



Preventing Heat-Related Illness in Workers

The average temperature and the number of very hot days (at or above 90° F) in Pennsylvania are going up. **As Pennsylvania has more very hot days, workers are more likely to experience heat-related health problems.** It is important for employers to understand heat-related health issues and adopt measures to keep their workers safe from extreme heat.

EXTREME HEAT HEALTH IMPACTS

Heat-related injury or illness can affect people in various ways. Some workers may be more vulnerable depending on their overall health, how accustomed they are to the heat (acclimatization), use of alcohol or medications, pregnancy, and other personal factors. Signs of a heat-related condition can include the following symptoms:

- Heavy sweating, followed by no sweating
- Headache
- Extreme thirst
- Rash
- Muscle cramps
- Nausea
- Dizziness, confusion, or fainting
- Reduced physical or mental abilities
- Elevated body temperature

Anyone experiencing these symptoms should get out of the hot area, drink fluids, and seek medical help.

MONITORING FOR EXTREME HEAT CONDITIONS

To stay safe in extreme heat, it's important to measure how hot conditions will feel for workers. The following tools from the National Weather Service (NWS) and the Environmental Protection Agency (EPA) can be used to monitor heat conditions:

- The [heat index](#) is the “feels like” temperature, and accounts for air temperature and humidity. The heat index is present on most smartphone weather applications.
- The [HeatRisk score](#) accounts for how abnormal a temperature is for the time of year, total heat duration, and whether temperatures are above heat-health thresholds.
- The [wet bulb globe temperature \(WBGT\)](#) is a measure of the heat stress in direct sunlight which accounts for temperature, humidity, wind speed, sun angle, and cloud cover. The WBGT is the Occupational Safety and Health Administration’s (OSHA) preferred measure for assessing heat risk. More details can be found in [OSHA’s Heat Stress Technical Manual](#).
- Air quality is often poor when it is very hot and should be monitored along with the heat. The EPA regularly monitors regional air quality using the [Air Quality Index \(AQI\)](#).

PREVENTING HEAT-RELATED ILLNESS IN WORKERS

Employers can lower workplace heat stress by using fans, providing shade, giving workers reflective clothing, limiting time in the heat, [and more](#). Employers should track at least one heat measurement like WBGT, HeatRisk, or heat index to know when local working conditions are risky. If conditions are risky, scheduling and workflow modifications should be made to protect workers. Additionally, it is critical to acclimatize workers by gradually exposing them to extreme heat to help their bodies adapt.



Figure 2 (below) from [Oklahoma's Weather Network](#) provides an approach to schedule modification based on the WBGT-defined conditions, level of worker acclimatization, and physical intensity of the work.

Wet Bulb Globe Temperature Category Work/Rest and Water Intake								
Unacclimated and Acclimated Work/Rest and Water Intake Chart								
Heat Risk Category		Wet Bulb Globe Temp	Light Work		Moderate Work		Heavy Work	
			Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)
No Risk	Unacclimated	78 – 79.9	50/10 min	½	40/20 min	¾	30/30 min	¾
	Acclimated	78 – 79.9	continuous	½	continuous	¾	50/10 min	¾
Low	Unacclimated	80 – 84.9	40/20 min	½	30/30 min	¾	20/40 min	1
	Acclimated	80 – 84.9	continuous	½	50/10 min	¾	40/20 min	1
Moderate	Unacclimated	85 – 87.9	30/30 min	¾	20/40 min	¾	10/50 min	1
	Acclimated	85 – 87.9	continuous	¾	40/20 min	¾	30/30 min	1
High	Unacclimated	88 – 90	20/40 min	¾	10/50 min	¾	avoid	1
	Acclimated	88 – 90	continuous	¾	30/30 min	¾	20/40 min	1
Extreme	Unacclimated	> 90	10/50 min	1	avoid	1	avoid	1
	Acclimated	> 90	50/10 min	1	20/40 min	1	10/50 min	1

Adapted from: 1) USGS Survey Manual, Management of Occupational Heat Stress, Chapter 45, Appendix A. 2) Manual of Naval Preventive Medicine, Chapter 3: Prevention of Heat and Cold Stress Injuries. 3) OSHA Technical Manual Section III: Chapter 4 Heat Stress. 4) National Weather Service Tulsa Forecast Office, Wet Bulb Globe Temperature.

FIGURE 1: WET BULB GLOBE TEMPERATURE INFORMED WORK SCHEDULE

RECOMMENDATIONS FOR EMPLOYERS

- Use tools like **WBGT, HeatRisk score, or heat index** to identify days with high heat stress risk. Also, check daily air quality with the **AQI**.
- Minimize heat at work by implementing a heat-stress safety protocol and acclimatization program.
- Ensure workers are trained to operate in days of extreme heat by **modifying schedules, staying hydrated**, working according to acclimatization, and recognizing early heat-related illness in themselves and others.
- Recognize that symptoms of heat-related illness can include fatigue, cramps, heavy sweating or lack of sweating, rash, dizziness, nausea, or fainting. **Left untreated, heat-related illness can result in coma or death.**
- If a worker experiences symptoms, **remove them from the heat and seek medical care.**

CONTACT US

If you have any questions or concerns about protecting workers from heat related illnesses, please contact the Division of Environmental Health Epidemiology at the PA DOH by calling 717-787-3350 or emailing us at dehe@pa.gov.