



Bring on the Heat!



By Drew Hinton, President/CEO of Arrow Safety, LLC

As temperatures are quickly ramping up and with many parts of the country already experiencing heat indexes above 90°F, we need to begin to prepare ourselves for the risk of heat stress, both in and out of the workplace.

Background Information

The human body is constantly trying to find balance by regulating internal and external variables. Maintaining a normal body temperature of 98.6°F is important to ensure the body functions properly. Heat waves cause stress on the body when too much heat is being absorbed and not enough heat is being lost through the body's normal cooling processes. When this happens, the body's means of controlling its internal temperature begins to fail. Once the core body temperature reaches 99.7°F, heat stress begins to affect the body. Just 30 minutes of exposure at a core body temperature of 104°F or higher is enough to cause permanent disability or brain damage.

Heat-related illness is a problem for many types of workers: **metal smelters, outdoor construction and law enforcement workers, plastics manufacturing workers, landscaping and recreation maintenance personnel, staff in warehouses without air conditioning, cooks and kitchen workers, and athletes.** A number of human factors contribute to a worker's susceptibility to heat stress, such as **medical conditions, increasing age, overall level of fitness, presence of other metabolically stressful illnesses, the use of certain medications, dehydration, alcohol intake, and individual ability to acclimatize to extreme temperatures.** Environmental factors that can contribute to heat stress besides high ambient temperature are **low convection currents, high humidity, low evaporative loss, and high insulation levels around the body.**



Here are several measures to help workers stay safe in hot conditions:

- Provide workers and supervisors with heat stress and applicable first aid training.
- Review your company's Heat Stress policy and applicable emergency action plans (EAPs) so everyone knows what to do in the event of a crisis.
- Set acceptable exposure times and allow employees sufficient recovery time in cooler areas, such as an air-conditioned break room or shaded rest area.
- Limit exposure time and/or increase recovery time in cool conditions.
- Provide an adequate supply of cool water and encourage frequent consumption (1 cup every 20 min).
 - On a daily basis, workers should consume at least half their body weight in ounces of water. For example, a 200 lb. person should drink at least 100 oz. of water during a 24-hour period. However, your water intake level should increase as your level of physical activity increases.

- Increase the number of workers per task so that there is a decreased level of physical exertion per employee and the task can get completed quicker, therefore reducing the total exposure time.
- Give new and back-to-work employees time to acclimate. Just because indoor work settings typically have a more predictable temperature than those working outdoors doesn't mean that certain individuals don't need time to acclimate to the environment. **Acclimatization is one of the most important steps an employer can take to ensure overall employee safety and productivity.**

Contraindications

Contraindications are specific medical reasons for not performing a certain action, such as using a specific medication, performing a certain operation, etc. Factors that may contribute to the tendency to develop heat-related illnesses are considered **relative contraindications** to heat stress exposure. **Absolute contraindications** are factors that are definitely known to contribute to heat-related illnesses.

Relative contraindications to hot environments need to be assessed on a case-by-case basis, based on severity and lability of the worker's condition. For example, a severely hypertensive worker is more at risk than a moderately hypertensive worker. The person with severe hypertension is more likely to be overcome by heat stress sooner than one with moderate hypertension.

Relative Contraindications to Heat Stress Exposure

- The presence of chronic illness
 - Renal (kidney) disease
 - Thyroid disease
 - Diabetes or endocrine disorders
 - Heart disease or arrhythmias
 - Hypertension (see Table 1 – Blood Pressure Categories)
 - Dehydration
 - Obesity
 - A history of previously documented heat-related illness
- The use of certain medications:
 - Beta-blockers (typically used to treat blood pressure)
 - Phenothiazines (typically used to treat psychotic disorders, but sometimes for nausea, vomiting, and hiccups)
 - Diuretics (water pills)(typically used to treat high blood pressure)



Absolute contraindications should be adhered to in workplaces. Workers with these risk factors or conditions should not be exposed to hot environments. If these risk factors are not identified, poor or fatal health outcomes may not be avoidable.

Absolute Contraindications to Heat Stress Exposure

- Pregnancy
- Congestive heart failure
- Unstable angina or arrhythmias
- Severe hypertension (see **Table 1 – Blood Pressure Categories**)
- Renal (kidney) failure
- End-stage pulmonary disease
- >100.4°F core body temperature (pre-exposure)
- Infertility

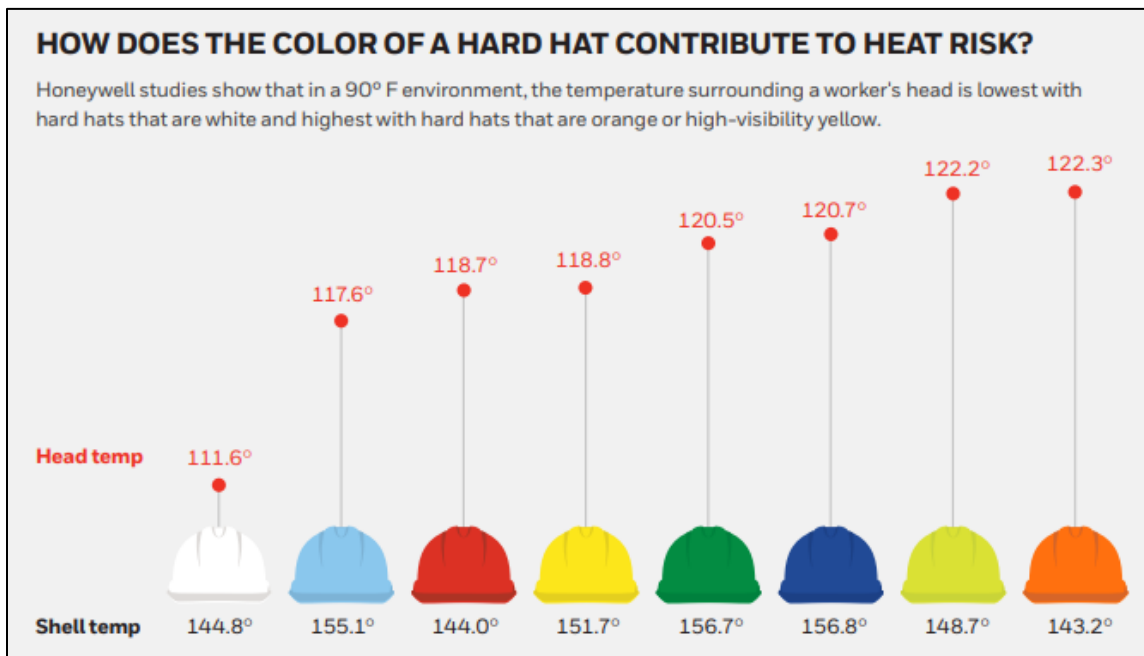
Table 1 – Blood Pressure Categories

| BLOOD PRESSURE CATEGORY | SYSTOLIC mm Hg (upper number) | | DIASTOLIC mm Hg (lower number) |
|--|-------------------------------|---------------|--------------------------------|
| NORMAL | LESS THAN 120 | and | LESS THAN 80 |
| ELEVATED | 120 – 129 | and | LESS THAN 80 |
| HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1 | 130 – 139 | or | 80 – 89 |
| HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2 | 140 OR HIGHER | or | 90 OR HIGHER |
| HYPERTENSIVE CRISIS (consult your doctor immediately) | HIGHER THAN 180 | and/or | HIGHER THAN 120 |

Worker Monitoring Program

Human factors, such as an excessively rapid pulse (>90 beats per minute) with slow recovery time after exercise (more than 3 minutes) and/or an elevated baseline core temperature (>100.4°F), indicate a need for a rest period to allow for recovery to baseline before re-entry into the hot work area. Baseline measurements and exercise recovery time can serve as indicators whether or not a worker is fit to enter a hot environment at the beginning of the workday. Recommended alert limits and recommended exposure limit guidelines are encouraged by OSHA. When workers are exposed to heat stress, biological monitoring with the 3-minute pulse test recovery is recommended during the hottest time of the day or the hottest workplace location.

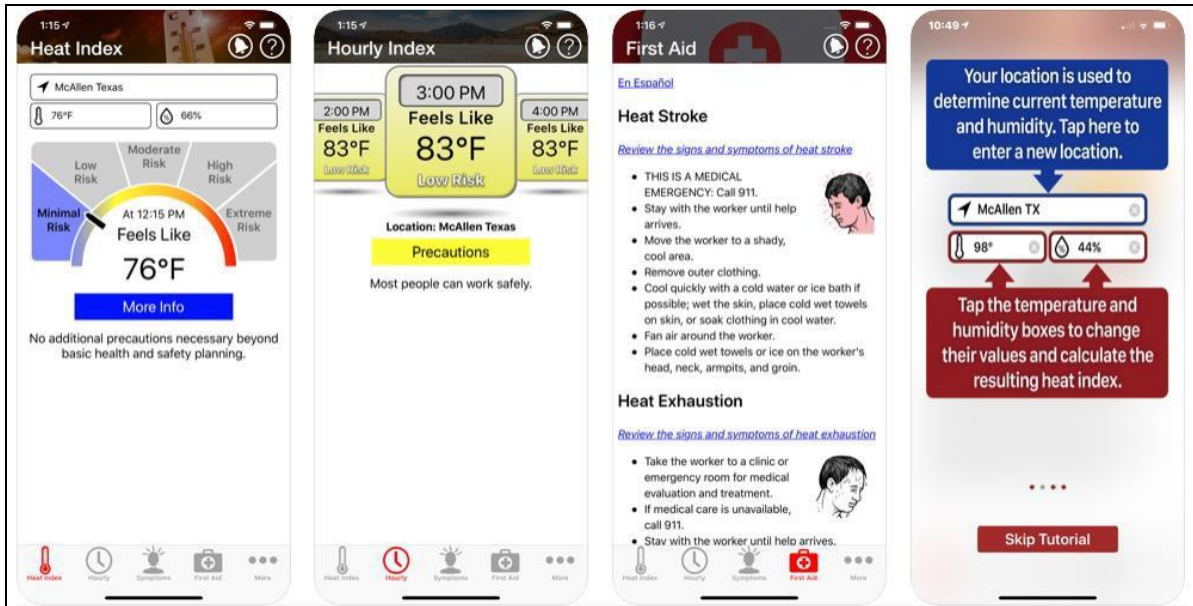
Wearing a hard hat outside? Consider the color of your hard hat when determining the proper protective measures. A recent study by Honeywell shows that a worker’s head temperature can vary by as much as 11°F and the hard hat’s shell temperature can vary by as much as 13°F from one color hard hat to the next!



OSHA-NIOSH Heat Safety Tool

The mobile app allows workers and supervisors to calculate the **heat index** for their worksite, and, based on the heat index, displays a **risk level** to outdoor workers. Then, with a simple "click," you can get reminders about the **protective measures** that should be taken at that risk level to protect workers from heat-related illness- reminders about drinking enough fluids, scheduling rest breaks, planning for and knowing what to do in an emergency, adjusting work operations, gradually building up the workload for new workers, training on heat illness signs and symptoms, and monitoring each other for signs and symptoms of heat-related illness.

Working in full sunlight can increase heat index values by 15° F. Keep this in mind and plan additional precautions for working in these conditions. The OSHA-NIOSH Heat Tool is available in English and Spanish for both Android and iPhone devices. To access the Spanish version, set the phone's language to Spanish.

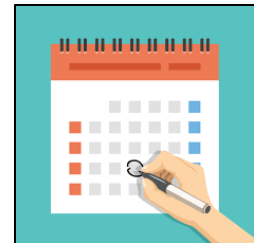


Summary

If you have any questions and/or concerns about your overall risk of heat stress, consult your company's EHS Dept. and/or your primary care physician (PCP).

Upcoming OSHA, DOT, and EPA Compliance Deadlines

- Air Emissions Inventory (Class I & II) – April 1st
- DOT Registrations – June 30th
- EPCRA SARA Form R Toxic Release Inventory (313) – July 1st



If you have any questions about how Arrow Safety can help your employees stay safe and keep your business headed in the right direction, contact us and we'll be glad to help! We travel nationwide and all new customers get **10% off!**

