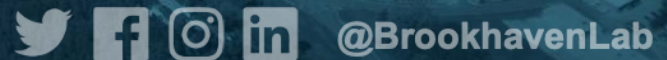




TAKE FIVE for Safety- Preventing Heat Stress

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Background

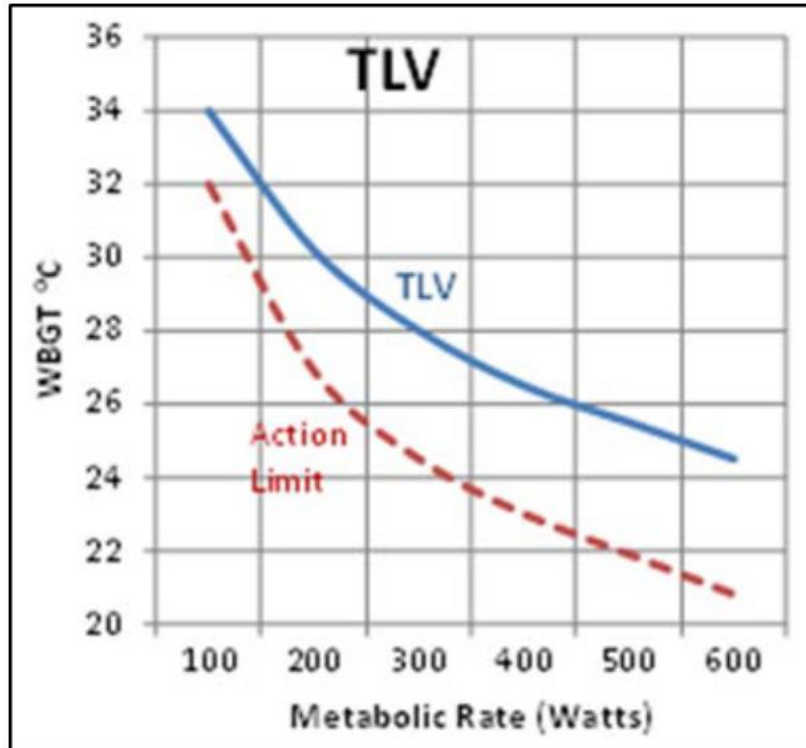
Source (OSHA.gov)

- Millions of U.S. workers are exposed to heat in their workplaces. Although illness from exposure to heat is preventable, every year, thousands become sick from occupational heat exposure, and some cases are fatal.
- Occupational risk factors for heat illness include heavy physical activity, warm or hot environmental conditions, lack of acclimatization, and wearing clothing that holds in body heat.
- Some workers are more susceptible to heat-related illness. Personal risk factors include medical conditions, lack of physical fitness, previous episodes of heat-related illness, alcohol consumption, drugs, and use of certain medication.
- Management should commit to preventing heat-related illness for all employees regardless of their heat tolerance levels.
- Measurement of heart rate, body weight, or body temperature (physiologic monitoring) can provide individualized data to aid decisions about heat controls.
- Most outdoor fatalities, 50% to 70%, occur in the first few days of working in warm or hot environments because the body needs to build a tolerance to the heat gradually over time. The process of building tolerance is called heat acclimatization. Lack of acclimatization represents a major risk factor for fatal outcomes.

Figure 1. Heat-related illness risk factors (NIOSH 2016)



The goal of the ACGIH Threshold Limit Value (TLV) is to limit heat stress exposures to those that can be sustained for hours.



- The TLV is “based on the ability of most healthy, hydrated, and acclimated workers to sustain thermal equilibrium”.
- The TLV is based on Activity/Metabolism rate, Wet Bulb Globe Temperature, and clothing.

The BNL heat stress page has real-time WBGT measurements

The screenshot shows the BNL Heat Stress Conditions webpage. The header includes the Brookhaven National Laboratory logo, the Safety and Health Services Division name, and the U.S. Department of Energy logo. A navigation bar contains links to Home, Industrial Hygiene, Safety Engineering, Safety & Health Representatives, CMS, Program Areas, SOPs, and Contact. A search bar is also present.

BNL Heat Stress Conditions

Refresh the page to access data for the current date and time.

Heat Stress Advisory

When Heat Stress conditions exist, the appropriate Work-Rest regimen appears in red. All temperatures are 30-60 minute averages and are stated in degrees Celsius/Fahrenheit. This information is updated daily from 8:30AM to 5:00PM when potentials for heat stress conditions exist.

Additional Info
Send inquiries to [Nicole Bernholz](#)
[Safety and Health Program Areas](#)
[Join the Heat Stress Notification System](#)

WBGT INDEX (OUTDOOR)	DATE AND TIME	TIME OF LAST UPDATE
30.0 °C / 86.0 °F	06/24/2025 11:45 AM	06/24/2025 11:00 AM

Hourly Work-Rest regimen based on the current WBGT Index and the Work Load Level

Light Work	Moderate Work	Heavy Work	Very Heavy
Normal Work Conditions	50% Work - 50% Rest	25% Work - 75% Rest	Eval*

Do not ignore anyone's signs or symptoms of heat related disorders. Stay hydrated.
*Use physiological monitoring.

WBGT Index (Outdoor) = $0.7\text{Wet Bulb} + 0.2\text{Globe} + 0.1\text{Dry Bulb}$

Wet Bulb Temp	Globe Temp	Dry Bulb Temp
26.8 °C / 80.2 °F	45.0 °C / 113.0 °F	34.1 °C / 93.4 °F

Windows taskbar at the bottom shows the time as 11:46 AM on 6/24/2025, with a weather forecast of 93°F Sunny.

Work Activity Categorization

The following table, which shows the ratings of tasks, can be used to understand the threshold for heat stress alerts. The Environment, Safety, and Health Representatives (ESHRs) will assist in these evaluations. This table is used in conjunction with the Heat Stress Notification System messages and Industrial Hygiene Heat Stress Standard Operating Procedures.

ACGIH Heat Stress Metabolic Rate Category & Activity	Task Rate	Task Watts
REST (0- 115 W)	Rest	115
Sitting	Rest	115
Sitting quietly	Rest	115
Sitting with moderate arm movement	Rest	115
LIGHT (116-180 W)	Light	180
Sitting with light work with hands and arms	Light	115
Sitting with light work with arms and legs	Light	115
Driving	Light	115
Standing with some light arm work and occasional walking	Light	115
Standing with light or moderate work at machine	Light	115
Standing with light work at bench while using mostly arms	Light	115
Standing with light or moderate work at bench	Light	115
Sedentary activity (office, dwelling, laboratory)	Light	126
Book binding	Light	153
Using a table saw	Light	115
Some walking about	Light	115
Walking on level ground 2km/hr. (1.24 mph)	Light	198
MODERATE (181-300 W)	Moderate	300
Sustained moderate hand and arm work	Moderate	300
Moderate arm and leg work	Moderate	300
Moderate arm and trunk work	Moderate	300
Scrubbing in standing position	Moderate	300
Moderate workload task for 60-minute/hr.	Moderate	348.9
Standing, medium activity (shop assistant, domestic work)	Moderate	225
Building industry- brick laying block 15.3 kg (34 lbs.)	Moderate	225
Washing dishes- standing	Moderate	261
Raking leaves	Moderate	306
Washing clothes by hand and ironing	Moderate	306
Iron and steel- ramming the mold with a pneumatic hammer	Moderate	315
Building a concrete mold	Moderate	324
Cutting across the grain with one-man power saw	Moderate	369
Walking about with moderate lifting or pushing	Moderate	300
Walking on level at 6 Km/hr. (3.7 mph) while carrying 3 Kg weight load	Moderate	300
Walking on the level 5 km/h (3 mph)	Moderate	360

<https://intranet.bnl.gov/esh/guides/heatstresses/acgih%20heat%20stresses%20metabolic%20rate%20category%20activity-2021-1130.pdf>

Adjustment Factors related to clothing

Table 1:
Clothing-Adjustment Factors for some Clothing Ensembles*

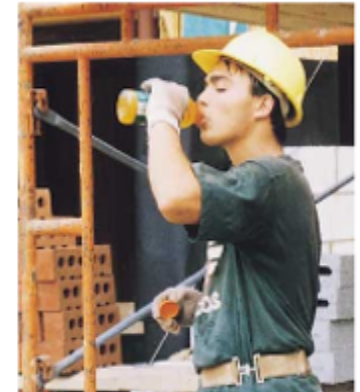
Clothing Type	Addition to WBGT [°C]
Work Clothes (long sleeve shirt and pants)	0
Cloth (woven material) coveralls	0
Double-layer woven clothing	3
SMS polypropylene coveralls	0.5
Polyolefin coveralls	1
Limit-use vapor-barrier-coveralls	11

*These values must not be used for completely encapsulating suits, often called Level A. Clothing Adjustment Factors cannot be added for multiple layers. The coveralls assume that only modesty clothing is worn underneath, not a second layer of clothing.

Prevention and Protection

Precautions for Preventing Heat Illnesses:

- **Shade:** Shield work area or break area from direct sunlight
- **Air Movement:** Fans, unobstructed breezes, A/C
- **Clothing:** Short sleeve shirt made of cotton
- **Personal Protective Equipment:** Ice vests, wet headbands, Vortex suits
- **Fluid Intake**
 - Cool water every 20 minutes
 - Salt in food
 - Electrolyte (Gatorade® type) drinks



III. HEALTH HAZARD INFORMATION RECOMMENDATION

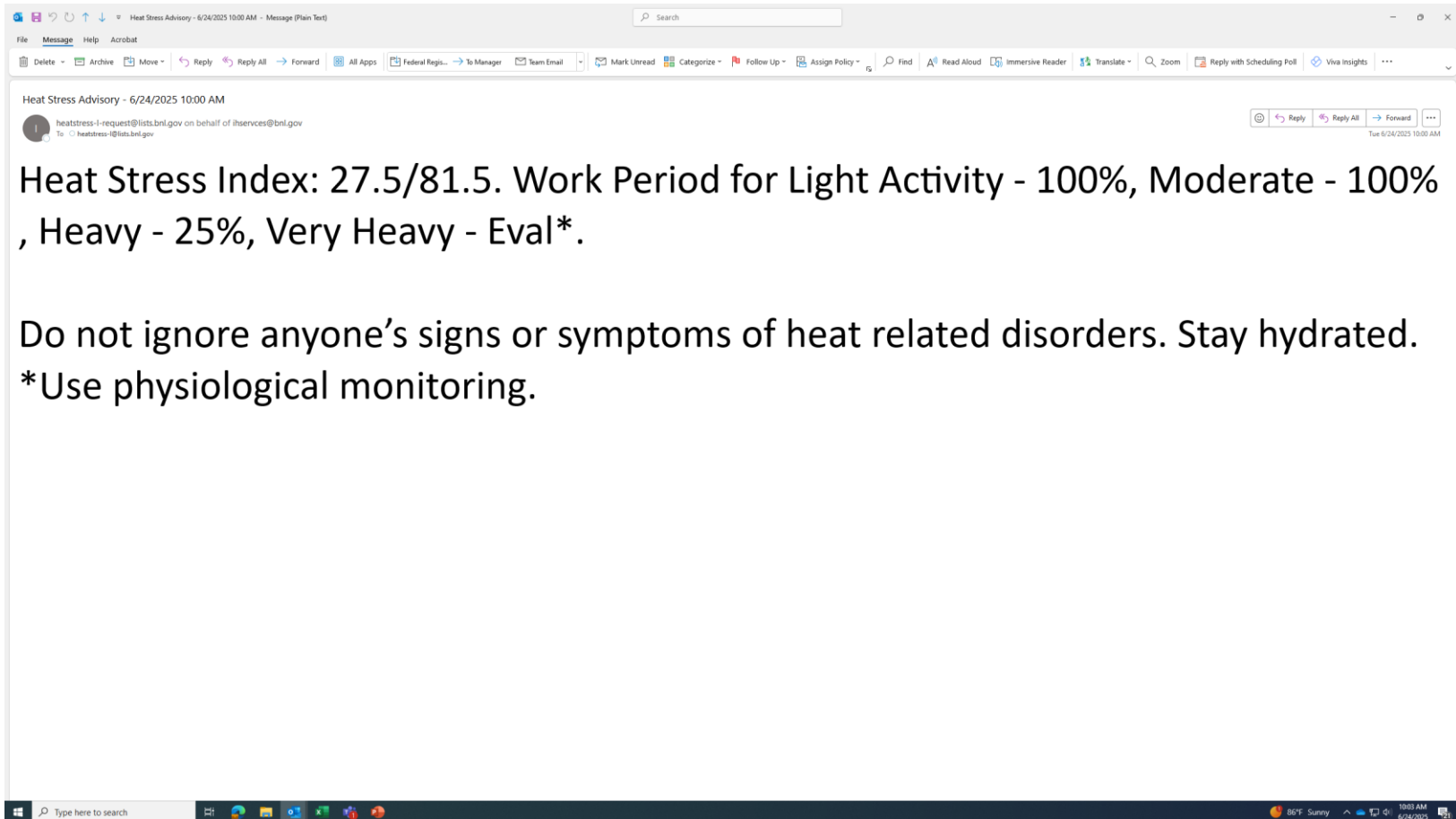
Personal Factor that increase the risk of heat stress are

Age	People become more susceptible to heat stress, as they get older.
Weight	Excessive weight insulates the body core and increases risk.
Fitness	Fit people are at less risk.
Un-acclimatized	Acclimatization is a series of physical adaptations the body make as is gets "use to heat" and allows a worker to be less prone to heat disorders and able to do more work in heat.

Know the Symptoms

- Know the symptoms of your body overheating and know when to seek medical care.
- Symptoms can include:
 - Muscle cramping
 - Unusually heavy sweating
 - Shortness of breath
 - Dizziness
 - Headaches
 - Weakness

BNL Provides Text and Email Updates for Supervisors and Workers



SBMS: Thermal (Heat and Cold) Stress

Step 1	Supervisors/sponsors identify workers who work in high temperature environments (>81°F [27.2°C]) in the work planning and control process, and have them complete Heat Stress Prevention (TQ-HEATSTRESS) training (see the Training and Qualifications website).
Step 2	Supervisors notify the Occupational Medicine Clinic (OMC) of staff who will work in high and/or low temperatures by using the Job Assessment Form .
Step 3	<p>Work planners, supervisors, workers, and staff with concerns regarding hazards from heat/cold conditions can:</p> <ul style="list-style-type: none"> •Request an occupational workplace evaluation by contacting an Environment, Safety & Health Representative (ESHR) •Contact the OMC to discuss medical concerns. <p>When it has been determined by OMC that there is unacceptable risk to worker(s), supervisors revise job assignments and implement controls (e.g., administrative controls, engineering controls, or personal protective equipment [PPE]) to eliminate the hazard. (Go to the ESH Guide: Heat Stress and refer to the Guidance on the Controls and PPE for Heat Stress.)</p>
Step 4	<p>For Hot Environments (e.g., >81°F [27.2°C]): Work planners, supervisors, and workers take measures to evaluate and prevent heat stress during work:</p> <ul style="list-style-type: none"> •Follow the BNL site-wide Heat Stress Notification System and the work/rest regimen (see the exhibit Heat Stress Monitoring) (applicable for outdoor work in short sleeve shirt and long pants only); refer to IH101510 BNL Heat Stress Notification System: Use and Interpretation, SHSD Standard Operating Procedures, Safety and Health Services Division website. •Use a local heat stress monitoring system and the work/rest regimen (see the exhibit Heat Stress Monitoring) (applicable for indoor work or areas not represented by the site monitoring system); •Required use of personal dosimetry, alarms, or physiological monitoring <ul style="list-style-type: none"> • Outdoor work when site notification screening criteria are exceeded or when workers wear vapor barrier clothing (such as coated polyolefin coveralls). • Indoor work when local monitoring criteria is exceeded or when workers are wearing vapor barrier clothing. See the exhibit Heat Stress Monitoring, Section B. •Examples of administrative control include breaks in cool areas, drinking water every 20 minutes, using engineering controls such as fans, and protective equipment such as cooling vests (go to the ESH Guide: Heat Stress and refer to the Guidance on the Controls and PPE for Heat Stress). •Use of cooling PPE (for examples, see the Personal Protective Equipment Showroom/Demonstration Room page). <p>Contact an ESHR for assistance on dosimetry or local monitoring devices.</p>