guide

A. Introduction:

1. Trainer introduce her/himself: experience working with farmworkers, knowledge of pesticides, training of farmworkers and health providers, health background.
2. Why is it important to train health providers about farmworker pesticide exposure to farmworkers? A chart audit was done of 150 charts from seven migrant health clinics. The audits looked at charts of known farmworkers whose diagnosis was skin rash, gastro-intestinal problems (diarrhea, vomiting, nausea, sometimes with a diagnosis such as gastroenteritis or food poisoning) or headaches. These symptoms are also common symptoms of mild acute pesticide poisoning. **Less than 8% of the clinicians documented on their charts that they had inquired if the farmworker had recently been exposed to pesticides.** Thus, over 90% of the time clinicians did not include pesticide exposure in the differential diagnosis of symptoms commonly related to pesticide poisoning, when it should have been included.

2. Purpose of this training:

- * This is a basic training, which focuses on recognition of pesticide poisoning, and especially focuses on using the occupational health history to rule-in or rule-out pesticide exposure as the possible cause of the presenting problem.
- * The training will go through the clinical decision making process, including obtaining an appropriate occupational history, physical exam, laboratory evaluation and treatment.
- * You will learn how to use resources in your state and community to obtain information you need about pesticides.
- * We will discuss the laws which are in place to protect farmworkers from pesticides, which make it easier for you to get the information you need to evaluate farmworkers with possible pesticide poisoning.
- * We will discuss the unique role of health providers, who are one of the few community institutions accessible to migrant farmworkers.
- * We will present a tool which health providers can use to evaluate the quality of their care of farmworkers with possible pesticide exposure.

Introduction, continued.

3. Hand out materials which will be used in the workshop.

- * Health Provider Guide to Evaluation of Pesticide Exposure of Farmworkers.

- * Recognition and Management of Pesticide Poisonings, by the U.S. Environmental Protection Agency.

- * The packet of handouts: case history and discussion questions, pesticide evaluation form, lab results for ChE test, migrant clinic board meeting role-play, resource check list.

B. Case History:

1. Introduce case history of Hector Martinez. Participants read case history, found on page 1 of handouts, before discussion.

2. Review case history and questions, using this guide (pages 5 and following presents a detailed discussion of the questions).

C. Role-Play (time permitting):

Purpose of role-play: Migrant clinics are often one of the few institutions in the communities to which farmworkers have access. If farmworkers rights (such as field sanitation) are being violated, what should be the role of clinics in informing farmworkers of their rights, and how to exercise them? Is this preventive education or advocacy? Exactly what is the role of migrant clinics concerning health and safety issues? This role-play has no "correct" answer, but rather opens up the discussion of these issues. (Often there is not enough time to do this role-play, as part of the training which includes the case history, above. If there is not enough time, consider doing the role play at another time.)

1. Choose 5 participants to read characters of the role-play, found on page 6 of handouts: "Board Meeting, Armitage County Migrant Health Center".

2. Discussion questions, after role-play is read:

- * What are the attitudes of each of the people on the Board.
- * Are these attitudes found in the clinic where you work?
- * Do you agree with their attitudes? Why or why not?
- * How could some of the problems identified in this discussion be resolved?

D. Chart Audit:

1. The chart audit is a tool which health providers can use to evaluate if they are adequately identifying and treating farmworkers who have illnesses or symptoms which may be related to pesticide exposure.
2. Review the **rationale, goal and method** of the pesticide chart audit, as explained on the cover sheet of the audit.
3. This audit may also be used to evaluate the effectiveness of this pesticide training: audit charts of health providers concerning specific diagnoses for patients who were seen before the training, then audit charts of the same providers for the same diagnoses for patients seen after the training; evaluate if the training resulted in more farmworkers being adequately evaluated for possible pesticide exposure

Case History: Pesticide Exposure of a 25 Year Old Farmworker

Hector Martinez, a twenty-five year old Mexican farmworker, was weeding a tomato field at Thompson Bros. Farm when he developed headaches, muscle aches, diarrhea and nausea. Two other workers hoeing in the same area also said they "felt sick". He thought he had the flu, but decided to work until the end of the day. After returning to the camp, he began to vomit and feel dizzy, and also noticed a rash on his hands and arms. He then decided to come to the local migrant clinic, but had to wait two hours before he could get a ride from a friend.

A co-worker mentioned that the tomatoes had been sprayed with something that morning, but Mr. Martinez did not ask the foreman if or what type of pesticide was being used, or what the re-entry time was, because he was afraid he would be branded a troublemaker.

The attending physician at the clinic asked Mr. Martinez if he knew if a pesticide had been used, and he was not sure. Also, when questioned, the patient said he wore a short-sleeved shirt in the fields because it was hot, and did not wear gloves because they were uncomfortable. He had no training on the farm about protective clothing, nor about the hazards or symptoms of pesticide poisoning.

Mental status exam revealed mild confusion and slowness to respond to questions. He also had an erythematous macular-papular rash on his hands and forearms. PE was otherwise normal.

Discussion of Case History: Pesticide Exposure of 25 Year Old Farmworker

1. What problems can you identify in this story, and how are they perceived by the farmworker and the attending physician? Do you find similar problems where you work?
2. Do you think the farmworker is justified in being afraid to ask the farmer for information?
3. Which symptoms did Mr. Martinez have?
4. What common diseases present with symptoms similar to those which Mr. Martinez had?
5. What information in the history makes you more suspicious of an occupational exposure as the cause of Mr. Martinez' symptoms?
6. What do you think was the route of exposure of the pesticide?
7. What do you think is the most common route of exposure for pesticide poisoning in farmworkers?
8. How can the health provider find out what pesticide was used?
9. How can you determine if these signs and symptoms could be caused by pesticide exposure?
10. What do you think caused the rash?
11. How do you interpret these lab results? Are you convinced that Mr. Martinez does not have organophosphate poisoning?
12. So, how can you interpret the ChE Inhibition Test, since a "normal" value may in fact indicate pesticide poisoning?
13. How can you use this test, assuming that you determine that organophosphate poisoning occurred?
14. How do you determine the appropriate treatment for this patient?
15. What do you tell Mr. Martinez, to help him prevent further incidents of poisoning or to seek treatment earlier?

Trainer's guide to discussion of case history: Pesticide exposure of a 25 year old farmworker.

1. WHAT PROBLEMS DO YOU SEE IN THIS STORY, AND HOW ARE THEY PERCEIVED BY THE FARMWORKER AND THE ATTENDING PHYSICIAN? (Write answers on flipchart)

Farmworker:

- * No training re. hazards, symptoms, protection.
- * Uses no protective equipment.
- * Does not know if or what pesticide was used.
- * Afraid to ask for information.
- * Had no transportation to hospital.

Physician:

- * Symptoms are non-specific, commonly found in many diseases.
- * Does not know if pesticide was applied, when applied, or it's name.

Problems
(flipchart)

Comments: The new Farmworker Protection Regulations (which will be mostly in affect by the Summer of 1994) will require the following:

- * Farmworkers must receive pesticide training once every five years. If the farmworker has not been trained in the last five years, the farmer must train him or her before he/she has been on the farm for more than 16 days.

- * If a farmworker develops symptoms related to pesticide exposure, the farmer must transport him/her to a clinic or hospital to attain medical attention.

- * The farmer must inform workers of the names of the pesticides applied, exactly when and where applied, and their re-entry time. This information must be posted in a central location, easily accessible to the workers, before the pesticides are applied.

2. DO YOU THINK THE FARMWORKER IS JUSTIFIED IN BEING AFRAID TO ASK THE FARMER FOR INFORMATION? WHY OR WHY NOT? (Group discussion.)

Case History, continued

3. WHICH SYMPTOMS DID MR. MARTINEZ HAVE?

(Write answers on flip chart, labeled "symptoms/ differential diagnosis, below.)

4. WHAT COMMON DISEASES PRESENT WITH SYMPTOMS SIMILAR TO THOSE WHICH MR. MARTINEZ HAD?

(write answers on flipchart labeled "symptoms/differential diagnosis, below.)

Symptoms	differential diagnosis
GI. nausea vomiting diarrhea	acute gastroenteritis influenza food poisoning alcohol intoxication
CNS: dizziness headaches confusion	heat-related disorders alcohol intoxication seizure disorder diabetes
muscle aches	viral syndrome/influenza heat-related disorders physical work
rash on hands and arms	all causes of allergic and contact dermatitis

Comments:

* If we only look at common diseases which can cause the symptoms which Mr. Martinez presented with, it is clear that the differential diagnosis is very complicated. This is compounded by the fact that many of the diseases in the differential diagnosis are very prevalent in the farmworker community: Farmworkers have 20X the national average of diarrheal diseases; 3X the average for heat-related disorders (highest occupational group, even higher than miners and construction workers); food-poisoning is common in communal living situations; and alcoholism is an epidemic among farmworkers.

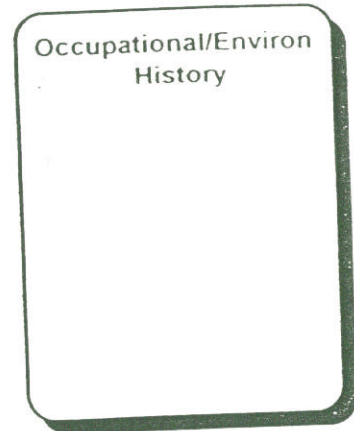
*** Acute alcohol intoxication, influenza and acute gastroenteritis are the most common mis-diagnoses of farmworkers with pesticide poisoning.**

* The symptoms and signs listed on the "Migrant Clinicians Network Evaluation of Farmworker Pesticide Exposure" (page 3 of your handouts) are also associated with pesticide poisoning.

Case History, continued

5. WHAT INFORMATION IN THE HISTORY MAKES YOU MORE SUSPICIOUS OF AN OCCUPATIONAL EXPOSURE AS THE CAUSE OF MR. MARTINEZ' SYMPTOMS?
(Write answers on flipchart titled "Occupational/Environmental History".)

- * Field in which worked was probably recently sprayed (probable offending chemical).
- * Symptoms developed shortly after exposure (acute pesticide poisoning occurs within minutes to 12 hours after exposure).
- * Other workers in area, with same exposure, developed symptoms.
- * Rash on area exposed to environment.



6. WHAT DO YOU THINK WAS THE ROUTE OF EXPOSURE OF THE PESTICIDE?

- * Dermal, being exposed to the residues of the pesticides in the field

7. WHAT DO YOU THINK IS THE MOST COMMON ROUTE OF EXPOSURE FOR PESTICIDE POISONING IN FARMWORKERS?

- * Dermal exposure accounts for 90-95% of all acute pesticide poisonings. 40% of physician-diagnosed acute pesticide poisonings occur through exposure to pesticide residues when farmworkers are in the fields after the re-entry interval has expired.

Comment : For more detailed information concerning the occupational history of farmworker exposure to pesticides, see SECTION 1 of the GUIDE provided to you.

Case history, continued

8. HOW CAN THE HEALTH PROVIDER FIND OUT WHAT PESTICIDE WAS USED?

- * The Worker Protection Regulations issued by EPA in 1992 require the farmer to provide specific pesticide information to either health providers or the farmworker. Call the grower and request information about the specific pesticide that was applied on a specific date on a specific field.

Suggestion: Each clinic or ER should maintain a list of names, addresses and phone numbers of farms in the area. Often the farmworker will not know the exact address of the farm or telephone number

- * If the farmworker calls the clinic or ER and says she may have been poisoned by pesticides, ask her to at least get the name of the pesticide used in the field where she was working. The name of the pesticide and the field where applied should be posted before the pesticide was applied, according to EPA regulations. This information must be displayed for at least 30 days after the expiration of the re-entry time

Comment: For more detailed discussion concerning how to identify the pesticide, see Section II of the GUIDE, "Identifying the Pesticide".

9. HOW CAN YOU DETERMINE IF THESE SIGNS AND SYMPTOMS COULD BE CAUSED BY PESTICIDE EXPOSURE?

Scenario 1: Pesticide name obtained from farmworker or farmowner:

Cross-reference brand or chemical name in the Index of the EPA MANUAL, pp. 169 ff. The Index will then refer you to the appropriate chapter, which is organized according to the class of pesticides.

For example: Look up "Guthion" in the Index. You are referred to Chapter 1, "Organophosphates". (Turn to Chapter 1 and review its contents.)

Each chapter contains the following essential information:

- * **Commercial Products:** gives the brand and chemical names in that class, and lists relative toxicity.

- * **Toxicology:** describes pathophysiology of poisoning, routes of entry, acute and chronic target organ damage.

- * **Symptoms and signs of poisoning:** describes acute findings on history and physical examination.

Case history, continued

Scenario 2: Pesticide name not known:

Refer to pp. 159-168 of the EPA MANUAL, which indexes signs and symptoms caused by different classes of pesticides. The pesticides are listed by brand and chemical name. The pesticides can then be cross-referenced in the Index (pp. 169-207) of the same EPA MANUAL, which then refers the reader to the appropriate chapter.

For example: Take Mr. Martinez' symptom of headaches. If you look under "headaches" on page 163 of the EPA MANUAL, you will find several pesticides which can cause this symptom. **Organophosphates** are one of the pesticides listed as a cause of headaches. Go to chapter 1, "Organophosphates", and look under the section, "Symptoms and Signs of Poisoning". This section, besides headaches, also lists many of the other symptoms which Mr. Martinez had (nausea, vomiting, diarrhea, confusion, muscle pain, rash.) Thus an organophosphate should be considered a possible cause of Mr. Martinez' symptoms.

Scenario 3: Pesticide name obtained, but brand or chemical name not found in Index of EPA MANUAL.

Call your regional Poison Control Center, which has cross-references for all brand and chemical ~~names~~ of poisons.

10. WHAT DO YOU THINK CAUSED THE RASH?

Dermatitis is the most common occupational disease of farmworkers, and may be caused by allergens or irritants. Plants or chemicals (pesticides, fertilizers, lime, etc.) may cause allergic or irritant dermatitis.

For a detailed discussion of plants and pesticides which cause dermatitis, see Section III of the GUIDE, "Health Effects of Pesticide Poisoning".

Ask group to turn to dermatitis section of Section III: Reviewing this section, in the case of Mr. Martinez, we see that organophosphates may cause a primary irritant or allergic dermatitis; and tomatoes may cause a primary irritant dermatitis.

Comment: Refer to Section III of the GUIDE, "Health Effects of Pesticide Poisoning". This section provides information about:

- * Resources for determining health effects of pesticides
- * Dermatitis
- * Chronic health effects, including cancer and reproductive hazards

It also has two useful summary articles about pesticides.

Case History, continued

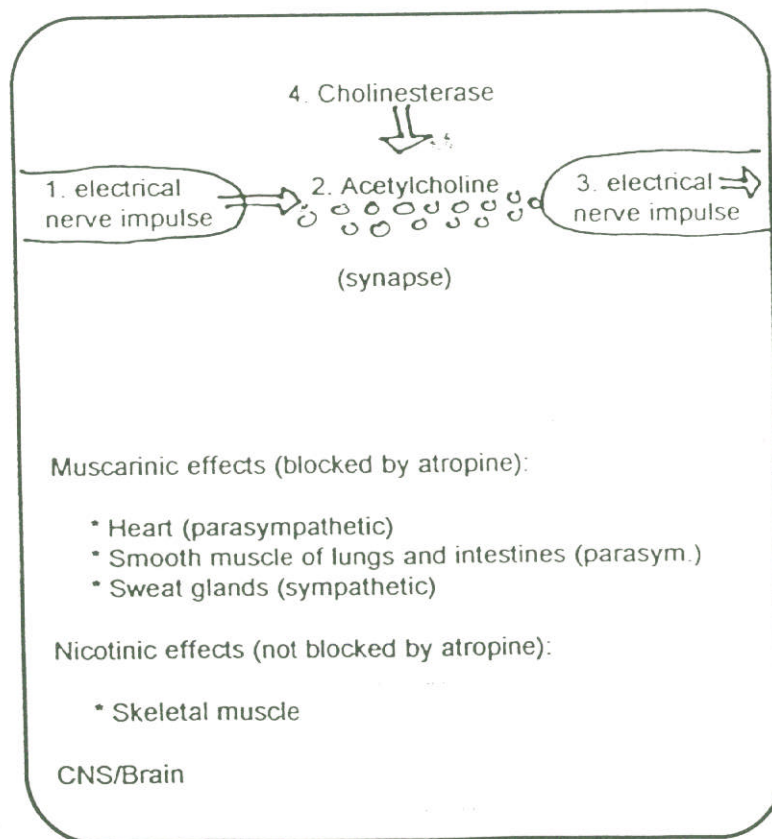
DISCUSSION: TOXICOLOGY OF ACUTE ORGANOPHOSPHATE POISONING.

Introduction: We will look at the toxicology of **organophosphate** poisoning, as one model of how poisoning occurs. Organophosphates are a useful example because:

1. OP's are very commonly used in most sectors of agriculture.
2. OP's are responsible for over 80% of diagnosed acute pesticide poisonings
3. Understanding the toxicology of OP poisoning will enable us to understand the logic behind the **Cholinesterase Inhibition Test**, the most common specific diagnostic study ordered by clinicians to evaluate pesticide poisoning

The targets of organophosphates are specific neuro-synaptic junctions in the somatic and autonomic nervous systems.

1. Diagram of neuro-synaptic junction, and normal transmission of neural impulse (using flipchart):



Case History, continued
Toxicology of OP poisoning

A. Normal neuro-transmission: (refer to flipchart diagram)

1. Electrical impulse travels down pre-synaptic nerve fibre.
2. Reaches neuro-synaptic junction, transported across junction by chemical neuro-transmitter. There are several neuro-transmitters: Acetylcholine (ACTH) is the neuro-transmitter affected by organophosphates.
3. The neural impulse continues down the post-synaptic fibre as an electrical impulse.
4. The action of the chemical transmitter is inhibited by an enzyme (in this case ACTH action is inhibited by Acetylcholinesterase, or ChE)

B. Neuro-transmission when OP Poisoning occurs:

OP's bind up the Cholinesterase, and thus stop its ability to inhibit the action of ACTH, Thus:

1. Chemical impulse travels down pre-synaptic nerve fibre.
2. Transported across neuro-synaptic junction by ACTH
3. Cholinesterase bound up by OP, and cannot inhibit action of ACTH
4. Thus, the nervous impulse continues to be transmitted across the synapse, and the affected nerves continue to fire.

C. Target systems affected by continued firing of nerves normally inhibited by ACTH: (Refer to flipchart, previous page)

1. **Heart:** bradycardia, decreased BP, dizziness, loss of consciousness
2. **GI:** spasm of smooth muscle of intestines, abdominal pain, nausea, vomiting, diarrhea.
3. **Lungs:** bronchospasm, increased bronchial secretions, productive cough, shortness of breath, pulmonary edema, ultimately respiratory failure.
4. **Skeletal muscle:** over-stimulation of muscles at first produces fasciculations, then fatigue, then paralysis.
5. **Central Nervous System:** confusion, loss of consciousness, convulsions, psychosis, visual problems, miosis, respiratory center depression.
6. **General:** excessive sweating, drooling, tearing.

The most common cause of death is **respiratory failure**, caused by bronchospasm, pulmonary edema, paralysis of the muscles of respiration, and depression of the respiratory center.

Case History, continued
Toxicology of OP Poisoning

Comment: See Pesticide Occupational History Form (Handout, page 3) which reviews the signs and symptoms of pesticide poisoning.

11. (Refer participants to page 4 of Handout, ChE lab report for Mr. Martinez)
HOW DO YOU INTERPRET THESE RESULTS? ARE YOU CONVINCED THAT MR. MARTINEZ DOES NOT HAVE ORGANOPHOSPHATE POISONING?

Discussion:

* The range of "normal" for plasma or RBC ChE is very wide-- the upper limit of normal may be 200% greater than the lower limit of normal. Thus, a patient who has a high normal baseline may have ChE activity depressed 50% by organophosphate poisoning and still have ChE values "within normal limits"
(See flipchart)

Hector Martinez ChE
Top normal: <u>1.24 units</u>
H.M. <u>0.70 units</u>
Low normal: <u>0.53 units</u>

* However, if the patient's normal baseline ChE activity is depressed 25% or more, it is indicative of OP poisoning, because at that point target-organ damage begins to occur. Patients usually do not develop symptoms until the ChE level is depressed 50%.

* For example, Mr. Martinez may have a baseline ChE of 100 units, with a post-exposure ChE of 70 units. His post-exposure ChE is "within normal limits", but represents a 30% decrease from his baseline value. Thus, he should be diagnosed with OP poisoning.

Case History, continued

12. SO, HOW CAN YOU INTERPRET THE ChE TEST, SINCE A "NORMAL" VALUE MAY IN FACT INDICATE PESTICIDE POISONING?

The ChE test performed one time is seldom useful without the patient's **baseline** for comparison. The baseline can be determined in two ways:

- * Obtain a pre-exposure baseline level for the patient, which would determine what is "normal" for that person (rarely done).
- * Do **serial ChE analysis** to determine if the "normal" for that patient is significantly higher than the immediate post-exposure test.

Serial ChE analysis is done by repeating the ChE test every three days until the values level off to within 10% of each other (this happens within 10 days if the plasma ChE is done, within 3 weeks if the RBC ChE is done).

If the original post-exposure ChE is 25% lower than the "baseline" where the values level off, OP poisoning is considered to have occurred

(See article by Coye, et.al., in Section IV of the GUIDE.)

13. HOW CAN YOU USE THIS TEST, ASSUMING THAT YOU DETERMINE THAT ORGANOPHOSPHATE POISONING HAS OCCURRED?

IMPORTANT: In an emergency diagnostic tests such as the ChE are not useful, because the results cannot be obtained immediately. You must therefore use your clinical judgement. The ChE test can be used for the following reasons:

- * Documenting that pesticide poisoning has occurred, for public health reasons, substantiating reports to state agencies for follow-up.
- * Doing preventive education with the patient may be more effective, if there is objective evidence ("a test") that poisoning has occurred.
- * Advising the patient when to return to work. A patient who has ChE inhibition is more susceptible to poisoning (target organ damage) if he/she is re-exposed to ChE inhibitors (OP's and carbamates) at work.

If OP poisoning is suspected, advise the patient to not return to work until the ChE tests have stabilized (returned to baseline); or patient should not work where he/she may be exposed to OP's or carbamates.

Case History, continued
Question # 13

Comment: Refer to Section IV of the GUIDE, "Diagnostic Studies in Evaluating Pesticide Exposure", which contains the following information:

- * Uses of diagnostic studies.
- * Types of diagnostic studies.
- * The Cholinesterase Inhibition Test, and an article by Coye, et al., re. serial ChE testing.
- * Discussion of urinary metabolites.

14. HOW DO YOU DETERMINE THE APPROPRIATE TREATMENT FOR THIS PATIENT?

We are not going to discuss treatment in detail today. Refer to Section V of the GUIDE, and the "Treatment" section under each chapter of the EPA MANUAL.

Section V of the GUIDE contains the following

- * Steps in emergency treatment.
- * Outline of the contents of a "Pesticide Treatment Kit", which lists medications and equipment necessary to treat pesticide poisoning.
Important: This kit contains a drug which is not usually found on an emergency "crash cart"— Pralidoxime Chloride IV (2-PAM), which effectively reverses OP inhibition of ChE. Emergency rooms and migrant clinics should have this drug on hand.
- * Reference to the EPA MANUAL sections which detail treatment of specific pesticide poisonings as well as general and supportive therapy.
- * Discussion of treatment of dermatitis and eye contamination with pesticides.

Case History, continued

15. WHAT DO YOU TELL MR. MARTINEZ, TO HELP HIM PREVENT FURTHER INCIDENTS OF POISONING OR TO SEEK TREATMENT EARLIER:

- * **Review symptoms of pesticide poisoning**, advise him to leave the field immediately and seek medical attention if he develops symptoms.
- * **Personal protective equipment:** wear long sleeve shirts, gloves, long pants, boots, hat.
- * **Wash hands**, before eating, drinking, smoking, going to bathroom, and after leaving the field. Farmworkers have a legal right to handwashing facilities with disposable towels and soap within 1/4 mile of the area in which they work.
- * **Never work in a field in which the pesticides are still wet**, or before the re-entry time for the pesticide has passed.
- * **At the end of the day**, take a shower and wash work clothes.
- * **First aid**, if develops symptoms or is sprayed: wash affected skin immediately, remove clothes, take a shower, put on clean clothes. Go to a doctor.
- * **Farmworkers who mix or apply pesticides** are required to receive special training and use special protective equipment.
- * **Bring the name of the pesticide to the doctor**, if you get sick or are sprayed. The farmer is required to post this information in a central location accessible to the workers, before the pesticide is applied.
- * **The farmer must bring the farmworker to the doctor**, if he or she develops an illness which may be related to pesticide exposure.

Health Provider Training in Evaluation of Pesticide Exposure of Farmworkers

Handouts

Agenda

1. Case History: Pesticide Exposure of 25 Year Old Farmworker.
2. Case discussion questions.
3. Migrant Clinicians Network Occupational History: Evaluation of Farmworker Pesticide Exposure (Spanis and English versions)
4. Lab results for Plasma Cholinesterase for Hector Martinez.
5. Chart Audit: Farmworker with possible pesticide exposure.
6. Board Meeting, Armitage County Migrant Health Center.
7. State and regional pesticide resources.
8. Workshop evaluation form.

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Health Provider Training in Evaluation of Pesticide Exposure in Farmworkers

Agenda

Introduction

Case History: Pesticide Exposure of a
25 Year Old Farmworker

Board Meeting: Armitage County Migrant
Health Center

Chart Audit: Farmworker with Possible
Pesticide Poisoning

Workshop Evaluation

Farmworker Justice Fund, Inc.

CATA:
Farmworker Support Committee

George Washington School
of Medicine,
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Case History: Pesticide Exposure of a 25 Year Old Farmworker

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A co-worker mentioned that the tomatoes had been sprayed with something that morning, but Mr. Martinez did not ask the foreman if or what type of pesticide was being used, or what the re-entry time was, because he was afraid he would be branded a troublemaker.

The attending physician at the clinic asked Mr. Martinez if he knew if a pesticide had been used, and he was not sure. Also, when questioned, the patient said he wore a short-sleeved shirt in the fields because it was hot, and did not wear gloves because they were uncomfortable. He had no training on the farm about protective clothing, nor about the hazards or symptoms of pesticide poisoning.

Mental status exam revealed mild confusion and slowness to respond to questions. He also had an erythematous macular-papular rash on his hands and forearms. PE was otherwise normal.

Discussion of Case History: Pesticide Exposure of 25 Year Old Farmworker

1. What problems can you identify in this story, and how are they perceived by the farmworker and the attending physician? Do you find similar problems where you work?
2. Do you think the farmworker is justified in being afraid to ask the farmer for information?
3. Which symptoms did Mr. Martinez have?
4. What common diseases present with symptoms similar to those which Mr. Martinez had?
5. What information in the history makes you more suspicious of an occupational exposure as the cause of Mr. Martinez' symptoms?
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MIGRANT CLINICIANS NETWORK

Evaluation of Farmworker Pesticide Exposure

PATIENT ID	Name: _____ DOB: _____ SS#: _____ Farm: _____ Address: _____																				
EXPOSURE INFORMATION	Date of exposure: _____ Last time field sprayed: _____ Name of pesticide: _____ Crop: _____ Method of pesticide application: <input type="checkbox"/> Aerial <input type="checkbox"/> Hand spray <input type="checkbox"/> Spray rig Type of work: <input type="checkbox"/> Mixing <input type="checkbox"/> Loading <input type="checkbox"/> Picking/thinning/pruning crops Exposure: <input type="checkbox"/> Aerial <input type="checkbox"/> Hand spray <input type="checkbox"/> Spray rig <input type="checkbox"/> Sprayed directly <input type="checkbox"/> Drift Other workers involved? <input type="checkbox"/> Yes <input type="checkbox"/> No Who? _____ Had patient received training under the Worker Protection Standard? <input type="checkbox"/> Yes <input type="checkbox"/> No																				
SYMPTOMS	<table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Weakness</td> <td><input type="checkbox"/> Drooling</td> <td><input type="checkbox"/> Blurred vision</td> <td><input type="checkbox"/> Chest pain</td> </tr> <tr> <td><input type="checkbox"/> Skin rash</td> <td><input type="checkbox"/> Tiredness</td> <td><input type="checkbox"/> Excessive sweating</td> <td><input type="checkbox"/> Red eyes</td> </tr> <tr> <td><input type="checkbox"/> Headaches</td> <td><input type="checkbox"/> Nausea</td> <td><input type="checkbox"/> Loss of consciousness</td> <td><input type="checkbox"/> Convulsions</td> </tr> <tr> <td><input type="checkbox"/> Shortness of breath</td> <td><input type="checkbox"/> Dizziness</td> <td><input type="checkbox"/> Vomiting</td> <td><input type="checkbox"/> Abdominal pain</td> </tr> <tr> <td><input type="checkbox"/> Muscle twitches</td> <td><input type="checkbox"/> Productive cough</td> <td><input type="checkbox"/> Confusion</td> <td><input type="checkbox"/> Other: _____</td> </tr> </table> How long after exposure did symptoms occur? _____ Other workers exposed who developed symptoms? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Weakness	<input type="checkbox"/> Drooling	<input type="checkbox"/> Blurred vision	<input type="checkbox"/> Chest pain	<input type="checkbox"/> Skin rash	<input type="checkbox"/> Tiredness	<input type="checkbox"/> Excessive sweating	<input type="checkbox"/> Red eyes	<input type="checkbox"/> Headaches	<input type="checkbox"/> Nausea	<input type="checkbox"/> Loss of consciousness	<input type="checkbox"/> Convulsions	<input type="checkbox"/> Shortness of breath	<input type="checkbox"/> Dizziness	<input type="checkbox"/> Vomiting	<input type="checkbox"/> Abdominal pain	<input type="checkbox"/> Muscle twitches	<input type="checkbox"/> Productive cough	<input type="checkbox"/> Confusion	<input type="checkbox"/> Other: _____
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TREATMENT	Atropine? <input type="checkbox"/> Yes <input type="checkbox"/> No Dose: _____ Response: _____ 2-PAM? <input type="checkbox"/> Yes <input type="checkbox"/> No Dose: _____ Response: _____																				
PROVIDER ID	Provider Signature: _____ Date: _____ Address: _____ Phone: _____																				
ABOUT THIS REPORT	The original "Evaluation of Farmworker Pesticide Exposure" was developed by Mark Lyons, MPH, PAC, for the New Jersey Department of Health. This form was adapted by the Migrant Clinicians Network for use in a migrant health center setting and used with permission. This form may be duplicated as needed. For more information, contact MCN at 2512 South IH35, Suite 220, Austin, TX 78704, (512) 447-0770.																				

Dependable Laboratories

Patient: Hector Martinez Perez
Attending Physician: J. Alinski

TEST	RESULTS	NORMAL
Plasma Cholinesterase (Michel method)	0.70 Units	(0.53-1.24 Units)

Chart Audit: Farmworker with Possible Pesticide Poisoning

Rationale for the Chart Audit:

Significant underdiagnosis of acute pesticide poisoning (especially mild poisoning) of farmworkers often occurs, primarily because presenting symptoms are similar to symptoms of other health problems commonly found in the farmworker population. Health providers need to include pesticide poisoning in the differential diagnosis of common symptoms and diseases seen among farmworkers. Obtaining an occupational history is essential in order to rule out pesticide poisoning in farmworkers presenting with these problems.

Goal of the Audit:

To insure that health practitioners obtain an adequate occupational history from all farmworkers presenting with symptoms which may be related to acute pesticide poisoning.

Method:

Seven diagnoses and symptoms which are common to the farmworker population, and which also present with symptoms commonly found in mild-moderate acute pesticide poisoning, are considered for auditing. It is suggested that each provider site choose three of the seven diagnoses/symptoms which are most prevalent in their farmworker population and audit at least twenty charts for each of the three choices. Unless another underlying cause for the diagnosis/symptom is absolutely clear, all farmworkers should be asked if recent pesticide exposure occurred. If recent pesticide exposure may have occurred, an occupational history should be obtained to rule out pesticide poisoning. The chart audit lists the elements of an occupational history to evaluate possible pesticide poisoning.

This chart audit may be used to give health providers feed-back about the quality of their evaluation of farmworkers when acute pesticide poisoning should be included in the differential diagnosis. For health providers who do not obtain an occupational history when it is merited, follow-up chart audits may be done to measure improvement.

The audit may also be used to measure the impact of pesticide training provided to health providers. Provider charts for the chosen diagnoses/symptoms which were evaluated prior to the training could be audited retrospectively (pre-test), and compared to charts for patients with the same diagnoses/symptoms which were evaluated after the training (post-test).

This audit was developed by the Farmworker Health and Safety Institute, 2001 S St., NW, Washington DC 20009. (609) 462-8192. If your health center has participated in an FHSI pesticide training and has done a pre-/post-training chart audit to measure the possible impact of the training, we would greatly appreciate your sharing the results with us.

Chart Audit: Farmworker with Possible Pesticide Poisoning

Health Provider
being audited: _____

Auditor: _____

Date: _____

Chart #: _____

Charts which should be audited: Choose charts with three of the most prevalent following diagnoses or symptoms. Check diagnosis/symptom being audited on this chart:

- Gastroenteritis (viral, bacterial, influenza, "food poisoning")
- Heat-related disorders (heat stress, heat exhaustion)
- Influenza, viral syndrome
- Alcoholic intoxication
- Dermatitis
- Headache
- Dizziness
- Other: _____

The Audit: Pesticide poisoning should be ruled out in farmworkers when making the above diagnoses or evaluating the above symptoms. When arriving at the above diagnoses, did the practitioner obtain a screening occupational history which included the following? (Put a in the if done.)

- Was the farmworker possibly exposed to pesticides recently? Yes ___ No ___

(If the farmworker is sure that he/she has not recently been exposed to pesticides, pesticide poisoning has been ruled out, and no further questions need to be obtained as part of the occupational history. If there is a confirmed or possible recent pesticide exposure, the following elements of the occupational history should be obtained:)

- When did the exposure take place?
- How was the farmworker exposed?
- What crop was the farmworker working with?
- Does the farmworker know the name of the pesticide?
- Review of systems for other symptoms consistent with pesticide poisoning?
- Any localizing symptoms, suggestive of environmental exposure, eg., a rash?
- Were other workers exposed? If so, did they also develop symptoms?
- Was personal protective equipment worn?
- Were handwashing facilities available in the work area?
- If the farmworker did not know the name of the pesticide, did the health provider attempt to get the name of the pesticide from the employer or other source? 5a.

Board Meeting

Armitage County Migrant Health Center

Agenda Item: Farmworker education.

Victor Leon, Outreach Worker: I brought a farmworker to the clinic today with a terrible red eye. He got some pesticide in it and the grower didn't provide washing facilities in the field like he was supposed to. So it was half an hour before he could wash it out. When we identify a problem on the farms we have to teach farmworkers what their rights are under the law, and how to file a complaint. If we don't teach them, nobody will. Telling farmworkers their legal rights is part of preventive health care.

Carol Simpson, Clinic Director: We've worked for years to build good relationships with these farmers, so we can gain access to their camps. I'm not going to jeopardize those relationships by teaching farmworkers how to file complaints.

John Prescott, Physician: I have eight minutes to see my patients. Now you're going to ask me to tell them what their rights are under the law and how to file a complaint too?

Hilda Santiago, Farmworker: I have to go all day without urinating, because there are no toilets in the fields. I've had three bladder infections in the last two seasons. How come nobody told me I have a right to these facilities?

John Thompson, Farmworker: Listen, I came here to work and to send money back home. Don't talk to me about filing complaints... I'll lose my job.

Resources Which Are Useful to Health Providers When Evaluating Pesticide Exposure of Farmworkers

Below are listed agencies which can provide specific useful information to the health provider when evaluating pesticide exposure of farmworkers. Health Providers should identify the contacts and telephone numbers of regional, state and local agencies which will be useful resources.

Regional Poison Control Center: _____

State Lead Agency responsible for enforcement of pesticide regulations. Name: _____ Phone: _____

State Agricultural Extension Office: _____

State Department of Health, Occupational Health Division: _____

Occupational Safety and Health Administration, Area Office: _____

(Enforces field sanitation standards on farms with 11 or more workers)

State Agency responsible for enforcement of field sanitation regulations on farms of ten or less workers: _____ Phone: _____

(Some states have statutes which require field sanitation facilities on farms with less than 10 employees. If your state has such regulations, what is the minimum number of workers covered, and which state agency is responsible for enforcement?)

State Division of Worker's Compensation: _____

Regional Migrant Legal Services: _____

Laboratories which do ChE and pesticide metabolite testing

(Include address, phone, contact, type of test, cost and turn-around time.)

Migrant Clinics, private health providers and emergency rooms in area which provide services to farmworkers.

The EPA Manual, Recognition and Management of Pesticide Poisonings, (4th Edition, 1989) may be obtained for \$8.00 from:

U.S. Government Printing Office

Washington, D.C.

(202) 783-3238

Order Stock #: GPO 055-000-00359-9

Farmworker Health and Safety Institute Evaluation of Training

Presenter(s) _____

Presentation Title: _____

Date of Presentation _____ Location _____

Please circle your response in your evaluation of the presentation according to the following measures:

- 5 = Excellent
- 4 = Above Average
- 3 = Average
- 2 = Below Average
- 1 = Unsatisfactory

You are a:

- Physician Nurse
- Nurse Practitioner,
Physician Assistant
- Outreach worker
- Other _____

- | | | | | | |
|-----------------------------------------------|---|---|---|---|---|
| 1. Clarity of presentation | 5 | 4 | 3 | 2 | 1 |
| 2. Involvement of participants | 5 | 4 | 3 | 2 | 1 |
| 3. Quality of teaching materials | 5 | 4 | 3 | 2 | 1 |
| 4. Usefulness of information to your practice | 5 | 4 | 3 | 2 | 1 |
| 5. Appropriate level of information | 5 | 4 | 3 | 2 | 1 |
| 6. Overall quality of presentation | 5 | 4 | 3 | 2 | 1 |

7. What were the most valuable elements of the presentation? _____

8. How could the presentation be improved? _____

Resource ID 7073

**Health Provider Training In Evaluation of
Pesticide Exposure of Farmworkers**