Beating the Heat

Heat-related illnesses are vastly under recognized and underreported. Are you taking effective measures to help employees beat the heat?

Last summer, when much of the United States suffered its most intense heat wave in a decade, a Minnesota cattleman awoke to a radio advisory urging farmers to keep their cattle out of the sun because, with a forecasted heat index of 110, it was too hot even for grazing. In response, the cattleman started his day by turning on the sprinklers in his barn, dousing his cows with hundreds of gallons of water while circulating the air with massive fans. His philosophy: "You have to treat the cows like you treat yourself."
Unfortunately, not all employers recognize how deadly the combination of heat and humidity can be to their workers, and take steps to protect them. Likewise, not all workers recognize how vulnerable their bodies are to extreme temperatures and look out for themselves and their coworkers.
During 2001, excessive heat exposure caused 24 worker deaths and 3,135 occupational injuries and illnesses involving days away from work, according to the Bureau of Labor Statistics. These numbers were up from the previous year, when 21 workers died and 2,254 lost workdays due to heat-related injuries and illnesses occurred. Despite these alarming statistics, state and federal agencies estimate that heat-related illnesses are vastly under recognized and underreported.

Many workers, including those in foundries, laundries, bakeries and restaurants, face hot working conditions year-round. During hot-weather months, these conditions can become stifling, despite efforts to cool the area with air conditioners, fans or open windows.
For people who work outside, particularly those involved in heavy labor such as construction, roofing and farming, blazing summer temperatures can be especially unforgiving.

Consider the 36-year-old man who stopped dismantling a car at a Tilton, Ill., auto salvage shop last summer, complaining he felt overheated. His coworkers summoned emergency help, but he died less than an hour later. Or the 58-year-old restaurant worker in Aurora, Ohio, who collapsed after cleaning a patio area. Despite emergency worker's efforts to revive him, he was pronounced dead in the hospital emergency room with a core body temperature of 107 degrees. Or the highly publicized case of 27-year-old Minnesota Vikings tackle Korey Stringer, who collapsed last July after morning practice during the second day of training camp and later died of heatstroke.

The Body's Response

When exposed to severe heat, the body works to maintain a fairly constant internal temperature. It increases blood flow to the skin, where it releases excess heat. The body produces sweat that, when it evaporates, cools the skin.
But in extreme conditions, this process doesn't work as nature planned. When muscles are being used for physical labor, less blood is available to flow to the skin and release body heat. And sweat doesn't evaporate from the skin

in high humidity. The body can't release excess heat, so its core temperature rises and the heart rate increases.

As a result, the person starts to lose concentration and has difficulty focusing on tasks. Some people begin to feel sick or irritable and lose the desire for the fluids they so desperately need. Some may faint or even die if they do not receive immediate care to lower their body temperature.
Not everyone reacts equally to heat. A worker's age, weight, fitness level and medical condition play a role. Low-sodium diets, consumption of alcohol or caffeine, and some medications increase the risk. Toxicology tests on Baltimore Orioles pitcher Steve Bechler, who collapsed during a spring training workout in February and died the next day of heatstroke, identified several contributing factors: use of an over-the-counter dietary supplement, excess weight, hypertension, abnormal liver function and the warm Florida climate.

Acclimation is another important factor. The first days in a hot environment are generally the hardest on workers, and when heat-related injuries frequently occur. That was the case for a 44-year-old construction laborer who had just returned to work in Bossier, La., last summer after a four-day holiday. Working in 95- to 97-degree temperatures, he collapsed and later died of heat exhaustion.

Most workers are able to work with less strain and stress following an adjustment period of five to seven days. However, their bodies must be reacclimated after an absence from the hot environment, such as after they take a vacation.

Prevention Saves Lives

As severe as heat-related injuries can be, Trese Louie, a safety and health specialist in OSHA's Directorate of Science, Technology and Medicine, says they are among the most preventable. She urges workers to drink plenty of water - from five to seven ounces every 15 to 20 minutes - to replace the two to three gallons of sweat they may lose during a workday. She also encourages workers to take short but frequent breaks from their work in a cool, shady area. And whenever possible, she recommends employers alter work hours so employees do their most demanding physical work before or after the hottest hours of the day.
Keith Piercy, a compliance safety and health officer in OSHA's Tampa, Fla., area office, says employers at most of the worksites he inspects "do a very good job" of providing their workers plenty of water and electrolyte drinks in hot weather. Some employers go the extra measure, offering their workers special-filled scarfs that, when soaked in water and wrapped around their necks, help cool their bodies, or have misting stations, like those used to cool professional football players.
Yet Piercy says he notices two areas where some employers are missing the mark. Although they may encourage workers to take more frequent breaks in particularly hot weather, they often do not set aside a cooler or shaded area for those breaks - meaning that the workers are not able to cool themselves effectively before returning to work.
And although many of the larger companies Piercy visits take steps to teach their workers about heat-related illnesses, he says some of the smaller companies fall short on education. "What employers aren't always good at is impressing on their employees how much caffeine and alcohol affect their ability to work in the heat," he says, "or the benefit of wearing lighter-colored clothing that reflects heat instead of absorbing it."

Louie says worker education is key in helping prevent heat injuries at work. "Workers need to know how to avoid heat injuries and how to recognize signs of heat stress not only in themselves, but in their coworkers, too, she says. "By looking out for each other, they can help protect each other. "Heat-related injuries take their toll on too many workers," says Louie. "With increased awareness and some basic precautions, many of these illnesses and deaths can be prevented.

Sidebar 1: Types of Heat Stress

Heat cramps - Mild. Results from dehydration and a slight imbalance in electrolytes. Victims respond well to rest and rehydration with fluids.
Heat exhaustion - More severe. Involves removing the person from the hot environment to a cool, shaded location and rehydrating with cool fluids if drinking water does not relieve the condition.
Heat stroke - Most severe. A medical emergency requiring extensive intervention and support. Occurs most often when workers perform strenuous work in hot, humid weather for an extended period.

Sidebar 2: How to Protect Workers

1) Encourage workers to drink plenty of water - about a cup of water every 15 to 20 minutes, even if they are not thirsty - and avoid alcohol, coffee, tea and caffeinated soft drinks that dehydrate the body.

2) Help workers adjust to the heat by assigning a lighter workload and longer rest periods for the first five to seven days of intense heat. This process needs to start all over again when a worker returns from vacation or absence from the job.

3) Encourage workers to wear lightweight, light-colored, loose-fitting clothing. Workers should change their clothes if they get completely saturated.

4) Use general ventilation and spot cooling at points of high heat production. Good airflow increases evaporation and cooling of the skin.

5) Train first-aid workers to recognize and treat the signs of heat stress and be sure all workers know who has been trained to detect early signs of heat-related illness. Permit workers to interrupt their work if they become extremely uncomfortable.

6) Consider a worker's physical condition when determining fitness to work in hot environments. Obesity, lack of conditioning, pregnancy and inadequate rest can increase susceptibility to heat stress.

7) Alternate work and rest periods, with rest periods in a cooler area. Shorter, more frequent work-rest cycles are best. Schedule heavy work for cooler times of the day and use appropriate protective clothing.

8) Monitor temperatures, humidity and workers' responses to heat at least hourly.

Sidebar 3: Heat Stress Card

OSHA's Heat Stress Card is available in both English and Spanish (OSHA 3154 and 3155, respectively). These laminated, fold-up cards, available free to employers to distribute to their workers, provide a quick reference about heat-related injuries, including warning signs and prevention tips. Employers can order the cards through the OSHA Web site at www.osha.gov, which also provides additional information about heat-related injuries. Donna Miles is managing editor of the Occupational Safety and Health Administration's publication, Job Safety and Health Quarterly.