Protecting New Workers from Heat

OSHA has found that:

- Almost half of heat-related deaths occur on a worker's very first day on the job (Arbury 2014).
- Over 70 percent of heat-related deaths occur during a worker's first week (Tustin 2018).

These tragedies can be avoided if you take actions to protect new workers.

The types of "new workers" who need to be protected are:

- New, temporary, or existing employees who start new work activities:
  - in warm or hot environments
  - while wearing additional clothing (e.g., chemical protective clothing)
  - with increased physical activity
- Workers returning to work environments with potential exposure to heat hazards after an absence of one week or more; for example, returning from any kind of extended leave.
- Workers who continue working through seasonal changes when temperatures first begin to increase in the spring or early summer.
- Workers who work on days when the weather is significantly warmer than on previous days (i.e., heat wave).
- In all examples above, the workers may not be used to the heat loads on that day. The above workers are at increased risk of heat-related illness because of physiological (i.e., related to body function and exertion) and/or behavioral factors.

Build Heat Tolerance: Acclimatization

The term "acclimatization" means that the body gradually adapts and tolerates higher levels of heat stress. Workers who are new to working in warm environments may not be acclimatized to heat. Their bodies need time to adapt to working in hot conditions. Acclimatization results from the following changes in the way the body works:

- Body produces more sweat → more evaporative cooling
- Sweat contains less salt loss → less likely to develop electrolyte imbalances and heat cramps
- Body is more efficient at getting rid of heat → slower heart rate and slower body temperature increase
- More blood flows to the skin → more efficient cooling through the skin

Other factors that are different from person to person (e.g., general physical fitness) may affect the acclimatization process.

GO SunSmart Georgia

Unacclimatized Workers	Acclimatized Workers
Do not sweat efficiently.	Sweating rate is higher, which helps dissipate heat through evaporative cooling.
Sweat contains more salt.	Sweat contains less salt, which prevents development of electrolyte imbalances.
Body temperature and heart rate increase more quickly when working.	Maintain lower body temperature and heart rate.
Blood flow not optimized for heat dissipation.	Increased blood flow to skin to lose heat through body surface.

The first days of a new job or a new work activity can contain unique psychological and behavioral pressures. While every situation is different, some new workers may be at greater risk because they:

- Push their bodies excessively hard to demonstrate that they can do the work.
- Do not yet know how to perform physical tasks efficiently to conserve energy.
- Do not recognize the importance of taking breaks and drinking plenty of fluids.
- Ignore heat-related symptoms or continue working despite symptoms.

Acclimatization, resting, drinking water, and finding shade take time. Some new workers experience self-generated or external expectations and pressures. The first days of a new job or a new work activity might lead to the following thoughts and/or actions, all of which are dangerous when heat stress is present:

Protection Strategies: Establishing a Culture of Acclimatization

To protect new workers from heat-related illness, you should do the following:

- Schedule new workers to work shorter amounts of time working in the heat, separated by breaks, in heat stress conditions (see below).
- Give new workers more frequent rest breaks.
- Train new workers about heat stress, symptoms of heat-related illness, and the importance of rest and water.
- Monitor new workers closely for any symptoms of heat-related illness.
- Use a buddy system and don't allow new workers to work alone.
- If new workers talk about or show any symptoms, allow them to stop working. Initiate first aid. Never leave someone alone who is experiencing symptoms!

These increased precautions should last for 1-2 weeks. After that time, new workers should be acclimatized to the heat and can safely work a normal schedule.

Work Duration for New Workers

New workers need time to acclimatize unless they have previously worked in hot environments. To prevent heat-related illnesses, they should work shorter workdays in the heat during their first 1-2 weeks. OSHA and NIOSH recommend the "Rule of 20 *percent*" for building heat tolerance:

- *20 percent First Day*: New workers should work only 20 *percent* of the normal duration on their first day.
- *20 percent Each Additional Day*: Increase work duration by 20 *percent* on subsequent days until the worker is performing a normal schedule.

For example, if the normal workday lasts 8 hours, then new workers should work no more than 1 hour and 40 minutes (20 *percent* of 8 hours) on their first day in the heat. They can spend the rest of the workday without heat stress. They should be given at least one rest break during the period when they are working.

By following the Rule of 20 *Percent*, new workers will be working a full schedule by the end of their first week. The Rule of 20 *Percent* should protect most workers who are physically fit and have no medical problems. Other workers may require more time to adapt to heat – up to 14 days in some cases. When in doubt, give workers more days to acclimatize. As the duration of work increases, workers will need more rest breaks to recover from the heat load.

To become acclimatized to heat, workers should perform job tasks that are similar in intensity to their expected work. Doing light work may not acclimatize a worker to the demands of their job.

Remember, to help workers build heat tolerance, reduce the **duration** of the work but not the intensity of the work.

Sources:

- Occupational Safety and Health Administration (OSHA). Heat: protecting new workers. https://www.osha.gov/heat-exposure/protecting-new-workers.
- Arbury et al. Heat illness and death among workers—United States, 2012-2013. MMWR Morbidity and Mortality Weekly Report 2014;63(31):661-665.
- Tustin AW, Cannon DL, Arbury SB, Thomas RJ, Hodgson MJ. Risk factors for heat-related illness in U.S. workers: an OSHA case series. J Occup Environ Med. 2018 Aug;60(8):e383-e389.