SCRIPT OF THE RECOGNITION, MANAGEMENT, AND REPORTING OF PESTICIDE ILLNESS ONLINE COURSE

MODULE 1 - COURSE INTRODUCTION

Slide 1 - Course Introduction

Welcome to this course on the "Recognition, Management, and Reporting of Pesticide Illness." This course was developed by the Office of Environmental Health Hazard Assessment, a department in the California Environmental Protection Agency. The author is William Ngai, MD, MPH. Dr. Ngai is the Public Health Medical Officer for the Office of Environmental Health Hazard Assessment.

Slide 2 - Disclosure of Conflict of Interest or Commercial Support

No individuals involved in the planning or presentation of this activity have any relevant financial relationships with commercial interests to disclose.

Slide 3 - Course Objectives

Because this course was initially developed for California physicians, some of the information pertains specifically to California legal requirements. However, most of the information will also be useful to physicians outside the state.

By the end of this course, you will be able to:

- Define pests and pesticides as stated by California law;
- List potential ways someone can be exposed to pesticides;
- Describe ways to diagnose pesticide illnesses;
- List ways of recognizing and treating illnesses resulting from exposure to cholinesterase-inhibiting pesticides, including organophosphates and N-methyl carbamates; and
- List physician requirements for reporting a pesticide-related illness.

We hope you enjoy the course. Open Module 2 to get started.

MODULE 2 - PESTS, PESTICIDES, AND EXPOSURE

Slide 1 - Pests, Pesticides, and Exposure

In this module we'll discuss pests, pesticides, and exposure to pesticides.

By the end of this module you should be able to:

- Define what a pest is according to California law;
- Define what a pesticide is according to California law;
- Describe general pesticide use, exposure, and illness statistics for California; and
- Describe how people can become exposed to pesticides.

Let's get started.

Slide 2 - What is a Pest?

What is a pest?

California's legal definition of a pest is based on the federal legal definition, and states that "a pest is any insect, predatory animal, rodent, nematode, weed, plant or animal, virus, fungus, bacteria, or other organism liable to become dangerous or detrimental to the agricultural or nonagricultural environment of the state."

Microorganisms such as viruses, fungi, and bacteria can be defined as pests except when they are on or in living animals or humans.

The law also stipulates that a pest can be "anything that the director of the department of pesticide regulation declares to be a pest." (California Food and Agricultural Code, Section 12754.5)

Slide 3 - What is a Pesticide?

Now, let's define pesticide.

California's legal definition of a pesticide is also based on the federal legal definition. It states:

"Any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animal, or households, or be present in any agricultural or nonagricultural environment whatsoever."

Slide 4 - Pesticide Use in California

In 2014, 189 million pounds of active ingredients in pesticides were applied for agricultural use in California. Fresno, Kern, and Tulare were the leading counties for this use. During the same year, 687 million pounds of active ingredients in pesticides were sold in California. These include antimicrobials and sanitizers, which were categorized as pesticides, and accounted for over 400 million pounds of the total.

Slide 5 - Antimicrobials and Topical Drugs

Antimicrobials and sanitizers are considered pesticides if the label says they kill or control the growth of microorganisms, but the product must be used for that purpose.

For example, bleach used to disinfect food preparation surfaces is a pesticide. The same bleach used to whiten clothing is not a pesticide. The intent of use is what determines if it is a pesticide.

Topical products used on humans to kill insects and lice, for example, are regulated as drugs, not pesticides.

Some examples of this are lindane, permethrin, and malathion shampoo or lotion.

Slide 6 - Pesticide Exposure Scenarios

Now that we know what pests and pesticides are, let's talk about how people are typically exposed to them.

There are many ways for people who work with, or around, pesticides to become exposed. Pesticide handlers can become exposed through direct contact. Field workers can become exposed through contact with plant leaves and produce that have been treated with pesticides.

When pesticides are applied through the air by crop-dusting or other methods, people can unintentionally be exposed due to drift, which is when the pesticides move through the air and land somewhere other than the intended area.

Another possible reason for exposure is the handling of pesticide containers that haven't been decontaminated.

In most cases, occupational pesticide illnesses are caused by dermal absorption.

Slide 7 - Non-Occupational Pesticide Exposure

It's not just individuals working directly with or around pesticides that are at risk. The general public is also at risk for pesticide exposure. Pesticides are used in schools, in the maintenance of lawns and gardens, in household cleaning, and home pest control.

Improper pesticide storage and transfer to other containers is also a factor that can lead to unintentional exposure and poisoning.

Slide 8 - Pesticide Illnesses in California

Let's look at some statistics regarding pesticide illness in California.

From 2000 to 2013, between 1,000 and 1,500 cases of pesticide illness were reported each year.

In a typical year, about two-thirds of the cases reported were classified as definitely, probably, or possibly due to the pesticide reported to be at fault. The remaining third of the cases were deemed unlikely to have been caused by the reported pesticide.

More than one half of the cases classified as definitely, probably, or possibly due to the reported pesticide, were due to non-agricultural use, including antimicrobials and home use insecticides.
The pesticide that has usually generated the most pesticide illness reports is sodium hypochlorite, commonly known as bleach.

Underreporting of pesticide illnesses remains an ongoing problem.

Slide 9 - End of Module

This concludes our module on pests, pesticides, and exposure.

You should now be able to:

- Define what a pest is according to California law;
- Define what a pesticide is according to California law;
- Describe general pesticide use, exposure, and illness statistics for California; and
- Describe how people can become exposed to pesticides.

In the next module, we'll discuss diagnosing pesticide-related illness.

MODULE 3 - DIAGNOSING PESTICIDE-RELATED ILLNESS

Slide 1 - Diagnosing Pesticide-related Illness

In this module we'll discuss how pesticide-related illnesses are diagnosed.

By the end of this module, you should be able to:

- Explain how patient history is most important for diagnosing pesticide-related illness;
- List questions that should be asked when taking an exposure history;
- List questions that should be asked when taking an occupational medicine history;
- Apply the "Quick Survey;"
- Describe how pesticides can be classified; and
- List sources where more information regarding pesticides and pesticide poisoning can be found.

Let's get started.

Slide 2 - The Most Important Information for Diagnosing Pesticide-related Illness

What do you think is the most important information needed to make a diagnosis of a pesticide-related illness?

Is it the history, the physical exam findings, or the laboratory test results?

The answer is the history. The history is the most important information, and within the history, it is the exposure history that is most important.

Slide 3 - Exposure History

When working through the exposure history of a patient, there are some questions that need to be asked.

First: "What was the pesticide?"

Next: "What was the exposure?"; "Was the exposure sufficient to cause the signs and symptoms?" and "Was it consistent with the known effects of the pesticide?"

Next: "Was protective equipment being used, and was it working?"

Finally: "When did the exposure occur, and when did the signs and symptoms occur?"

Slide 4 - Screening Questions in an Occupational Medicine History

Workers can be exposed to chemicals, including pesticides, but not be aware of it. Therefore, a standard occupational history should incorporate routine screening questions such as:

- Does the patient's occupation involve an exposure to toxic chemicals?
- Exactly what are the specific job duties—not just the job title?
- Do other co-workers have the same or similar symptoms?
- Are the symptoms related to anything at work?
- Are the symptoms worse at work, and do they improve when off work, or when going on vacation?
- Are there exposures to other chemicals at work or in the home?

If any answers to these questions indicate exposure to a pesticide, then a more detailed exposure history should be taken, including past occupations and exposures. If necessary, the physician should consider visiting the worksite.

Slide 5 - The Quick Survey

Physicians in general practice should consider incorporating similar questions to screen for illnesses that can result from chemical exposures when taking history from a patient. This is called "The Quick Survey."

Some of these questions are:

- What kind of work do you do?
- Do you think your health problems are related to your work?
- Are your symptoms better or worse when you're at home or at work?
- Are you now or have you previously been exposed to dust, fumes, chemicals, radiation, or loud noise?

If the patient answers any of these questions in the affirmative, you should take a more detailed exposure history from the patient.

Slide 6 - What to Evaluate to Make a Diagnosis

History, physical findings, lab tests, and response to therapy are all useful for making the diagnosis of a

pesticide illness.

Here are some important points for the diagnosis of a pesticide illness:

One- As previously mentioned, the exposure history is the most important information the physician needs to make the correct diagnosis.

Two- Pesticide illnesses can often resemble other illnesses such as viral syndromes, flu-like illnesses, gastroenteritis, and so forth.

Three- Pesticide illnesses can be difficult to diagnose.

Four- For most pesticide illnesses, there are no specific diagnostic tests or specific therapies.

Slide 7 - Routes of Absorption

How do pesticides enter the body?

One route of entry is by inhalation, which is the fastest way to absorb pesticides.

Another route is by ingestion, which is frequently seen in suicides and is the most common method of absorption for children.

Another route is by dermal exposure, which is a slower route, symptoms may not appear for 6-12 hours after dermal absorption. It's also the common route of entry for occupational exposures.

Patients with significant exposures should be observed for at least several hours.

Slide 8 - Classification of Pesticides by Target or Function

Pesticides can be classified according to their target organisms or their function. Some of these classifications are:

- Insecticides
- Miticides
- Herbicides
- Fungicides
- Nematocides
- Rodenticides
- Fumigants
- Disinfectants and sanitizers
- Plant growth regulators, and
- Insect repellents

Slide 9 - Classification of Pesticides by Chemical Group

Pesticides can also be classified according to their chemical groups. These classifications include:

- Organophosphates, and
- N-methyl carbamates
- Pyrethroids
- Organochlorines, and
- Neonicotinoids

Slide 10 - [Section Slide] Finding More Information

There are many resources available if you need to do further research on a pesticide.

Slide 11 - Sources of Information

You can find information from pesticide labels, specifically the US EPA registration number. Safety Data

Sheets (or SDS), formerly known as Material Safety Data Sheets (MSDS), are useful. You can also get information from the worker's employer, as well as the County Agricultural Commissioners.

The California Poison Control System is an excellent source of information for treatment advice and can report pesticide illnesses to state authorities for physicians. The US Environmental Protection Agency is another resource.

Online resources include the websites for the National Pesticide Information Center, and the California Department of Pesticide Regulation.

Slide 12 - California Government Sources of Information

In California, the Department of Pesticide Regulation, the Occupational Health Branch of the Department Public Health, and the Office of Environmental Health Hazard Assessment are available to provide you with more information.

You can find a list of the resources we have mentioned here, along with their contact information, as well as other additional resources, in the PDF that accompanies this module.

Slide 13 - End of Module

This concludes our module on diagnosing pesticide-related illness.

You should now be able to:

- Explain how patient history is most important for diagnosing pesticide-related illness;
- List questions that should be asked when working through exposure history;
- List questions that should be asked when working through an occupational medicine history;
- Apply "The Quick Survey";
- Describe how pesticides can be classified; and
- List sources for finding more information regarding pesticides and pesticide poisoning.

In the next module, we'll discuss recognition and management of organophosphate and N-methyl carbamate pesticide-related illness.

MODULE 4 - RECOGNITION AND MANAGEMENT OF ORGANOPHOSPHATE (OP) AND N-METHYL CARBAMATE PESTICIDE-RELATED ILLNESS

Slide 1 - Recognition and Management of Organophosphate (OP) and N-methyl Carbamate Pesticide-Related Illness

In this module, we'll discuss recognition and management of organophosphate (also known as OP) and N-methyl carbamate pesticide-related illness.

By the end of this module, you should be able to:

- Discuss what organophosphate and carbamate pesticides are;
- Compare how OPs and carbamates affect the normal physiologic process;
- Describe the effects of cholinergic syndrome;
- List the signs and symptoms of OP and carbamate poisoning;
- Describe how laboratory tests can help with diagnosis of OP poisoning
- Discuss medications for cholinesterase-inhibiting pesticide poisoning.

Let's get started.

Slide 2 - Organophosphate and N-methyl Carbamate Pesticides

Organophosphate (OP) and carbamate pesticides are cholinesterase-inhibiting pesticides. Historically, they have caused more serious illnesses in California than any other class of pesticide. In past years, they've caused up to 1/3 of pesticide illnesses annually in CA.

Examples of organophosphates include acephate, chlorpyrifos, dimethoate, malathion, and naled.

Examples of carbamates include carbaryl, methomyl, and oxamyl.

Unlike most pesticide poisonings, there is a test that can aid in the diagnosis of these types of pesticide poisonings. There is also a specific therapy —an antidote for poisonings caused by them.

Slide 3 - Exposure Example

Here is an example of workers who became seriously ill from exposure to two very toxic OP pesticides:

Twenty-three farm workers went into a cauliflower field in the Salinas Valley six hours after two highly toxic OPs, mevinphos and phosphamidon, were applied, even though regulations restricted re-entry for 72 hours. Two hours later, a few workers noticed the onset of blurred vision and eye irritation. Shortly after that, others developed dizziness, weakness, disorientation, headache, nausea, and vomiting. Several had cramping of the arms, legs, and stomach. Two workers collapsed with bradycardia, increased salivation, miosis, and muscle fasciculations. Sixteen sought treatment and were hospitalized. The sickest workers were treated with IV atropine and pralidoxime. Fifteen received weekly follow-up to monitor their RBC cholinesterase activity levels.

Slide 4 - Key Takeaways of This Case

The minimum restricted entry time interval in this case was 72 hours. This amount of time would allow the pesticides to degrade enough to be safe for workers to enter this field. The entry after only 6 hours was a violation of regulations. The workers seemed to have absorbed the pesticide dermally. These workers subsequently developed signs and symptoms typical of serious poisonings.

Violating restricted entry intervals of treated fields remains an ongoing problem, and still causes pesticide illness for field workers.

Slide 5 - Pathophysiology of Cholinesterase Inhibition

In the normal physiologic process, the neurotransmitter acetylcholine is released from cholinergic presynaptic neurons, and migrates to receptors on postsynaptic cells. The enzyme acetylcholinesterase, which is present in the intercellular space of these synapses, hydrolyzes this acetylcholine to choline and acetic acid to end the neuro signal transmission. Post synaptic cells include muscle cells, exocrine gland cells, and other neurons.

OPs and carbamates bind to acetylcholinesterase at the binding site for acetylcholine, rendering the enzyme inactive.

This leads to an accumulation of acetylcholine at the synapses, and to continuous stimulation or overstimulation of the postsynaptic receptors.

Signs and symptoms that develop due to poisoning from these pesticides depend on which cells are continuously over-stimulated.

Slide 6 - Comparison of Organophosphate and Carbamate Inhibition of Cholinesterase

Let's compare the inhibition of cholinesterase by OPs and carbamates.

OPs bond to acetylcholinesterase in a two-step process.

Initially, the bond is reversible. Pralidoxime, which will be mentioned later, is an effective antidote during this time. Up to 6 hours later, the acetylcholinesterase-OP bond 'ages' and becomes permanent. Pralidoxime is ineffective once this occurs.

On the other hand, carbamates bind with acetylcholinesterase reversibly. The bond does not become permanent.

In general, carbamates cause milder illnesses than OPs, with a few exceptions such as aldicarb, which was one of the most toxic pesticides ever used in California. It is not registered for use there.

Slide 7 - Cholinergic Syndrome – Muscarinic Receptors

As previously discussed, OP and carbamate poisoning can lead to the continuous overstimulation of the postsynaptic receptors. This can lead to what is known as a cholinergic syndrome.

Overstimulation of muscarinic receptors by acetylcholine can affect a number of organ systems, and cause these signs and symptoms:

- Diaphoresis;
- In the eyes, miosis, lacrimation, blurred vision, and discomfort;
- Respiratory effects including wheezing, cough, shortness of breath, and bronchorrhea;
- Cardiac effects, including bradycardia and hypotension;
- Gastrointestinal effects, including salivation, nausea, vomiting, defecation, incontinence, diarrhea, and abdominal pain; and
- Genitourinary effects, including incontinence and increased frequency of urination.

Slide 8 - Cholinergic Syndrome – Nicotinic and CNS Receptors

Overstimulation of nicotinic receptors by acetylcholine can cause the following signs and symptoms:

- Cardiovascular effects can include tachycardia and hypertension;
- Musculoskeletal effects include fasciculations, muscle weakness, paralysis, cramps, and weakness of respiratory muscles.

Overstimulation of central nervous system receptors by acetylcholine can cause a range of neurologic signs and symptoms, including:

- Headache
- Anxiety
- Confusion
- Psychosis
- Ataxia
- Dysarthria
- Tremor
- Seizures

- Stupor
- Coma
- Respiratory depression
- Cheynes-Stokes respiration

Slide 9 - SLUDGE – Common Signs and Symptoms of OP or Carbamate Poisoning for Diagnosis

Possible signs and symptoms from OP or Carbamate poisoning are numerous; however, here are some common signs that you can remember by using the mnemonic 'SLUDGE.'.

- **S**alivation that is excessive
- **L**acrimation*
- **U**rination*
- **D**efecation or diarrhea*
- **G**astrointestinal upset
- **E**mesis

Slide 10 - Other Useful Signs and Symptoms

Other useful signs and symptoms of OP or carbamate poisoning include:

- Muscle fasciculations and weakness*
- Miosis, or pupil constriction*
- Respiratory depression
- Seizures
- Loss of consciousness and
- Smell of hydrocarbon constituents*

Those marked with an asterisk and found in combination are good clues of cholinesterase inhibition.

Signs and symptoms vary, and they are often non-specific. In several series of OP poisonings, the most common sign was pupil constriction, which was present in up to 80% of the cases.

It should be emphasized that the primary cause of death from OP or carbamate poisoning is respiratory failure. Therefore, their respiratory status should be evaluated carefully and monitored closely.

Slide 11 - Differential Diagnosis

Poisonings from OP and N-methyl carbamate pesticides often resemble other illnesses.

Mild cases may resemble acute viral syndrome, along with gastroenteritis, respiratory infections, asthma, psychological dysfunction, and allergic dermatitis.

Severe cases may resemble an acute cerebrovascular accident, along with heat stroke, heat exhaustion, epilepsy, infection, meningitis, encephalitis, pneumonia or psychosis.

Slide 12 - Laboratory Tests

Because poisoning from OP pesticides can decrease plasma and RBC cholinesterase activity, laboratory tests can help confirm the diagnosis. Both plasma and RBC cholinesterase activity levels should be measured.

Association between symptoms and cholinesterase activity can vary. In addition to the dose of the pesticide, the rapidity of decrease in cholinesterase activity is an important determinant of the onset of symptoms.

A word of caution: a very low cholinesterase level can help confirm a diagnosis. But be careful in interpreting cholinesterase tests within the testing lab's 'normal' range. Sometimes a result in the normal range actually represents decreased activity for a patient with a normally high baseline for cholinesterase activity.

The diagnosis can be confirmed retrospectively by obtaining cholinesterase activity levels acutely, and repeating them over the next few weeks or months.

These tests may not be as useful for carbamate poisoning because the carbamate bond with cholinesterase can reverse rapidly, often while the blood sample is still in the test tube, so the depression of cholinesterase activity may not be detected.

Slide 13 - Children's Study

The most common route of absorption for pesticide poisoning in children in California is by oral ingestion. This was also demonstrated by in study of OP and carbamate poisoning in children conducted at Children's Medical Center in Dallas. There was a total of 37 patients in the study. Important points in that study include:

- 97% of poisonings occurred in the home;
- 76% of poisonings occurred as a result of an oral ingestion;
- 70% of poisonings drank liquid OPs improperly stored in food or drink containers;
- 80% of 20 patients transferred from other ERs were incorrectly diagnosed.

Regulations in California prohibit storing pesticides in a food or drink container.

Slide 14 - Medications for Cholinesterase-inhibiting Pesticide Poisoning

Most pesticide illnesses do not have a specific treatment other than supportive care. Supportive care may include endotracheal intubation and mechanical ventilation for oxygenation and to prevent aspiration; and decontamination of the patient. However, treatment for poisonings due to cholinesterase-inhibiting pesticides is unique in that there are 2 medications available, atropine and pralidoxime.

Atropine is a competitive inhibitor of acetylcholine at the receptor sites on post synaptic cells. This is the mainstay treatment and can be administered via IV or IM.

Pralidoxime is an acetylcholinesterase reactivator. It acts by breaking the bond between acetylcholinesterase and an organophosphate before the bond becomes permanent. This can be administered via IV in adults and children older than age 12. A word of precaution here: pralidoxime is not indicated for isolated carbamate poisonings but can be considered for mixed carbamate/OP poisonings.

Slide 15 - Management of Seriously Poisoned Patients in a Hospital Setting

When attending a victim of pesticide poisoning in a hospital setting, there are precautions that should be taken to protect yourself.

These include avoiding direct contact with heavily contaminated clothing and vomitus. Rubber gloves should be worn while washing pesticide from skin and hair. Vinyl gloves provide no protection from dermal absorption.

Slide 16 - [Section Slide] Case Studies

Slide 17 - Case Example – Worker 1

Let's look at another case example.

Worker 1, a 25-year-old pesticide formulator spilled a highly concentrated 76% solution of parathion, an OP, on his inguinal and scrotal areas and legs. He removed his clothes, showered, and changed overalls and boots. Two days later, he developed nausea and diarrhea. He went to the emergency department and was treated with Compazine and sent home. **The worker did not tell the physician of his exposure during this first visit.** Two days later, he returned to the ED with weakness, nausea, and sweating. The patient appeared ill; his pupils were constricted, and he exhibited nystagmus. The worker mentioned his h**istory of parathion exposure on this visit.** The patient was admitted and treated with atropine and pralidoxime. He responded to treatment and was discharged the next day.

Slide 18 - Case Example – Worker 2

Twelve days after Worker 1's exposure, Worker 2, a 23-year-old formulator, developed nausea and vomiting. Worker 2 was sent to the emergency department since his screening cholinesterase suggested organophosphate poisoning, even though he had not worked with any organophosphates. In the emergency department, he had nausea, vomiting, loss of consciousness, apnea, seizures, and fecal and urinary incontinence. The patient was admitted, intubated, and mechanically ventilated, and was treated with diazepam, phenobarbital, atropine, and pralidoxime. He regained consciousness and improved rapidly and was discharged the next day.

Slide 19 - Case Example – Worker 3

Fifteen days after Worker 1's exposure, Worker 3, an 18-year-old pesticide formulator, developed nausea and vomiting. Worker 3 was sent to the emergency department where he was diaphoretic and had pinpoint pupils. He was treated with 1 gram of pralidoxime, did well, and was discharged.

Slide 20 - Workers 1, 2, and 3 – What Happened?

The plant safety officer was very concerned by these cases because there had been no poisonings over the previous few years, and now there were 3 in a 2-week period. The plant had a longstanding practice of strictly enforcing safety measures. Coveralls, respirators and gloves were used when indicated. Pesticide-contaminated clothing was bagged and burned.

So, what happened here, and how were these 3 cases related? An investigation showed that:

Worker 1 immediately changed out of his coveralls and bagged them to be burned after the initial spill; however, the coveralls were laundered instead of burned. Worker 1 subsequently wore the coveralls and was made ill again.

After another washing, **Worker 2** wore the same coveralls, which made him ill.

And after yet another washing, **Worker 3** wore the same coveralls, which made him ill.

Analysis of the coveralls showed a very high concentration of parathion. The wash water and other coveralls were also found to be contaminated. All coveralls were then destroyed and replaced.

Slide 21 - Important Points Regarding This Case

There are several important points that we can take away from this case.

1. The exposure history is the most important for the diagnosis. Worker 1 was initially incorrectly diagnosed when he did not give his exposure history. It was only after he provided an exposure history on the second visit to the ER that he was correctly diagnosed.
2. Pesticide illnesses can resemble other common illnesses. In this case, **Worker 1**'s presentation initially was thought to be a gastroenteritis, and was treated as such.
3. Physical exam findings can also be helpful. **Workers 1 and 3** had constricted pupils.
4. Supportive therapy, especially of the respiratory system, is very important. **Worker 2** required intubation and mechanical ventilation.
5. Finally, dermal absorption is the most common route of occupational poisoning.

Slide 22 - End of Module

This concludes this module on recognition and management of organophosphate and N-methyl carbamate pesticide-related illness.

You should now be able to:

- Discuss what organophosphate and carbamate pesticides are;
- Compare how OPs and carbamates affect the physiologic process;
- Describe cholinergic syndrome;
- List the signs and symptoms of OP and carbamate poisoning;
- Describe how laboratory tests can help with diagnosis of OP and carbamate poisoning; and
- Discuss medications for cholinesterase-inhibiting pesticide poisoning.

In the next module, we'll discuss reporting pesticide illness in California.

MODULE 5 - REPORTING PESTICIDE ILLNESS IN CALIFORNIA

Slide 1 - Reporting Pesticide Illness in California

This next section on pesticide illness reporting pertains specifically to California physicians who have been required to report pesticide illnesses since the 1970s.

By the end of this module you should be able to:

- Explain California law for reporting pesticide illness; and
- List ways of reporting pesticide illness in California.

Let's get started.

Slide 2 - California Health and Safety Code Section 105200

If you've gone through the other modules, you've learned what pesticides are, how patients can come into contact with pesticides, and how to diagnose and recognize pesticide illness. Now we'll turn our attention to reporting pesticide illness, which must be done according to California law.

The California Health and Safety Code of law specifies who has to report, to whom to report, how to report, and when to report pesticide illnesses.

Who must report? “Any physician or surgeon who knows, or has reasonable cause to believe, that a person is suffering from pesticide poisoning or any disease or condition caused by a pesticide…”

To whom must they report? “…to the local health officer…”

When shall they report it? “…within 24 hours…”

For the case of a worker, the physician must send “…a copy of the report required pursuant to subdivision (a) of Section 6409 of the Labor Code within seven days…” This is the Doctor’s First Report of Occupational Injury or Illness.

If the physician fails to comply, they “...shall be liable for a civil penalty of two hundred and fifty dollars…”

The law also states, “in no case shall the treatment administered for pesticide poisoning or a condition suspected as pesticide poisoning be deemed to be first aid treatment.”

Slide 3 - Reporting Pesticide Illness in California

California physicians must use one of the following 4 methods to report a pesticide illness:

- One, calling the local county health officer or the health officer’s designee;
- Two, calling the California Poison Control Center;
- Three, filing a Confidential Morbidity Report form; or
- Four, reporting electronically, using CalREDIE, the California Reportable Disease Information Exchange if it is available in the physician’s county.

Slide 4 - Reporting Work-Related Pesticide Poisoning in California

For a work-related case of pesticide poisoning, there is an additional reporting requirement.

Physicians must report the case using one of the four previously mentioned methods but must also send a copy of the Doctor’s First Report of Occupational Injury or Illness to the employer or insurer within 5 days of the first visit, and to the Local Health Officer within 7 days of the first visit.

Slide 5 - End of Module

This concludes our module on reporting pesticide illness in California.

You should now be able to:

- Explain California law for reporting pesticide illness and
- List ways of reporting pesticide illness in California.

In the next module, we’ll discuss cultural and linguistic competency.

MODULE 6 - CULTURAL AND LINGUISTIC COMPETENCY

Slide 1 - Cultural and Linguistic Competency

In this module, we’ll discuss cultural and linguistic competency, concepts that are useful when working with a diverse patient population.

By the end of this module, you should be able to:

- Describe how cultural competency is key to communicating with a diverse patient population;
- Describe strategies for finding and working with an interpreter; and
- Describe strategies for ensuring good communication with the patient.

Let's get started.

Slide 2 - Cultural and Linguistic Competency

When communicating with a diverse patient population, cultural competency is key.

Consider this quote from the US Department of Health and Human Services. "With the increasing diversity of the US population, physicians are more and more likely to encounter situations that require the delivery of culturally competent care, access to a vast array of language services, and supportive healthcare organizations."

Slide 3 - Finding an Interpreter

At times you may find yourself needing to communicate with a patient who has limited English ability. In events like these, there are options for finding a potential interpreter. The health provider or someone on the health staff may be proficient in the patient's language. There may be an option for a trained interpreter to assist you. Sometimes a family member of the patient, with the exception of a child, can help.

Whatever your options, use the method that is most comfortable for the patient.

Slide 4 - Cultural and Linguistic Competency (cont'd.)

When you are able to communicate with your patient, the California Academy of Family Physicians recommends that you:

Greet and speak to the patient; speak clearly with short sentences; ask one question at a time; ask the interpreter to point out potential misunderstandings or sensitive areas; do not interrupt the interpretation; and treat the interpreter as a professional.

Slide 5 - End of Module

This concludes our module on cultural and linguistic competency. This also concludes this course.

If you have completed all of the modules in this course, you should now be able to:

- Define pests and pesticides as stated by California law;
- List potential ways someone can be exposed to pesticides;
- Describe ways to diagnose pesticide illnesses;
- List ways of recognizing and treating illnesses resulting from exposure to cholinesterase-inhibiting pesticides (organophosphates and N-methyl carbamates); and
- List physician requirements for reporting a pesticide-related illness.

We hope you have found the course useful and informative.