



# Occupational Health Watch

Preventing California Worker Injuries & Illnesses

## Our Purpose

The Occupational Health Branch (OHB) is a non-regulatory, public health program in the California Department of Health Services (DHS). Our purpose is to promote healthy California workplaces by identifying and evaluating hazards; tracking worker injuries and disease; providing information, training, and technical assistance; recommending protective standards; and working with others to develop safer ways to work.

We created *Occupational Health Watch* to share what we are learning and doing with industry, unions, the health and safety community, and others who can make a difference. Each issue features articles on different industries and hazards at work. Look for our “True Story” articles – they tell how a worker got sick or injured and how it could have been prevented – and use them as tools for discussion in short safety trainings. If you would like to reprint an article, contact us for an electronic version.

**We’ve moved to Richmond!** See back page for new address and phone numbers.

### In this issue

Pesticide illness in CA	2-3
Preventing heat illness	4
Lead safety efforts	
Los Angeles partnership	5
New leadership	10
Focus on construction	
Tailgate training	6
Carpenter falls	7
Safe trenching	8
Preventing asthma	9
True Stories	
Pesticide poisoning	3
Teen killed by forklift	5
Wood chipper fatality	10
Auto repair health and safety	11
Getting more information	12

## Tractor Rollovers Kill



**Tractor with rollover protection structure.**

On average, one American farm worker is crushed to death every three days when a tractor overturns during operation; many more suffer serious injuries. To prevent these injuries, both a rollover protection structure (ROPS) and seat belts are required for tractors built after 1976. A ROPS is a structure like a roll-bar that protects the operator if the tractor overturns.

As part of their Injury and Illness Prevention Program (IIPP), farm employers should ensure that safety controls are in place and that workers are trained on how to operate tractors safely.

The Farm Family Health and Hazard Surveillance (FFHHS) project was an OHB research effort designed to investigate the hazards facing agricultural workers in California. Funded by the National Institute for Occupational Safety and Health (NIOSH), the goals of the research team were to learn more about the health status of farm workers and their families, and to identify the types of unsafe conditions that exist on California farms.

Over a six-year period, OHB staff visited a total of 343 farms in Monterey and Fresno Counties. Farms were chosen to get a sample of different farm sizes and types of crop. A trained safety expert interviewed workers and conducted a detailed inspection of 130 of these farms for safety hazards and control measures.

The project found that almost half the farms lacked the required IIPP and did not train workers in tractor safety. Nearly two of every five tractors built after 1976 lacked ROPS, and three of five tractors were missing both ROPS and seat belts. OHB recommends that employers implement effective IIPPs, provide safety training, and either retrofit tractors with ROPS and seat belts or replace older tractors that cannot be retrofitted.

# Pesticides Continue to Harm Workers

Pesticides are the only toxic chemicals intentionally released into the environment to cause harm to living things. Worldwide pesticide use is increasing. In the United States alone, over 4.5 billion pounds of chemicals are used as pesticides every year. Over three-fourths of the total amount of pesticide use in the United States occurs in agriculture; the rest is used by homeowners and in applications to buildings and gardens.



As the top agricultural state in the nation, California uses large amounts of pesticides to maintain high-volume agricultural production. In 2002, over 172 million pounds of pesticide use was reported in California.

Many factors contribute to workers

**Workers are exposed to pesticides.** becoming ill from exposure to pesticides each year: the large amount of pesticides used, the number of workers in jobs that place them at risk for exposure, and unsafe work practices, among others. In 2001, 1.1 million farm workers worked on California farms. Over 11,000 workers apply pesticides to buildings in California, with a 30% increase projected by 2010.

## Uncovering the Truth

Since 1987, OHB has worked to understand the causes of pesticide illness and prevent similar illnesses in the future. Through the support of NIOSH and the U.S. Environmental Protection Agency (EPA), OHB conducts the following activities:

- uses physician reports to track work-related pesticide illness statewide;
- investigates selected incidents of work-related pesticide illness; and
- makes recommendations for preventing illnesses.

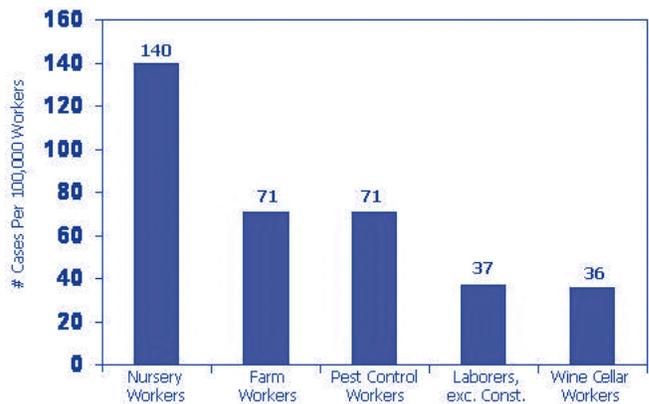
Between 1998 and 2002, OHB found 1,273 cases of work-related pesticide illness in California. The majority of workers were young (mean age 35 years) and male (67%). Pesticide illness affected many types of workers, such as school teachers, office workers, meter readers, construction workers, and pet groomers. Nearly half of all workers with pesticide illness (46%) were farm workers.

Nursery workers had the highest rate of pesticide illness (see figure below). Farm workers, pest control workers, laborers (excluding construction), and wine cellar workers also had particularly high rates of illness.

Pesticides are grouped into several chemical categories. OHB found that four different pesticide categories were responsible for over half of the work-related pesticide illnesses:

- Organophosphate and carbamate pesticides, used primarily in agriculture, together accounted for 21% of pesticide illnesses;
- Pyrethroid pesticides, increasing in use for both agricultural and building applications, accounted for 12%;
- Inorganic compounds such as sulfur, commonly used as a fungicide on grapes, accounted for 15%; and
- Glyphosate, found in weed killers such as Roundup™, caused 6% of pesticide illnesses.

## Top 5 Occupations with Pesticide Illness, 1998-2002



## Health Effects Likely Undercounted

At the time they were exposed, the majority of workers with pesticide illness (64%) were performing regular work tasks not related to pesticide mixing, loading, or application. For example, a farm worker may have been weeding, pruning, or harvesting at the time they became exposed to pesticides through skin contact or drift.

Illness due to pesticide drift occurs when a pesticide is spread by wind or weather to an area where it was not intended to be applied, causing exposure to unprotected workers. OHB found that 17% of ill workers were exposed to pesticides through drift. Outdoor workers are not the only ones at risk: nearly a fifth of workers were exposed to pesticides indoors, primarily to pyrethroid pesticides.

OHB found that workers with pesticide illness report a variety of health effects. The nervous system is most commonly affected, followed in order of frequency by the gastrointestinal and respiratory systems, the skin, and eyes. Reported health effects include red and itchy skin; painful, irritated eyes; shortness of breath; nausea and vomiting; headache; and dizziness.

OHB believes that occupational pesticide illnesses are undercounted for several reasons. First, workers may not recognize pesticide illness or may face barriers when seeking medical attention for pesticide illness. Doctors may have trouble recognizing pesticide illness, or may not be aware that they are required to report all suspected work-related and pesticide-related illness in California. Also, many workers are exposed to several different pesticides simultaneously, making it difficult to determine cause.

Finally, it is important to keep in mind that the current system tracks only acute (short-term) pesticide illness and does not capture any chronic illness (such as cancer or nerve damage) in workers that may have been caused by exposure to pesticides.



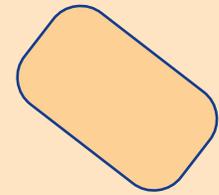
**Aerial spraying may result in pesticide drift.**

## Making a Difference

To encourage physicians to recognize and report pesticide illnesses, OHB, Cal/EPA, and others in the state conduct trainings for health care providers. OHB also produced an educational CD, *Pesticide Illness*, which is being used as a teaching module throughout the country (available at [www.aoc.org/resources.htm](http://www.aoc.org/resources.htm)).

Based on field investigations, OHB has recommended that specific work practices be changed in order to reduce future pesticide illnesses among workers. For example, following an investigation of illness due to pesticide drift, we recommended that a minimum one-mile buffer zone be required and maintained for 72 hours for all sprinkler applications of metam-sodium. In order to make a significant difference in the long run, OHB supports research and adoption of less toxic methods of pest control.

## 34 Poisoned – No Warning Given



### What happened?

A 66-year-old male farm worker was seen at an urgent care center complaining of eye irritation, abdominal pain, nausea, vomiting, headache, dizziness, frequent urination, and muscle shaking that began an hour before. He was hospitalized because his pulse was irregular and fast. Blood tests revealed a very low level of the enzyme cholinesterase, a sign of pesticide poisoning. He had been weeding a cotton field for four hours that morning. Thirty-three other crew members were also seen at the urgent care center complaining of similar symptoms. Several also had low cholinesterase levels. The youngest member of the crew was 13 years old.

Two hours before the crew began weeding that morning, a crop duster had sprayed the cotton field with a mixture of pesticides including carbofuran, a carbamate. According to the pesticide label, workers should have been prohibited from entering the field for 48 hours after the application. By law, employers are required to inform workers about pesticide applications. However, neither verbal nor written warning about the pesticide application was provided to this crew.

The workers were exposed to extremely high levels of an acutely toxic carbamate pesticide and suffered severe symptoms of poisoning as a result. Pesticides were detected in their clothes and urine. While most of the symptoms disappeared within a few days, some workers continued to complain of health problems three months following the incident. The worker whose symptoms were described above had the most serious effect, an irregular heartbeat known as atrial fibrillation. After medical treatment, his heartbeat returned to normal.

The grower was eventually fined for failure to notify the workers about the pesticide application. Fines levied on growers may motivate some to comply with regulations, but are typically not large enough to have much financial impact over the long term.

### What was learned?

- Agricultural workers, especially those performing hand labor, should be notified, both verbally and in writing, of pesticide applications in fields.
- Pesticides should be substituted with safer, less toxic alternatives when possible. Warnings are not enough to prevent pesticide illness.

# Looking Out for Heat Stress on Hot Days

A 50-year-old Spanish-speaking worker and his son have been working side by side for 15 days picking grapes. It is summer and the temperature is 102-103° F. During a ten-hour shift, the workers have only two ten-minute breaks and a 30-minute lunch. The father is told that he is picking too slowly, so he does not take the time to drink water.

Just before quitting time, the son notices his father does not look well. He is getting dizzy and lost in the rows. Then he begins vomiting, collapses, and becomes unconscious. Someone calls 911, but does not know the exact location of the workplace to tell the dispatcher. When the father shows some reaction to fanning, the son is asked to take his father home for rest and fresh air.

On the way home, the father's condition worsens, so they drive 45 minutes to reach the nearest emergency center. Medical staff try unsuccessfully to resuscitate the father. The coroner's report confirms that this worker's death was due to heat stroke.



**Providing shade helps to prevent heat illness.**

This case illustrates the devastating and potentially fatal effects heat illnesses have on California workers. OHB provides medical assistance to the California Division of Occupational Safety and Health (Cal/OSHA) to assess the causes of heat-related death or illness and recommend ways to prevent future casualties. OHB's review of Doctor's First Reports of Occupational Injury or Illness in 1999 and 2000 identified 28 cases of heat illness in the following industries: transportation, construction, service workers, manufacturing, and agriculture/forestry workers. It is likely that many heat illnesses were not reported.

Cal/OSHA requires employers to identify and control workplace hazards through an Injury and Illness Prevention Program (IIPP). Heat stress is an anticipated hazard for many workplaces in California. With an adequate heat stress prevention program, the progression from early heat

illness to fatal heat stroke should not occur. Because many of these deaths are among non-English-speaking workers, employers need to consider how language is addressed in the training, communication, and emergency response aspects of the IIPP.

Also, in the cases reviewed by OHB, heat-related symptoms were largely ignored or misinterpreted by workers and co-workers. Early recognition and appropriate actions may have prevented these deaths; however, once heat stroke sets in, reversing the damage is much more difficult.

## Steps to Preventing Heat Illness

### Recognize and Assess Hazards

- Determine which workers are at the highest risk of heat stress.
- Recognize that new workers, or those returning from a long absence, need time to acclimatize to working in heat.
- Frequently monitor the ambient temperature and develop ways to notify workers when it is rapidly increasing.

### Control the Hazards

- Train supervisors and workers on how to prevent heat stress and on the early symptoms of heat-related illness\*.
- Train workers on the individual health factors that can increase their risk\*.
- Provide for and enforce frequent intake of cool water.
- Provide sufficient rest breaks and access to a shady or cooled rest area.
- Encourage workers to wear appropriate clothing (lightweight long-sleeved shirt, long pants, and wide-brimmed hat).
- Use the buddy system for workers assigned to perform isolated job tasks.

### Be Ready to Respond to Emergencies

- Have a plan for responding to emergencies and ensure that supervisors and workers know what to do.
- Have supervisors trained in first aid and CPR onsite.
- If heat stroke is suspected (hot dry skin, confusion, convulsions, and unconsciousness), consider this a medical emergency and act promptly.
- Ensure that supervisors and workers know and are able to communicate to emergency personnel, or 911, the exact location of remote workplaces.
- Ensure that supervisors and workers know the location of the closest emergency facility capable of treating a heat illness victim.

\*For a training guide that covers this information, go to: [www.cdc.gov/elcosh/docs/d0200/d000261/d000261.pdf](http://www.cdc.gov/elcosh/docs/d0200/d000261/d000261.pdf).

# Local Partners Help “Get the Lead Out!”

OHB’s Occupational Lead Poisoning Prevention Program operates a registry of adult blood lead results in California.

Information from the registry helps us identify businesses and industries where workers are at risk for lead poisoning. Many lead-using companies in California are located in the Los Angeles area. Cases of lead poisoning in workers or their children continue to come from that region. In 2003, 47% of California workers with elevated blood lead levels (greater than 10 ug/dL) worked in Los Angeles County.

In 2002, OHB started a partnership with the Los Angeles County Department of Health Services to provide on-site assistance to help small businesses prevent lead poisoning.

Through our registry, case investigations, and outreach activities, OHB identifies companies that may need help improving their lead safety programs. The project’s local

health and safety specialist contacts the companies and provides free lead safety services. These include air

monitoring for lead, an assessment of the lead safety program, and referrals to useful resources. The project also provides employee lead safety training in English or Spanish that is tailored for each company.

Participating companies have made significant improvements in their lead safety programs. In-person visits by local health department staff provide direct feedback on whether employers are implementing required or recommended changes, or if more help is needed. Worker input from the trainings helps to refine prevention

measures, and the worker training motivates employees to participate fully in companies’ lead safety programs. The result – companies where employees and management are working together to achieve a lead-safe workplace.



Workers & trainer discuss shop hazards.

## 17-year-old dies when a forklift rolls over him

According to the U.S. Bureau of Labor Statistics (BLS), 760 U.S. workers under age 18 died from workplace injuries between 1992 and 2003, an average of 63 per year. Many factors increase the risk of injury or death among this population: young workers often perform tasks outside of their work assignments, may be unfamiliar with safe operating procedures, may not know their legal rights, and may lack the physical and emotional maturity needed for certain tasks. In the following case investigated by OHB, a 17-year-old victim was crushed by a forklift.

### What happened?

On the day of the incident, the victim had just reported for his first day of work. The manager planned to go over the victim’s duties and responsibilities with him when he returned from the bank. While the store manager was gone, the victim bagged purchased items and helped carry them out to the customer’s vehicle. The employee assigned to the cash register heard the forklift start up.

According to witnesses, the victim overheard a customer order three bales of hay and then decided on his own to get the bales using the forklift. The forklift was parked on the side of the store with the keys in the ignition, as was customary. The victim started the forklift and then drove to the other end of the yard where the hay was stacked. The hay bales were stacked seven bales high, so the victim raised the forklift mast and attempted to get the top bale. With the forklift mast raised high in the air, the victim backed the forklift over a rain gutter built into the asphalt yard. The victim lost control of the forklift and it overturned on its left side, pinning the victim as he attempted to jump free.

### What was learned?

- Ensure that employee orientation and safety training are given to employees before they begin work.
- Ensure employees under the age of 18 do not operate power-driven machinery. To accomplish this, employers should:
  - Establish a system to control access to power-driven machinery.
  - Store power machinery keys in a secure, monitored location.

To learn more about what employers need to know when hiring young workers, go to: [www.youngworkers.org](http://www.youngworkers.org).



This sticker can be obtained from the Wage and Hour Office of the U.S. Department of Labor.

---

# BuildSafe CA: Improving Tailgate Trainings

## BuildSafe Launched

Three years ago, representatives from construction companies and trade associations, unions, and public agencies helped OHB launch the BuildSafe California Project by providing input about how we could all work together to promote construction safety. They said that training and motivating contractors and foremen to conduct more effective tailgate trainings was a top priority. Contractors who do not do tailgate trainings, or who do them poorly, are missing out on what can be a powerful tool for jobsite safety.

OHB urged contractors to sign up for the training program on “Conducting Effective Tailgate Trainings” that we developed in collaboration with the State Compensation Insurance Fund and Cal/OSHA Consultation Service, along with the support of 15 contractor organizations and labor unions. We made the case that jobsite-specific tailgate trainings, where the crew members actively participate, are an effective way to promote workplace safety, get everyone’s “buy-in” around safety, reduce injuries and illnesses, and comply with Cal/OSHA training regulations.

From Eureka to San Diego, over 1,400 contractors, foremen, safety coordinators, and union representatives attended one of 24 half-day trainings to become more effective tailgate trainers. Eighty-six percent of the participants reported that the training was “very helpful.”

Participants were asked to consider four key questions when preparing for, or assessing, the effectiveness of a tailgate training:

- 1. Does the topic fit the job?** Make it relevant by talking about hazards the crew is facing, or about to face.
- 2. Does the crew participate?** Make it lively by having the crew contribute ideas, observations, stories, and solutions.
- 3. Do I demonstrate what I am talking about?** Make it real by showing and demonstrating the tool, equipment, or procedure. Get crew members to show how it is done.
- 4. Does the tailgate lead to action?** Make it matter by following up on good ideas. Focus on changes in the way the job is set up or run.

## Reaching the Right Audience

Having the right people attend the training is a real challenge. People who need the training because their job involves doing tailgate trainings are often the people who are least able to leave the jobsite. In some companies it is the foremen who do the trainings, but for others it is an office person who has many other tasks, including safety. OHB wanted to reach foremen but also people who are in a position to go back and train others to deliver tailgates, and we succeeded. Of 1,127 attendees from the first 21 trainings, there were: 267 foremen; 187 owners/CEOs/VPs; 160 managers/administrators; 154 superintendents; 142 safety directors; 127 project managers; and 90 others, including union representatives.

## Tailgate Trainings Improve

At the time of the BuildSafe CA training, attendees were asked how frequently they were doing tailgates. They were also asked to assess the quality of their tailgate trainings. Six months after each training, OHB asked the same questions along with some additional ones in a survey sent by mail or e-mail to the attendees of the first 18 trainings. Here is how 335 contractors responded to the follow-up survey about what had changed since they took the training:

- 63% said the effectiveness of their trainings increased.
- 38% said that workers raise safety concerns more often.
- 54% saw an increase in compliance with safety rules.
- 55% reported an increase in workers’ role in solving safety problems.
- 42% reported that the “Safety Break” tailgate training materials were very useful.

Of those contractors who were not originally doing tailgate trainings every ten days as required by Cal/OSHA, 77% increased their frequency. Also, 74% of respondents thought all contractors should be required to attend a basic health and safety training. Overall, they reported using the Safety Break cards and other materials provided, as well as utilizing their trainings as a way to solve jobsite safety problems jointly with the crew.

## SAFETY BREAK

Safety Break cards are to be used in short tailgate trainings along with the Cal/OSHA Pocket Guide for Construction. They address safety hazards and are written in a way to encourage discussion and problem solving among workers and supervisors. They cover a variety of topics, including ladder safety, trenching, and heat stress. To obtain the Safety Break cards in English and Spanish, and a list of other websites for construction health and safety resources, go to [www.dhs.ca.gov/ohb/buildsafe](http://www.dhs.ca.gov/ohb/buildsafe).

# Carpenters are Most Likely to Fall

Construction workers face many different health and safety risks. Falls are one of the most common types of injuries, and they are often very serious or even fatal. OHB is focusing on construction workers' falls from ladders through a statewide tracking project on nonfatal falls in construction. Fall cases were identified from Doctor's First Reports of Occupational Injury or Illness, a mandatory reporting system for work-related medical care.

OHB identified 4,357 falls from elevation in the California construction sector over a 2.5 year period, January 2001 to June 2003. Falls among carpenters were more common than for any other construction occupation, making up 18% of all construction falls. The most common type of fall among carpenters was from a ladder, accounting for 37%.

## Carpenter Falls by Type of Fall (1/01 - 6/03)

Type of Fall	%
Fall on and from ladder	37
Fall from, out of, or through building or structure	29
Fall on and from scaffolding	12
Other fall from one level to another	10
Unspecified fall	7
Fall from stairs or steps	4
Fall from platform/bench	1
Fall from scissor/boom lift	<1
<b>TOTAL</b>	<b>100</b>

In order to find out more about how falls from ladders occur and how they might be prevented, OHB completed telephone interviews of 209 construction workers who fell from ladders. Of those interviewed, 22% were carpenters. The findings presented below are drawn from these interviews of carpenters.

## Carpenters who Fell from Ladders

The typical carpenter who fell from a ladder was performing routine work tasks at the time of the fall (89% of cases), as opposed to a task that was not part of his/her normal duties. The average length of time in the trade was 11 years. The average height the carpenter was working at was seven feet (ranging up to 20 feet). Most carpenters who fell (74%) were using a step ladder, working for a general contractor building single family homes (71%), and most were non-union (90%). Spanish was the primary language spoken for more than one-third (37%) of the carpenters who fell.

## What Makes Using Ladders Risky

To determine the primary cause of each injury incident, we asked workers to describe the sequence of events related to their fall. Most workers reported that the ladder fell or slipped (59%); they lost their balance while on the ladder (28%); or there was a structural failure of the ladder (11%).

OHB's investigation found many different factors that increased the chance of falling from the ladder. They include:

- 72% of carpenters were working with both hands off of the ladder, so they were unable to maintain the recommended three points of contact (hands or feet) touching the ladder at all times.
- Carpenters were carrying heavy loads of tools or supplies – an average of 19 pounds – while on the ladder.
- Only 33% had attended training on ladder safety in the past year.
- 13% were facing outward rather than toward the ladder.
- Fewer than 5% of workers secured either the top or bottom of the ladder to prevent ladder movement during use.
- 97% of step ladder falls occurred while performing work, rather than inspecting work. Usually it is safer to work from a more stable surface such as scaffolding or a scissor lift.
- 20% of workers were using a step ladder incorrectly, in a closed position.

## Opportunities for Prevention

When asked, most workers (82%) thought that the fall incident was preventable. Interestingly, 40% of the workers thought that an alternate piece of equipment could have been used, including mobile scaffolds and other work platforms.

In each worksite setting, the tasks that are performed from ladders should be evaluated for safety to determine:

- The best piece of access equipment to select for the task.
- If the task can be performed while the worker follows the basic ladder safety guidelines.
- The best way to secure the top and/or bottom of extension ladders.

For tailgate training materials in English and Spanish on preventing falls while using extension or step ladders, use OHB's Safety Break Cards (see page 6).



**Keeping 3 points of contact with the ladder helps to prevent falls.**

# Down In the Trenches to Prevent Cave-Ins

Unprotected trenches are dangerous places for workers to be. If unstable walls start caving in, a worker can be buried within seconds. Since a cubic yard of dirt can weigh over one and a half tons, a buried worker can easily be killed or severely injured before he can be dug out. Besides cave-ins, other serious hazards are found in trenching work, including hitting unmarked electric or gas lines, being struck by a falling object, and getting run over by heavy equipment.

## Digging Deeper to Find Solutions

OHB worked with colleagues from the University of California (Berkeley and San Francisco) to investigate why trenching injuries occur and what more can be done to prevent them. The Center to Protect Workers' Rights and NIOSH provided partial funding for this project.

The researchers obtained information from:

- Data on trenching injuries and investigations of fatal or serious injury incidents;
- Interviews with experts in industry, labor, academia, and government;
- Jobsite visits to observe trench protective systems used and interview crew members; and
- Reviewing available trench safety training materials.

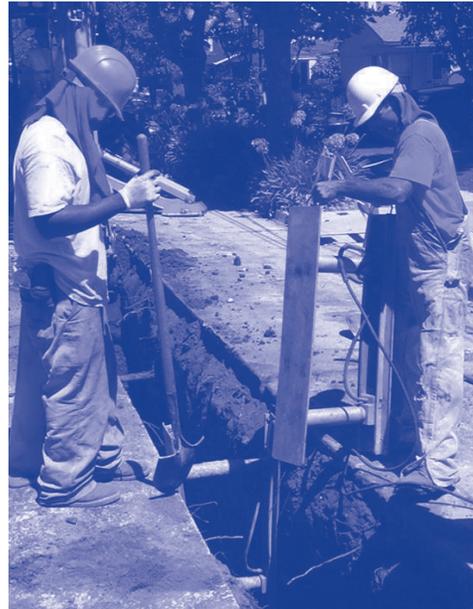
We also made contact with California organizations who might partner with OHB on a future project to improve trench safety. These include trade associations, labor unions, trench equipment vendors, safety trainers, and Cal/OSHA.

## Why Injuries Occur

The investigation data and the experts we spoke with agreed on one overall conclusion—if all employers followed the Cal/OSHA excavation standard, most injuries and deaths due to trenching would not occur.

The standard requires every excavation jobsite to have a trained “competent person” who inspects for hazards and ensures they are corrected. Any trench five feet or greater that a worker will enter must be protected by one of the methods known to prevent cave-ins (shoring, boxes or shields, sloping/benching). The employer must also have a Cal/OSHA permit.

Investigation of injury incidents shows that the risk is greatest among smaller, non-union employers who do not



Workers installing hydraulic shoring.

know enough about the hazards and how to control them or just do not comply with the standard. They may not have a trained competent person or provide training to workers. We estimate that 81% of California companies doing excavation have fewer than 20 employees.

## Room for Improvement

Our interviews produced many ideas about what should be done to improve trench safety. They include:

- *More targeted enforcement* – Many industry and labor representatives supported more resources for Cal/OSHA inspectors to go out and find unprotected trenches. Activities to increase referrals of unsafe jobs to Cal/OSHA were suggested.
- *Policy improvements* – We identified policies used successfully in other states, such as a requirement making trench protective systems a separate bid item in all public works jobs. This ensures that contractors are planning ahead for the cost of these items.
- *More and better training* – Employers need to know the hazards and Cal/OSHA requirements, competent persons must have the skills to recognize and control hazards, and trench crew workers must know never to enter an unprotected trench. Training should be tailored to the audience, include hands-on activities, and be affordable and accessible for smaller employers.

Our findings suggest that combining improved education with a stronger motivator is likely to be more effective than a training-based approach alone. OHB hopes to partner with others in future efforts to improve trench safety. A project report will be available at OHB's website.

### **Best Practices for Trench Safety**

- Top management makes safety a priority;
- Job bids and planning include trench protection;
- A trained competent person inspects frequently and takes action to ensure protection; and
- Crews are well-trained in hazard recognition and encouraged to raise safety issues.

# Push for Better Protection Against Asthma

Currently, there is no consistently-used, science-based method for setting protective workplace exposure limits for chemicals and other agents that cause asthma. As a result, asthma-causing agents in the workplace are not readily identified and controlled, and their contribution to the overall incidence of asthma is often unrecognized.

One problem is that chemicals known to cause asthma remain unregulated in the workplace. For example, studies now show that polymers of isocyanates in auto body paint products can cause asthma that is similar to asthma caused by toluene diisocyanate (TDI), an isocyanate monomer. TDI and other monomers are regulated and have largely been replaced in most industrial applications by polymeric isocyanates which were thought to be safer. But permissible exposure limits have never been set for polymeric isocyanates, despite being in use for over 20 years.

The workplace standards that do exist for agents that are recognized as causing asthma are inconsistent. The standard that was set for formaldehyde includes medical surveillance to detect early signs of asthma and medical removal for affected workers. However, similar protections do not exist for workers exposed to other regulated asthma-causing chemicals.

To help address these problems, OHB is collaborating with the DHS Environmental Health Investigations Branch on a project funded by the Centers for Disease Control and Prevention. The first goal of the project is to develop a “white paper” that proposes a science-based, consistently-applied policy to protect workers exposed to agents that cause asthma.

The white paper will lay out the existing methods used to establish workplace exposure levels for agents that cause asthma; describe why the current lack of a consistent, science-based policy fails to protect workers and community residents; and recommend establishing a precautionary, prevention-based approach. The white paper will be disseminated to labor and industry representatives, clinicians, and governmental and non-governmental organizations involved in asthma prevention activities.

The second goal is to strengthen the linkages between environmental and occupational asthma prevention activities. We will show that effective control of asthma-causing agents used in workplaces can reduce harmful emissions into surrounding communities, protect patients and others in hospitals and other indoor environments, and can lead to the development of safer substitutes.

## Five More Years to Focus on Workplace Asthma

OHB has had an ongoing program to track and prevent work-related asthma since 1993. With funding from NIOSH, OHB uses statewide physician reports to identify when workers experience new asthma, or flare-ups of existing asthma, on the job. We interview these workers by telephone, and analyze the data to understand the risk factors for work-related asthma and strategies for prevention. Project staff may visit worksites to gather additional information and make recommendations for prevention. OHB collaborates with and provides information about work-related asthma to workers, employers, trade associations, unions, and others.

Since 1993, OHB has identified over 3,500 individuals with work-related asthma statewide. However, a survey of Californians conducted in 2001 estimated that at least 137,000 people have asthma associated with their work. This suggests that the current tracking system is only capturing a fraction of existing asthma cases. OHB is planning to use additional data sources to expand its reach, including workers' compensation claims, hospital discharges, and emergency room visits.

OHB has focused on prevention by producing publications addressing asthma risks from wood dust,



**Some auto paints can cause asthma.**

graffiti-removing chemicals, and other cleaners. These publications have been distributed to thousands of workers and employers, and are available for free by mail or on our website: [www.dhs.ca.gov/ohb/OHSEP/asthma.htm](http://www.dhs.ca.gov/ohb/OHSEP/asthma.htm). We have also evaluated workplace processes in a variety of settings, including egg processing, graffiti removal, lumber manufacturing, heart valve manufacturing, medical waste processing, and statuette manufacturing, in order to determine the risk factors for work-related asthma and develop effective prevention guidance.

Our work has been rewarded: OHB just received an award from NIOSH to fund the program for five more years, ensuring that this important public health problem in California continues to be addressed.

# New Workplace Lead Program Leadership



In December 2004, we welcomed our new Occupational Lead Poisoning Prevention Program (OLPPP) Chief, Dr. Michael J. DiBartolomeis. Dr. DiBartolomeis, a toxicologist by training, came to us from the Office of Environmental Health Hazard Assessment in the California Environmental Protection Agency. While there, he managed programs on safe

pesticide use and provided guidance on integrating the principles of environmental justice into governmental environmental decision-making.

OLPPP's primary mission is to provide information and services to prevent and control lead poisoning in California workplaces. Our activities are directed toward workers,

unions, employers, industry groups, health professionals, and the general public. In keeping with this mission, Dr. DiBartolomeis has engaged staff in planning strategies to:

- ensure that high-quality data are collected to guide workplace lead poisoning prevention;
- expand the scope of our outreach and education activities to lead workplaces; and
- strengthen our efforts to protect workers and their family members from both short- and long-term health effects from lead exposure.

Of course, maintaining a healthy working environment is far more complicated than addressing exposure to a single chemical. Therefore, OLPPP is developing goals and strategies to protect lead workers from harm due to exposure to other toxic heavy metals and chemicals, as well as safety hazards. We will continue to work with both employers and employees to achieve these goals.

## Tree Trimmer Pulled into Wood Chipper

### What happened?

Tree damage from storms and routine tree-trimming operations prompt the need for disposing of branches and brush. Mobile wood chippers shred branches and tree trimmings into mulch. Branches are fed into a chute, in which rotating blades macerate the wood. The BLS Census of Fatal Occupational Injuries reported a total of 31 U.S. worker deaths that were attributable to mobile chippers from 1992-2002.

In one case investigated by OHB, a 33-year-old male tree trimmer died when he was drawn entirely into a brush chipper. The site of the incident was a parking lot of an office complex where trees around the perimeter were to be trimmed. On the day of the incident, nine employees reported to the work location and started the job by holding a tailgate safety meeting. The victim's duties were to drive the large diesel truck to the stacked limbs and brush, and feed them into the chipper. The chipper was attached to the rear of the truck with its chute aimed into the bed of the truck through an open section in the tailgate. Co-workers stated they heard a strange noise coming from the chipper, and the supervisor found the victim when he went to investigate.

There were no witnesses to the actual incident, but the police concluded that the victim either lost his balance while feeding the trimmings into the chipper and was pulled into the chipper blades, or was leaning across the feed table attempting to push the trimmings into the chipper when his gloves caught on the feeder rollers and he was pulled into the chipper blades.

### What was learned?

- Ensure that all employees use a long limb, branch, or a push stick to feed small trimmings into the brush chippers.
- Ensure that all employees stand to the side of the feed table when feeding trimmings into the chipper.
- Designate another employee as a safety watch when trimmings are being fed into the chipper. This person may have been able to intervene verbally or activate the quick-stop device before the victim made contact with the chipper blades.



# Using Safer Automotive Cleaners

Every year more than four million spray cans or bottles of aerosol automotive cleaners are sold in California. They are used in over 31,000 auto repair shops to clean brakes and carburetors, to degrease engines, and for general purpose degreasing. Many of these aerosol cleaners contain toxic solvents that can cause cancer, reproductive damage, and other long-term health effects.

Some improvements have been made such as the California Air Resources Board ban on the cancer-causing solvents methylene chloride, perchloroethylene, and trichloroethylene, and the removal of hexane, following OHB's health advisory that warned of new cases of nerve damage among mechanics.

But most aerosol cleaners still contain toxic solvents, and other hazards still need to be addressed. Diesel exhaust and asbestos also pose health hazards, and repetitive use of tools and unsafe jack stands can cause disabling injuries.

## What We Did

To address the problems with aerosol products, OHB collaborated with a non-profit organization, the Institute for Research and Technical Assistance, on a study funded by the U. S. Environmental Protection Agency. Working with 18 auto repair shops, we identified and tested safer, alternative aerosol cleaners to see if they were effective substitutes for the more toxic cleaners the shops were using.

To learn more about health and safety hazards and workers' compensation claims in the industry, we reviewed data from Cal/OSHA inspections and a large California insurer. We also interviewed auto repair shop employers, members of the International Association of Machinists and Aerospace Workers, local hazardous materials inspectors, and others.

Our purpose was to learn about current practices and knowledge regarding use of automotive cleaners; effective ways to promote the safer aerosol cleaners; and how to develop comprehensive approaches to help employers prevent injury, illness, and pollution from auto repair hazards.

## What We Learned

Our study showed that water-based aerosol cleaners work as well as solvent-based aerosols for cleaning brakes, degreasing engines, and for general purpose cleaning, and that the costs of the cleaners are comparable. We also found that aerosol cleaners formulated with soy and acetone are effective, safer alternatives for cleaning carburetors or fuel injection intakes.

Interviews with key auto industry representatives reinforced the need for safer aerosol cleaners. We learned that shops are using many products that contain a variety of toxic solvents. Workers and employers appear to have limited knowledge of the health effects of the solvents, and many are not aware of key workplace regulations on the use of toxic materials.

We learned that automotive repair industry workers' compensation costs for a large California insurer, from 1993 to 2002, were approximately \$60 million for over 10,000 claims. From 1993 to 2003, Cal/OSHA inspected 520 auto repair shops and

cited a total of 1,729 violations in 411 of the shops. Seventeen percent of the inspections were in response to serious injuries, and the average penalty was \$3,253. Informing the industry of these facts should emphasize the importance of implementing strategies to prevent injuries and illnesses.

## Spreading the Word

OHB is working with local hazardous materials inspectors, Cal/OSHA, Cal/EPA, and others to distribute two new educational publications to workers and employers in auto repair shops across the state.

*Aerosol Cleaner Use in Auto Repair* explains the short- and long-term health effects of toxic solvents found in many aerosol automotive cleaners, and promotes the use of safer, alternative cleaners to protect the health of workers and community residents. *Injury, Illness, & Pollution Prevention in Auto Repair* discusses common health and safety hazards, their costs, and how to develop and implement a comprehensive plan to protect health and the environment.



**Aerosol cleaners can contain toxic chemicals.**

Arnold Schwarzenegger, Governor  
 State of California  
 Kimberly Belshé, Secretary  
 Health and Human Services Agency  
 Sandra Shewry, Director  
 Department of Health Services



## *Occupational Health and Safety - A publication on worker health and safety in California!*



Tel. (510) 620-5757  
 Fax (510) 620-5743  
[www.dhs.ca.gov/ohb](http://www.dhs.ca.gov/ohb)

California Department of Health Services  
 Occupational Health Branch  
 850 Marina Bay Parkway  
 Building P, 3rd Floor  
 Richmond, CA 94804-6403

<p align="center"><b>Occupational Health Branch Mission Statement</b></p> <p>To promote a safe and healthy work environment for all Californians through a comprehensive and effective program of prevention activities, public health leadership, scientific excellence, and collaboration with stakeholders.</p>	<p align="center"><b>A sample of OHB publications online at <a href="http://www.dhs.ca.gov/ohb">www.dhs.ca.gov/ohb</a></b></p>
<p align="center"><b>OHB Public Information Lines</b></p> <p><b>OHB Reception Desk (510) 620-5757</b>                  For general information or to add your name to this publication's mailing list.</p> <p align="center"><b>Toll-free to California callers:</b></p> <p><b>Workplace Hazard Helpline (866) 282-5516</b>                  Provides information to assist in identifying, understanding, and preventing workplace health and safety hazards.</p> <p><b>Lead in the Workplace Information Line (866) 627-1587</b>                  Provides information in English or Spanish about work-related lead poisoning and how to prevent it.</p> <p><b>Pesticide Poisoning Helpline (800) 970-6680</b>                  Provides information to assist in identifying and preventing work-related pesticide poisoning.</p>	<p><b>Fact Sheets on Preventing Fatalities</b></p> <ul style="list-style-type: none"> <li>• Tree Trimmer Killed! Pulled Through Wood Chipper</li> <li>• Two Mechanics Electrocuted! Crane Boom Contacts High Voltage Line</li> <li>• Youth Killed in Forklift Rollover!</li> </ul> <p><b>Resources for Auto Repair</b></p> <ul style="list-style-type: none"> <li>• Aerosol Cleaner Use in Auto Repair</li> <li>• Injury, Illness, &amp; Pollution Prevention in Auto Repair</li> </ul>
	<p>To obtain a copy of this document in an alternate format, please contact:                  OHB at (510) 620-5757                  or CA Relay Service at (800) 735-2929                  Please allow at least ten working days to coordinate alternate format services.</p>