



University of Arizona
Heat Illness Prevention Program
Environmental Health & Safety (EHS)
Program Administrator: Director, EHS

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CONTENTS

1. PURPOSE.....	3
2. SCOPE.....	3
3. DEFINITIONS.....	5
4. ROLES & RESPONSIBILITIES	8
5. HEAT HAZARD IDENTIFICATION AND ASSESSMENT.....	11
6. HEAT ILLNESS PREVENTION PLANNING	14
7. HEAT ILLNESS CONTROLS AND MONITORING	17
8. TRAINING	23
9. DOCUMENTATION AND RECORDKEEPING	27
10. REFERENCES	29
11. APPENDICES	30
11.1. HEAT ACTION TRIGGER FRAMEWORK & REQUIREMENTS.....	31
11.2. ACCLIMATIZATION PROCEDURES	41
11.3. HYDRATION AND REST BREAK REQUIREMENTS	45
11.4. HEAT ILLNESS RECOGNITION AND EMERGENCY RESPONSE	54
11.5. INDOOR HEAT ILLNESS PREVENTION	66
11.6. VENDOR/CONTRACTOR REQUIREMENTS	71



1. PURPOSE

This Heat Illness Prevention Program establishes comprehensive requirements for protecting workers, students, contractors, and visitors from heat-related illnesses at the University of Arizona. This program is authorized and supported by the University of Arizona administration and is administered by the Environmental Health & Safety (EHS) Unit. All University units must comply with this program and may develop supplemental unit-specific procedures that meet or exceed these requirements and have been approved by EHS.

This program has been created with the intent to:

- Prevent heat-related illnesses, injuries, and fatalities among university personnel
- Establish clear procedures for identifying and controlling heat hazards
- Define trigger temperatures and corresponding protective actions
- Implement acclimatization procedures for new and returning workers
- Ensure adequate hydration, rest breaks, and cool-down areas
- Provide comprehensive training on heat illness recognition and prevention
- Establish emergency response procedures for heat-related incidents
- Ensure compliance with applicable federal, state, and local regulations
- Create a culture of heat safety awareness across campus

This program is based on:

- Proposed OSHA Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings Standard (Published August 30, 2024, not yet adopted)
- OSHA General Duty Clause (Section 5(a)(1) of the OSH Act)
- NIOSH Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments
- California Cal/OSHA Heat Illness Prevention Standards (Sections 3395 & 3396)
- City of Tucson Heat Protection Ordinance for City Contractors
- Pima County Heat Ordinance 2024-010
- Arizona HB2684 (Heat Safety Legislation)
- ISO 45001 Occupational Health and Safety Management Systems
- Best practices from leading research universities including UC Berkeley, Stanford, UC Davis, and other R1 institutions

2. SCOPE

This program applies to:

- All University of Arizona employees (faculty, staff, and student employees)
- Students participating in outdoor activities, athletics, field research, or work-study programs
- Contractors, subcontractors, and vendors performing work on university property
- Volunteers working in university-sponsored activities



- All University-owned, leased, operated, or controlled facilities and outdoor work areas
- Both outdoor and indoor work environments where heat hazards exist

This program particularly applies to, but is not limited to, personnel engaged in:

- Grounds maintenance and landscaping
- Construction, renovation, and building maintenance
- Athletics (practice, competition, training)
- Outdoor field research and archeological work
- Campus events, setup, and operations
- Custodial and facilities operations
- Parking and transportation services
- Food service operations (kitchens, loading docks)
- Laboratory work with heat-generating equipment
- Mechanical and boiler room operations
- Loading and unloading operations
- Warehouse operations in non-climate-controlled spaces

2.1. Covered Populations

This program applies to all individuals who may be exposed to heat illness hazards in University-controlled workplaces, including but not limited to:

- Faculty
 - Postdoctoral associates
 - Graduate assistants
 - Instructional staff
- Staff:
 - Student employees
 - Temporary employees
 - Visiting researchers
 - Facilities and maintenance personnel
- Contractors and vendors operating within University-controlled areas

Students in instructional settings may be covered when hazard exposure may occur as part of laboratory, studio, shop, or instructional activities. Instructional units may provide hazard awareness training relevant to the course materials as approved by EHS.

2.2. Covered Locations

This program, with potential additional compliance programs, applies to all University of Arizona operations where there may be potential heat-related illnesses, including but not limited to:

- Research facilities
- Instructional laboratories



- Art studios and maker spaces
- Theater scene shops
- Maintenance shops
- Facilities mechanical spaces
- Custodial operations
- Grounds operations
- Chemical storage rooms
- Athletics (practice, competition, training)
- Campus events, setup, and operations
- Field research sites under University control
- Parking and transportation services
- Food service operations (kitchens, loading docks)
- Mechanical and boiler room operations
- Loading and unloading operations
- Warehouse operations in non-climate-controlled spaces

This program may not apply to:

- Work performed in fully climate-controlled environments (offices, classrooms, laboratories) that maintain temperatures below 82°F at all times
- Telework locations not under University control
- Emergency operations directly involved with the protection of life or property (fire suppression, emergency medical response, urgent utility repairs)
- Incidental outdoor exposure of less than 15 minutes in any 60-minute period when temperatures are between 80°F and 95°F
- Brief transitions between climate-controlled buildings

3. DEFINITIONS

Acclimatization: The temporary, gradual physiological adaptation of the body to work in heat that occurs when a person is exposed to it over time. Acclimatization peaks in most people within 4 to 14 days of regular work for at least 2 hours per day in the heat. Acclimatization can be lost within days to weeks if heat exposure is discontinued.

- New employees are at highest risk during their first 1-4 days of heat exposure
- Returning employees after time away (vacation, illness) need re-acclimatization
- Acclimatization must be gradual - sudden full exposure is dangerous
- Close supervision required during acclimatization period

Administrative Controls: Work practice controls and procedures designed to reduce heat exposure including: work scheduling (performing work during cooler times), work/rest schedules, rotation of workers, reducing work pace or intensity, reducing work hours, providing relief workers, and increasing frequency of breaks.

Cool-Down Area: An area that is:

- Shielded from direct sunlight and other high radiant heat sources



- Either open to air or provided with ventilation or cooling
- Maintained at or below 82°F where feasible
- Large enough to accommodate workers on break without crowding
- Free of conditions that would defeat cooling purposes
- Readily accessible to workers
- Examples include: shaded areas, tents with fans, air-conditioned trailers, climate-controlled indoor spaces, misting stations combined with shade.

Engineering Controls: Physical modifications to the work environment that remove or reduce heat hazards including but not limited to air conditioning, cooling fans, evaporative coolers, local exhaust ventilation, insulation of hot surfaces and equipment, reflective barriers, misting systems, increased air movement, and process isolation.

Environmental Risk Factors: Conditions that create or increase the risk of heat illness including but not limited to:

- Air temperature
- Humidity levels
- Air movement (or lack thereof)
- Radiant heat from sun, equipment, or processes
- Conductive heat from surfaces (asphalt, roofs, metal)
- Work intensity and duration
- Protective clothing that retains heat

Heat Illness: A serious medical condition resulting from the body's inability to cope with heat load. Types include (from least to most severe):

- Heat rash (prickly heat)
- Heat cramps
- Heat syncope (fainting)
- Heat exhaustion
- Heat stroke (medical emergency - can be fatal)

Heat Index: A measure that combines air temperature and relative humidity to determine the apparent temperature - what the temperature "feels like" to the human body. The heat index is the primary metric used to determine when heat illness prevention measures must be implemented.

Critical Heat Index Values:

- **80°F (Initial Heat Trigger):** Basic heat illness prevention measures required
- **90°F (High Heat Trigger):** Enhanced protective measures required

Heat Stress: The total heat burden placed on the body from both external environmental factors and internal metabolic heat generated by physical work. Heat stress precedes heat illness.



Heat Wave: Any day in which the predicted high temperature will be at least 80°F AND at least 10°F higher than the average high daily temperature for the preceding 5 days. Heat waves require enhanced monitoring and controls.

High Radiant Heat Area: A work area where radiant heat from the sun, hot surfaces, equipment, or processes significantly adds to heat stress. Includes roofing, paving operations, areas near furnaces or ovens, and locations with significant heat reflection.

Initial Heat Trigger: The temperature or heat index of **80°F** at which basic heat illness prevention requirements must be implemented. This threshold aligns with the proposed OSHA standard and Cal/OSHA regulations.

High Heat Trigger: The temperature or heat index of **90°F** at which enhanced heat illness prevention requirements must be implemented, including mandatory breaks, increased monitoring, and additional controls.

Personal Risk Factors

Individual characteristics that may increase susceptibility to heat illness:

- Lack of acclimatization
- Age (very young or elderly)
- Pre-existing medical conditions (heart disease, diabetes, obesity, hypertension)
- Medications that affect heat regulation or hydration
- Previous history of heat illness
- Current illness (fever, gastrointestinal illness)
- Alcohol consumption (previous 24 hours)
- Caffeine consumption
- Poor physical fitness
- Inadequate sleep or rest
- Dehydration

Wet Bulb Globe Temperature (WBGT): A composite temperature measurement that accounts for temperature, humidity, wind speed, sun angle, and cloud cover. WBGT is more comprehensive than heat index but requires specialized equipment. Some units may choose to use WBGT instead of or in addition to heat index.

- Wet bulb temperature (humidity effects)
- Dry bulb temperature (ambient air temperature)
- Globe temperature (radiant heat)

Work/Rest Schedule: A pre-planned schedule alternating work periods with rest periods designed to allow the body to cool down and prevent heat accumulation. The schedule varies based on temperature, work intensity, and worker acclimatization.

Work area: A room or defined space in a workplace where heat illness hazards may be and where workers are present.

Unit: Any University college, school, unit, program, or other operating unit.



Unit Leader(s): Any person of authority and responsibility, from supervisor to senior university leader, within a Unit.

Workers: Refers to all employees, non-employees, or administrators that are or may be exposed to heat illness hazards.

Employees: All University employees, including faculty, staff, graduate assistants/associates, and student workers, whether their employment is full-time, part-time, permanent, or temporary.

Non-Employee: All University students, affiliates, associates, volunteers, and interns who are granted status (enrollee, DCC, etc.) by the University, who are participating in a university-sanctioned program to benefit educationally and/or professionally.

Administrative/Other: Any UA affiliated person who does not fit within the Employee or Non-Employee category, such as a vendor providing services.

4. ROLES & RESPONSIBILITIES

Environmental Health & Safety (EHS)

- Overall administration of the Heat Illness Prevention Program
- Developing and maintaining written program procedures and forms
- Providing training materials and providing or supporting training delivery
- Maintaining a general list of high-risk work activities and locations
- Monitoring compliance through inspections and audits
- Investigating heat-related incidents and near-misses
- Providing technical assistance and consultation to units
- Supporting or issuing heat advisories and alerts to campus community
- Providing consultation and evaluations new work processes for heat hazards as requested
- Reviewing and approving any unit-specific heat illness prevention plans
- Conducting annual program review and updates
- Ensuring compliance with applicable regulations and best practices
- Coordinating with Occupational Health for medical surveillance as needed
- Serving as liaison with ADOSH and other regulatory agencies

Unit Leadership

- Ensuring unit-level compliance with this program
- Designating competent supervisors with heat safety responsibilities
- Ensuring adequate staffing to allow for work/rest schedules
- Supporting any worker, including supervisors, who stop work due to heat concerns



- Participating in the creation and adoption of unit-specific heat illness prevention plans
- Ensuring budget allocation for heat safety equipment and training
- Reviewing incident reports and implementing corrective actions
- Participating in annual program review

Supervisors

Direct supervisors have day-to-day responsibility for heat illness prevention and must:

- Planning and Preparation:
 - Review and follow unit-specific heat illness prevent plan
 - Check daily weather forecasts before work begins
 - Develop work plans that account for heat conditions
 - Schedule work during cooler times when possible
 - Ensure availability of water, shade/cooling areas, and supplies
 - Identify workers who may need acclimatization or heat-related accommodations
 - Communicate heat safety expectations and plan requirements in pre-shift meetings
- During Work Operations:
 - Monitor temperature/heat index throughout the day
 - Implement required controls when heat triggers are reached
 - Observe workers for signs of heat illness
 - Enforce mandatory rest breaks
 - Encourage water consumption
 - Allow additional breaks when requested
 - Respond immediately to signs of heat illness
 - Respond immediately to stop work notifications from workers
 - Modify work as conditions change
- Training and Communication:
 - Ensure all workers under their supervision have completed required training
 - Conduct pre-shift/tailgate meetings to communicate needs and expectations
 - Brief workers on heat hazards specific to the task and/or work area
 - Encourage workers to report symptoms and/or issue stop work orders without fear of consequences
- Documentation:
 - Complete heat illness prevention plan/checklist for work activities
 - Document training attendance
 - Report heat-related incidents to EHS immediately

Workers

All individuals working in conditions where heat hazards exist are responsible for:

- Personal Responsibility:



- Drinking adequate water and electrolytes throughout the day (at least 1 quart per hour during heat exposure)
 - Taking breaks before and when feeling overheated
 - Recognizing personal risk factors and managing these or informing supervisors
 - Getting adequate sleep and nutrition
 - Avoiding alcohol and limiting caffeine
 - Wearing appropriate clothing for conditions
- Communication:
 - Immediately reporting heat illness symptoms to supervisor that they are experiencing or for co-workers experiencing any
 - Informing supervisors of any personal factors that increase heat illness risk
 - Speaking up if they feel unsafe due to heat and issuing a stop work order if needed
 - Asking questions about heat safety procedures
 - Observing co-workers for signs of heat illness
 - Encouraging co-workers to drink water and take breaks
 - Alerting supervisors to concerns about others
 - Assisting someone experiencing heat illness
- Compliance:
 - Following all heat illness prevention procedures
 - Completing required training
 - Using provided cooling measures and PPE
 - Watching out for co-workers (buddy system)
 - Not working through heat illness symptoms to "tough it out"

Contractors and Vendors

- Providing a written heat illness prevention program meeting or exceeding University requirements
- Providing proof of employee training before work begins
- Implementing their heat illness prevention procedures
- Coordinating with University supervisors on heat safety measures
- Providing their own water, cooling resources, and equipment unless otherwise agreed
- Reporting heat-related incidents to University EHS immediately
- Complying with University heat safety policies when working on campus

Medical Providers

Occupational Health

- Providing medical evaluation for workers with heat-related concerns
- Conducting medical surveillance for high-risk workers if needed
- Providing guidance on work restrictions for heat-sensitive individuals



- Assisting with return-to-work evaluations after heat illness
- Providing education on personal risk factors
- Coordinating with EHS on medical aspects of the program

Emergency Response (Local Fire/EMT/Police Department)

- Responding to heat-related medical emergencies
- Providing advanced medical care and transport
- Participating in program planning and drills
- Providing input on emergency procedures
- Training supervisors on emergency recognition and response

Stop-Work and Hazard Abatement Authority

EHS retains the authority to require immediate corrective action where heat hazards present. EHS may require:

- Immediate correction of deficiencies.
- Temporary suspension of operations
- Mandatory retraining
- Supervisor corrective action plans
- Escalation to Unit Leadership

Stop-work authority is exercised procedurally and proportionally and is intended to prevent injury, exposure, regulatory citation, or institutional liability.

Escalation and Accountability Structure

Accountability for safety and compliance follows this escalation structure:
Supervisor → Unit Leadership → Environmental Health & Safety (EHS)

If deficiencies are identified:

- Supervisor is notified and corrective action(s) required.
- If unresolved, corrective action(s) and deadlines are communicated to Unit Leadership.
- If systemic, high-risk, repeated, or unresolved after escalation to Unit Leadership, EHS may intervene directly with authority from their senior leadership

This structured escalation ensures procedural accountability while maintaining institutional oversight.

5. HEAT HAZARD IDENTIFICATION AND ASSESSMENT

5.1. Work Activities and Locations Assessment



EHS, in collaboration with units, shall identify all work activities and locations where employees may be exposed to heat hazards.

Assessment Factors:

- Typical temperatures during work hours
- Duration of exposure
- Physical demands of work (light, moderate, heavy)
- Availability of shade or climate control
- Number of employees potentially affected
- Frequency of work in heat
- Seasonal considerations

High-Risk Activities (non-exhaustive list):

- Groundskeeping and landscaping
- Roofing, paving, and outdoor construction
- Athletics (practice, competitions, training)
- Loading/unloading operations
- Custodial work in non-climate-controlled areas
- Kitchen and food service operations
- Laboratory work with heat-producing equipment
- Mechanical/boiler room work
- Parking enforcement and traffic control
- Event setup and operations
- Field research
- Warehouse operations without air conditioning

5.2. Environmental Monitoring Requirements

Weather Monitoring: Supervisors of outdoor work must monitor weather conditions daily during “hot” season (approximately May 1 through October 15 in Tucson, may need to be adjusted by specific location).

Sources for Temperature/Heat Index Information:

- [National Weather Service forecast](#)
- OSHA-NIOSH Heat Safety Tool smartphone app
- On-site weather stations (if available)
- [Heat index charts](#)

Monitoring Procedure:

1. Check forecast before shift begins
2. Note predicted high temperature and current heat index
3. Re-check conditions periodically if working extended hours
4. Monitor for heat advisories or excessive heat warnings
5. Adjust work plans based on conditions



Indoor Monitoring:

For indoor work areas without effective climate control, temperature must be monitored when:

- Complaints of excessive heat are received
- Heat-producing equipment is in use
- Outside temperatures exceed 90°F
- Work involves moderate to heavy physical activity

Use calibrated thermometers to measure temperature at locations where employees work.

5.3. Job Hazard Analysis for Heat

Supervisors should conduct a job hazard analysis, and is encouraged to contact EHS for support or more detailed assessments, considering:

Physical Demands:

- Light work: Office work, sitting, light assembly
- Moderate work: Walking, standing, moderate lifting
- Heavy work: Digging, carrying heavy loads, intense physical labor

Duration (task or work area):

- Intermittent (< 1 hour)
- Extended (1-4 hours)
- Prolonged (> 4 hours)

Personal Protective Equipment:

- Does PPE prevent evaporative cooling?
 - Tyvek or polypropylene coveralls, heavy cloth or materials (electrician gear) etc.
- Can PPE be modified for heat conditions without creating additional hazards?
- Can additional PPE be utilized to increase evaporative cooling without creating additional hazards?

Environmental Factors:

- Direct sun exposure vs. shade
- Reflective surfaces (pavement, buildings)
- Heat-producing equipment nearby
- Ventilation/air movement
- Humidity levels

Worker Personal Factors:

- New workers or returning after time off
- Medical conditions or medications
- Previous heat illness



- Physical conditioning
- Age

5.4. Heat Illness Risk Matrix

EHS provides a risk assessment matrix to help supervisors evaluate heat risk:

Low Risk:

- Temperature/heat index < 80°F
- Light work
- Good hydration practices
- Shade available
- Acclimatized workers

Moderate Risk:

- Temperature/heat index 80-89°F
- Moderate work intensity
- Some shade available
- Partially acclimatized workers
- Standard precautions adequate

High Risk:

- Temperature/heat index 90-99°F
- Moderate to heavy work
- Limited shade
- New or non-acclimatized workers
- Enhanced precautions required

Very High/Extreme Risk:

- Temperature/heat index $\geq 100^\circ\text{F}$
- Heavy physical work
- No shade or indoor cooling
- Non-acclimatized workers
- Protective clothing required
- Maximum precautions required; consider stopping work

6. HEAT ILLNESS PREVENTION PLANNING

6.1. Heat Season Preparation

Annual Preparation (Before May 1):

- Review and update heat illness prevention procedures
- Inspect and inventory heat safety equipment
- Ensure adequate supplies (water coolers, ice, canopies, cooling towels, first aid supplies)
- Test cooling equipment (fans, misters, A/C in vehicles/trailers)



- Verify training is current for all affected workers
- Schedule refresher training sessions
- Distribute heat safety information to unit
- Review previous year's incidents and near-misses
- Update contact lists for emergency response

Unit-Level Preparation:

- Develop or update unit-specific heat illness prevention plans
- Identify high-risk work activities
- Designate heat safety coordinators
- Establish communication procedures
- Pre-position heat safety supplies at work locations
- Schedule work to avoid peak heat when possible
- Plan for adequate staffing to allow breaks
- Brief all employees on heat safety expectations

6.2. Heat Illness Prevention Plan

Each unit with workers exposed to heat illness conditions should develop a written Heat Illness Prevention Plan that addresses:

1. Scope and Applicability

- Which employees/activities are covered
- Specific worksites and locations
- Timeframe (seasonal or year-round)

2. Responsibilities

- Who is the heat safety coordinator
- Supervisor responsibilities
- Employee responsibilities
- Emergency contacts

3. Heat Monitoring

- How temperature/heat index will be monitored
- Frequency of monitoring
- Who is responsible for monitoring
- Trigger temperatures for action

4. Hydration

- Water sources and locations
- Quantity available
- How water will be maintained (clean, cool)
- Who ensures availability

5. Cool-Down Areas

- Location of shade or climate-controlled rest areas



- Capacity of cool-down areas
- How areas will be maintained

6. Work/Rest Schedules

- Break frequency at different temperature levels
- Duration of breaks
- How breaks are tracked and enforced

7. Acclimatization

- Procedures for new workers
- Procedures for workers returning after absence
- Close observation requirements
- Graduated work schedules

8. Training

- Who requires training
- How training is delivered
- Documentation method

9. Emergency Response

- Recognition of heat illness symptoms
- First aid procedures
- How to summon emergency services
- Location information for responders

10. Communication

- How heat advisories will be communicated
- How workers can report concerns
- Daily briefing procedures on hot days

6.3. Resource Allocation

Units and supervisors must ensure availability of:

Water:

- Potable drinking water at all outdoor and hot indoor work locations
- Minimum: 1 quart per employee per hour
- Water must be cool (39-59°F recommended), clean, and fresh
- Individual disposable cups or employee water bottles
- Water containers cleaned regularly

Shade/Cooling:

- Canopies, umbrellas, or shade structures for outdoor work
- Climate-controlled spaces for breaks ($\leq 82^{\circ}\text{F}$)
- Fans or misters for outdoor cooling
- Ice and cooling towels



- Cool vests for high-risk activities (if appropriate)

First Aid:

- First aid supplies at work locations
- Ice packs or cold compresses
- Emergency contact information posted
- Communication devices (cell phones, radios)

Monitoring Equipment:

- Thermometers or heat index monitors
- Weather radio or app access

Educational Materials:

- Heat illness prevention posters (English and Spanish)
- Heat index charts
- Emergency response guides
- Training materials

6.4. Work Scheduling and Engineering Controls

Scheduling Strategies:

- Schedule strenuous work during cooler parts of day (early morning, late afternoon)
- Split shifts to avoid midday heat
- Rotate workers among tasks to vary heat exposure
- Increase staffing on hot days to reduce individual workload
- Postpone non-urgent work during extreme heat

Engineering Controls:

- Install shade structures at frequently used outdoor locations
- Provide misting systems at outdoor break areas
- Install fans in non-climate-controlled indoor spaces
- Use insulation on hot surfaces
- Position reflective barriers to block radiant heat
- Relocate break areas to cooler locations
- Provide air-conditioned vehicles or trailers for breaks
- Improve ventilation in hot indoor spaces

7. HEAT ILLNESS CONTROLS AND MONITORING

7.1. Daily Heat Safety Procedures

Every working day during the “heat” season, supervisors and/or units shall:

1. Check Weather Forecast



- Review predicted high temperature
 - Note current and forecasted heat index
 - Check for heat advisories or warnings
 - Determine if heat wave conditions exist
2. Assess Planned Work
- Review physical demands of work
 - Identify any special hazards (PPE requirements, extra heat sources)
 - Determine acclimatization needs for workers
3. Pre-Position Resources
- Place water at work location (sufficient quantity)
 - Ensure shade/cooling areas are set up and functional
 - Stage first aid supplies and ice
 - Verify communication devices work
4. Conduct Pre-Shift Briefing
- Inform crew of forecasted temperature/heat index
 - Review heat illness symptoms
 - Remind about hydration requirements
 - Explain work/rest schedule for the day
 - Encourage reporting of symptoms
 - Answer questions/concerns
5. Implement Controls Based on Conditions
- If < 80°F: Ensure water available, remind workers of heat safety
 - If 80-89°F: Implement Initial Heat Trigger requirements (Section 10.1)
 - If ≥ 90°F: Implement High Heat Trigger requirements (Section 10.2)

7.2. Heat Trigger Requirements

See Appendices for detailed information on heat trigger requirements

7.3. Acclimatization

See Appendices for detailed information on acclimatization requirements

7.4. Hydration Practices

Water Requirements:

- Provide at minimum 1 quart per worker per hour
- Make water accessible at all times (< 5 minutes away)
- Begin shift with sufficient water; replenish as needed throughout day
- Water should be cool (39-59°F ideal) - use ice, coolers
- Water must be potable, clean, and fresh

Encouraging Hydration:



- Remind workers to drink at least 1 cup (8 oz) every 15-20 minutes
- Don't wait until thirsty
- Schedule water breaks
- Lead by example - supervisors should drink water visibly
- Provide individual water bottles to workers
- Make water appealing (good taste, proper temperature)
- Discourage excessive caffeine or energy drinks

Signs of Adequate Hydration:

- Light-colored urine (pale yellow)
- Frequent urination
- No excessive thirst

Electrolyte Replacement:

- For work lasting > 2 hours in high heat with heavy sweating, consider sports drinks
- Provide salty snacks with water
- Do not rely solely on electrolyte drinks - water is primary

7.5. Cool-Down Breaks

Preventive Cool-Down:

- Workers may take cool-down break ANY TIME they feel need
- Minimum 5-minute break
- Must be in shade or area $\leq 82^{\circ}\text{F}$
- Additional to scheduled rest breaks

During Cool-Down:

- Monitor worker for symptoms
- Ask if experiencing any heat illness symptoms
- Encourage continued drinking
- Worker may not return to work until:
 - Minimum time has elapsed (5 minutes + time to access shade)
 - Any symptoms have resolved
 - Worker states ready to return
- Never pressure worker to return to work early

Cool-Down Area Requirements:

- Block from direct sunlight
- Shield from radiant heat sources
- Open to air or ventilated/cooled
- Large enough for all workers on break
- Seating available
- Water available in shade area
- Safe and free from hazards



7.6. Monitoring for Heat Illness

Supervisors must actively watch conditions and workers, not just be available.

Physical Signs:

- Heavy sweating or absence of sweating (ominous sign)
- Flushed or pale skin
- Rapid pulse
- Rapid breathing
- Stumbling, poor coordination
- Confusion or disorientation
- Nausea or vomiting

Behavioral Signs:

- Irritability or unusual behavior
- Decreased work performance
- Lack of communication or responsiveness
- Withdrawal from group
- Irrational decisions

Verbal Indicators:

- Complaints of headache, dizziness
- Reports of nausea or weakness
- Expressions of extreme fatigue
- Statements about feeling hot or unable to cool down

Response to Observations:

- Immediately move worker to cool area
- Provide water
- Assess condition (use heat illness recognition tool)
- Do not allow worker to continue if any symptoms present
- Call for medical help if symptoms are severe

Worker Observation:

- Supervisors document daily worker monitoring
- Note any symptoms observed or reported
- Record break times
- Document water consumption reminders

Temperature Monitoring:

- Record temperature/heat index at start of shift
- Re-check at least every 2 hours during work
- Document on daily work log or heat illness prevention checklist
- Note when trigger temperatures reached and controls implemented

7.7. Reporting Heat Illnesses



ALL of the following must be reported to EHS immediately:

- Any heat-related illness requiring medical attention
- Any emergency medical services call related to heat
- Any loss of consciousness
- Any hospitalizations due to heat
- Heat-related fatalities (report within 8 hours)
- Near-miss events (worker exhibited symptoms but did not require emergency care)

Immediate Reporting:

- Supervisor calls EHS at (520) 626-6850
- After hours: Contact UAPD (520) 621-8273
- Complete incident report within 24 hours

EHS will investigate to determine:

- What happened and when
- Environmental conditions (temperature, humidity, work demands)
- Acclimatization status of affected worker
- Controls in place at time of incident
- Why controls were inadequate
- Root causes
- Corrective actions needed

Follow-Up:

- Medical clearance required before return to work after heat illness
- Consider work restrictions
- Additional training may be required
- Work practices reviewed and modified as needed

7.8. Program Audits and Inspections

EHS may conduct periodic inspections to verify:

- Water is available and adequate
- Shade or cool-down areas provided
- Workers taking breaks
- Supervisors monitoring workers
- Training has been completed
- Emergency procedures in place

Annual Program Audit (conducted by EHS)

- Incident and near-miss data analysis
- Training completion rates
- Compliance observations
- Unit heat illness prevention plans reviewed
- Equipment inventory and condition



- Effectiveness of controls
- Regulatory compliance
- Recommendations for improvement

7.9. Weather Data Analysis

Data tracked (EHS or Unit):

- Days above 80°F, 90°F, 95°F, 100°F, 105°F
- Heat wave occurrences
- Excessive heat warnings
- Correlation with incident rates
- Forecast accuracy

Use of Data:

- Predict high-risk periods for upcoming year
- Plan resource allocation
- Schedule training
- Issue early warnings to campus

7.10. Medical Surveillance

For workers in extremely high-risk positions, Occupational Health may conduct:

- Pre-placement medical evaluations
- Periodic health monitoring
- Medical clearance after heat illness
- Fitness-for-duty evaluations
- Medication reviews for heat-sensitive drugs

7.11. Equipment Inspection and Maintenance

Schedule:

- Before heat season begins (April)
- Monthly during heat season (May-October)
- After any heat-related incident
- When damage reported

Equipment to Inspect:

- Water coolers (clean, functional)
- Shade structures (stable, adequate coverage)
- Fans and misters (operational)
- First aid supplies (stocked, not expired)
- Communication devices (charged, working)
- Thermometers (accurate, calibrated)

Maintenance:

- Clean water containers weekly
- Replace damaged shade structures



- Repair or replace broken fans
- Restock first aid supplies
- Update communication equipment

8. TRAINING

8.1. Training Authority and Responsibility

EHS provides and supports unit-driven heat illness training programs for the University of Arizona community. Training may be delivered through:

- Direct instruction by EHS personnel
- EHS-approved (via documented train-the-trainer programming) unit-level trainers
- Online training modules created or approved by EHS
- Vendor-provided training, as approved in writing by EHS

8.2. Conditions Requiring Training

8.2.1. Initial Training

- All workers must receive heat illness training prior to assignment of any task or any area exposing them to potential heat illness risks
- Training can be provided by EHS, unit-level trainer, or vendor and must minimally cover requirements specified in Section 8.3
- Supervisors should receive additional training from EHS or their unit leadership upon assignment of supervisory duties, including assessments, incident reporting obligations, and more

8.2.2. Additional Training

- Retraining shall be provided to any previously trained worker when:
 - Changes in the workplace render previous training obsolete,
 - Changes in the types of controls to be used render previous training obsolete,
 - As shown through demonstration (incident, injury, near miss, etc.), potential or known inadequacies are identified in an affected worker's knowledge or use of assigned heat illness prevention controls to indicate that they have not retained the requisite understanding or skill to properly utilize them
- Routine refresher training should be provided to all exposed workers annually and may be required for high risk workers at on a more frequent basis

8.3. Training Content Requirements

All heat illness training shall minimally address the following elements:



1. Environmental Risk Factors

- Temperature and heat index
- Humidity effects on heat stress
- Radiant heat sources (sun, hot surfaces, equipment)
- Lack of air movement
- How these factors combine to create heat stress

2. Personal Risk Factors

- Lack of acclimatization (most important)
- Age and fitness level
- Medical conditions (diabetes, heart disease, obesity, hypertension)
- Medications that affect heat tolerance
- Previous heat illness
- Pregnancy
- Current illness (especially gastrointestinal)
- Alcohol consumption (previous 24 hours)
- Caffeine consumption
- Lack of sleep
- Poor nutrition or skipping meals

3. Importance of Acclimatization

- What acclimatization is and why it matters
- How long it takes (7-14 days)
- Who needs acclimatization
- Symptoms during acclimatization period
- That most heat deaths occur in first few days

4. Hydration Requirements

- How much to drink (at least 1 cup every 15-20 minutes)
- When to drink (before feeling thirsty)
- What to drink (primarily water; electrolytes for prolonged work)
- Signs of good hydration vs. dehydration
- Avoid alcohol and limit caffeine

5. Types of Heat Illness

- Progression from minor to serious
- Heat rash, cramps, syncope, exhaustion, stroke
- Signs and symptoms of each
- Which are medical emergencies

6. Recognition of Symptoms

- How to recognize symptoms in yourself:
 - Headache, dizziness, weakness
 - Nausea, confusion
 - Heavy or absent sweating



- When to report symptoms
- How to recognize symptoms in co-workers:
 - Behavioral changes
 - Physical signs
 - Importance of watching out for each other

7. Importance of Reporting Symptoms

- Report immediately - even if mild
- Don't try to "tough it out"
- No shame in reporting symptoms
- Early recognition prevents serious illness
- Reporting helps co-workers too
- No retaliation for reporting

8. University's Heat Illness Prevention Procedures

- Trigger temperatures (80°F and 90°F)
- Water availability and requirements
- Cool-down areas and rest breaks
- Acclimatization procedures for new/returning workers
- Work/rest schedules
- Emergency procedures

9. Employee Rights and Protections

- Right to water at all times
- Right to rest breaks (preventive and scheduled)
- Right to shade/cool-down areas
- Right to report symptoms without retaliation
- Right to refuse unsafe work
- How to report violations

10. Emergency Response

- How to call for help (911, UAPD)
- How to provide location information
- Basic first aid for heat illness
- Never leave ill person alone
- Don't attempt to "wait it out"

11. Employer Procedures

- Specific procedures for their work location/unit
- Who is their supervisor
- Where water is located
- Where cool-down areas are located
- Communication methods
- Emergency contact information

Supervisors receive all general employee training PLUS additional training on:



1. Supervisor Responsibilities Under This Program
 - Legal obligations under OSHA General Duty Clause
 - University policy requirements
 - Personal accountability for worker safety
 - Authority to stop work if unsafe
 - Documentation requirements
2. Heat Illness Prevention Plan Implementation
 - How to develop unit-specific plan
 - Completing work planning checklists
 - Resource allocation
 - Work scheduling considerations
3. Weather Monitoring
 - How to check weather forecasts
 - Reading heat index charts
 - Using OSHA-NIOSH Heat Safety Tool app
 - Determining when trigger temperatures reached
 - Understanding heat advisories and warnings
4. Implementing Controls
 - When to implement Initial Heat Trigger requirements (80°F)
 - When to implement High Heat Trigger requirements (90°F)
 - How to set up and maintain cool-down areas
 - Ensuring adequate water supply
 - Implementing work/rest schedules
 - Modifying work when necessary
5. Acclimatization Protocols
 - Identifying who needs acclimatization
 - Implementing graduated exposure schedules
 - Close observation requirements
 - Documenting acclimatization progress
 - When to extend or restart acclimatization
6. Worker Observation and Monitoring
 - What to watch for (physical, behavioral signs)
 - Observation methods (direct, buddy system, communication)
 - How to ask workers about symptoms
 - Creating environment where workers feel safe reporting
 - Responding to concerning observations
7. Heat Illness Recognition in Workers
 - Recognizing heat illness at all stages
 - Distinguishing between exhaustion and stroke (critical)



- Understanding behavioral changes as warning signs
 - Taking symptoms seriously even if worker downplays them
8. Emergency Response Procedures
- When to call 911 (don't hesitate)
 - Treatment while waiting for EMS
 - Cooling techniques
 - What information to provide to EMS
 - Ensuring EMS can find location
 - Post-emergency procedures
9. Encouraging Reporting
- Creating culture where reporting is expected
 - Never punishing workers for symptoms or taking breaks
 - Reinforcing that early reporting prevents serious illness
 - Leading by example (supervisor drinks water, takes breaks)
10. Documentation
- Daily temperature monitoring
 - Work/rest schedule tracking
 - Acclimatization logs
 - Incident reporting
 - Training records
 - Permit or checklist completion
11. Dealing with Non-Compliance
- What to do when workers aren't drinking water
 - Addressing workers who refuse breaks
 - Handling workers who downplay symptoms
 - Balancing productivity with safety
 - When to escalate concerns

9. DOCUMENTATION AND RECORDKEEPING

9.1. Required Documentation

The University must maintain comprehensive records to demonstrate program compliance and support continuous improvement.

Program Documents:

- This Heat Illness Prevention Program (current version and revision history)
- Unit-specific heat illness prevention plans
- Procedures and work instructions
- Forms and templates

Training Records:



- Employee training (name, date, topics, trainer)
- Supervisor training
- Certificates of completion
- Sign-in sheets
- Refresher training records

Daily Operational Records:

- Heat Safety Checklist (can be made with EHS support)
- Temperature/heat index monitoring logs
- Work/rest schedule documentation
- Acclimatization tracking forms
- Water and shade provision verification
- Pre-shift meeting documentation

Incident Records:

- Heat illness incident reports
- Near-miss reports
- Investigation reports
- Corrective action plans
- Medical documentation (if applicable)

Audit and Inspection Records:

- Program audit reports
- Field inspection reports
- Equipment inspection logs
- Findings and corrective actions

Contractor Records:

- Contractor heat illness prevention programs
- Contractor training documentation
- Contractor coordination meeting notes
- Contractor incident reports

9.2. Retention Requirements

Record Type	Retention Period
Program documents (current)	Duration of program + 1 year
Program documents (superseded)	3 years after superseded
Employee training records	Duration of employment + 3 years
Daily logs and checklists	1 year minimum, 3 years recommended
Incident reports	Permanent (indefinitely)
Investigation reports	Permanent
Medical records	Per OSHA medical records standard (30 years)



Record Type	Retention Period
Audit reports	5 years
Contractor documentation	Duration of contract + 3 years

10. REFERENCES

10.1. Regulatory References

Federal:

- OSHA General Duty Clause, Section 5(a)(1) of the Occupational Safety and Health Act
- Proposed OSHA Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings Standard (Published August 30, 2024)
- NIOSH Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments (2016)
- NIOSH Occupational Exposure to Heat and Hot Environments, Revised Criteria 2016

State and Local:

- California Code of Regulations, Title 8, Section 3395 - Heat Illness Prevention in Outdoor Places of Employment
- California Code of Regulations, Title 8, Section 3396 - Heat Illness Prevention in Indoor Places of Employment
- Arizona HB2684 - Heat Safety Legislation
- City of Tucson Heat Protection Ordinance for City Contractors
- Pima County Ordinance 2024-010 - Heat Safety Requirements

Consensus Standards:

- ACGIH Threshold Limit Values for Heat Stress and Strain
- ANSI/ASHRAE Standard 55 - Thermal Environmental Conditions for Human Occupancy
- ISO 7243 - Hot Environments - Estimation of Heat Stress on Working Man

Athletic Standards:

- NCAA Inter-Association Task Force Recommendations on Heat Acclimatization and Heat Illness Prevention
- National Athletic Trainers Association Position Statement on Exertional Heat Illnesses

10.2. Technical Resources

Heat Index and Monitoring:

- National Weather Service Heat Index Chart
- OSHA-NIOSH Heat Safety Tool (smartphone app)



- Wet Bulb Globe Temperature (WBGT) measurement guidance
- Occupational heat exposure assessment protocols

Medical Information:

- CDC Heat Stress Resources
- NIOSH Heat Stress Information
- Mayo Clinic Heat Illness Information
- Wilderness Medical Society Practice Guidelines for Heat Illness

Training Materials:

- OSHA Heat Illness Prevention Training Videos
- NIOSH Heat Stress Training Materials
- California Unit of Public Health Heat Illness Prevention Resources
- CDC NIOSH Heat Stress Campaign Materials

11. APPENDICES



11.1. HEAT ACTION TRIGGER FRAMEWORK & REQUIREMENTS

11.1.1. Heat Trigger Framework

The University of Arizona uses a two-tiered trigger system based on temperature or heat index (whichever is greater). This system aligns with the proposed OSHA standard and provides clear thresholds for action.

Trigger Levels:

- Initial Heat Trigger: 80°F - Basic heat illness prevention measures required
- High Heat Trigger: 90°F - Enhanced protective measures required

Additional Considerations:

- Heat wave conditions
- Work intensity (light, moderate, heavy)
- Worker acclimatization status
- Personal risk factors
- Protective clothing requirements

11.1.2. Determining Temperature vs. Heat Index

When to Use Temperature:

- Indoor work environments
- Low humidity conditions (< 40% RH)
- When heat index tables not applicable

When to Use Heat Index:

- Outdoor work environments
- Moderate to high humidity conditions ($\geq 40\%$ RH)
- When both temperature and humidity are significant factors

Rule: Always use the higher value between actual temperature and heat index when determining which trigger level applies.

11.1.3. Heat Index Determination

Tools for Determining Heat Index:

- National Weather Service heat index chart (see Appendix)
- OSHA-NIOSH Heat Safety Tool smartphone app (free download)
- Online heat index calculators
- Weather service forecasts
- On-site weather stations with heat index calculation

Key Points:

- Heat index combines temperature and relative humidity



- Represents "feels like" temperature
- More accurate indicator of heat stress than temperature alone
- Can be significantly higher than actual temperature in humid conditions

Example Heat Index Values:

Temperature	40% Humidity	60% Humidity	80% Humidity
80°F	80°F	82°F	84°F
85°F	85°F	88°F	93°F
90°F	91°F	97°F	106°F
95°F	97°F	107°F	122°F
100°F	104°F	120°F	141°F

11.1.4. Initial Heat Trigger (80°F) - Required Actions

When temperature or heat index reaches **80°F**, implement **ALL** of the following:

1. WATER PROVISION (Mandatory)

- Provide potable drinking water at no cost to workers
- Minimum quantity: 1 quart per employee per hour for entire shift
- Water must be:
 - Fresh, clean, and suitably cool (39-59°F recommended)
 - Located as close as practicable to work areas
 - Readily accessible (within 5-minute walk)
- May start with smaller quantities if effective replenishment procedures in place
- Encourage frequent drinking (at least every 15-20 minutes)

2. COOL-DOWN AREAS (Mandatory)

- Provide access to shade or climate-controlled rest areas
- Areas must be:
 - Shielded from direct sunlight and radiant heat
 - Either open to air or ventilated/cooled
 - Maintained at or below 82°F (indoor areas)
 - Large enough to accommodate workers on break without crowding
 - Located as close as practicable to work areas
- Outdoor shade must block sunlight effectively (objects should not cast shadows in shaded area)
- Workers allowed preventive cool-down breaks when needed (minimum 5 minutes)

3. ACCLIMATIZATION PROCEDURES (Mandatory)

Implement acclimatization protocol (Section 11) for:

- Workers new to heat exposure
- Workers returning after 7+ consecutive days away from heat exposure



- All workers during heat wave conditions

Requirements:

- Close observation during acclimatization period (especially first 14 days)
- Gradual increase in work intensity or duration
- More frequent breaks
- Enhanced monitoring for symptoms

4. TRAINING VERIFICATION (Mandatory)

- Ensure all affected workers have received heat illness prevention training
- Training must be completed before exposure to heat hazards
- Verify training is current (within past 2 years)
- Provide refresher information during pre-shift meetings

5. EMPLOYEE MONITORING (Mandatory)

- Supervisor or designee monitors workers for signs of heat illness
- Observation frequency: At least every hour
- Watch for:
 - Physical symptoms (heavy sweating, flushed skin, stumbling)
 - Behavioral changes (confusion, irritability, decreased performance)
 - Verbal complaints (headache, dizziness, nausea)
- Immediately respond to any signs or symptoms

6. COMMUNICATION (Mandatory)

- Ensure effective communication between workers and supervisor
- Workers must be able to contact supervisor or summon help
- Methods may include:
 - Direct voice communication
 - Two-way radios
 - Cell phones (if reliable)
 - Other reliable means
- Emergency contact procedures must be established

7. EMERGENCY PROCEDURES VERIFICATION (Mandatory)

- Verify emergency response procedures are in place
- Ensure workers know how to summon emergency services
- Confirm clear directions to worksite available for EMS
- Review recognition and response procedures with crew

11.1.5. High Heat Trigger (90°F) - Enhanced Required Actions

When temperature or heat index reaches **90°F**, implement **ALL Initial Heat Trigger requirements PLUS the following enhanced measures:**

1. ENHANCED MONITORING (Mandatory)

Close observation of ALL workers by supervisor or designee:



Observation Method (implement at least one):

Option A - Direct Supervision:

- One supervisor or designee per 20 workers maximum
- Supervisor maintains direct awareness of all workers
- Regular face-to-face contact

Option B - Mandatory Buddy System:

- Workers paired and responsible for observing each other
- Buddies maintain visual or voice contact
- Report concerns to supervisor immediately

Option C - Regular Communication:

- For workers not in visual range of supervisor
- Check-ins at least every 30 minutes
- Use of radios, phones, or other reliable communication
- Worker must respond to each check-in

Option D - Combination Approach:

- Mix of above methods appropriate to work configuration

Additional Monitoring Requirements:

- Watch for alertness and signs of heat illness
- Pay special attention during first 4 hours of shift (highest risk period)
- Immediately respond to any concerning observations
- Do not leave workers unmonitored

2. MANDATORY REST BREAKS (Mandatory)

Implement scheduled work/rest cycles:

Minimum Break Schedule:

- Light work: 10-minute break every 2 hours minimum
- Moderate work: 15-minute break every 2 hours minimum
- Heavy work: 15-minute break every hour minimum

Breaks must be:

- In addition to meal periods
- Taken in cool-down areas
- Actually rested (not working)
- Paid time
- Not combined with meal periods unless break duration extended

3. PRE-SHIFT MEETING (Mandatory)

Conduct meeting before work begins covering:

- Current and forecasted temperature/heat index



- High heat procedures in effect
- Mandatory break schedule
- Importance of drinking water (at least 4 cups per hour)
- Symptoms of heat illness
- Right to take additional breaks and stop work if needed
- Emergency procedures
- Questions and concerns

Duration: 5-10 minutes minimum

4. REMINDER SYSTEM (Mandatory)

Supervisor actively reminds workers throughout shift to:

- Drink water frequently
- Take scheduled breaks
- Use cool-down areas
- Report any symptoms immediately

Methods:

- Verbal reminders at regular intervals
- Signage at work areas
- Automated reminders (if technology available)
- Supervisor modeling behavior (drinking water visibly)

5. COMMUNICATION VERIFICATION (Mandatory)

Verify effective communication maintained between supervisor and workers:

- Test communication systems at start of shift
- Ensure all workers have access to communication method
- Backup communication method available
- Emergency contact numbers accessible to all

6. WORK MODIFICATION CONSIDERATION (Mandatory Assessment)

Supervisor must evaluate whether work can be modified to reduce heat stress.

Modifications to Consider:

- Reduce work pace or intensity
- Rotate workers more frequently among tasks
- Increase staffing to reduce individual workload
- Postpone non-urgent strenuous tasks to cooler times
- Shorten work periods
- Provide additional rest breaks beyond minimum
- Move work to cooler locations if possible

Decision Factors:



- Work urgency and importance
- Availability of alternatives
- Worker condition and acclimatization
- Effectiveness of other controls

11.1.6. Extreme Heat Procedures (100°F+)

When temperature or heat index reaches 100°F or higher, implement ALL High Heat Trigger requirements PLUS:

1. WORK CONTINUATION ASSESSMENT (Mandatory)

Unit head and EHS must evaluate whether work should continue.

Factors to Consider:

- Actual temperature/heat index
- Work intensity and duration required
- Acclimatization status of workers
- Effectiveness of available controls
- Whether work is urgent/emergency nature
- Availability of engineering controls (cooling)
- Personal risk factors of workers

Options:

- Postpone work until cooler conditions
- Modify work to reduce intensity/duration
- Implement additional controls (cooling vests, more breaks, etc.)
- Continue with maximum precautions
- Suspend work until conditions improve

2. INCREASED BREAK FREQUENCY (Mandatory if work continues)

- Minimum: 15-minute break every hour for moderate work
- Heavy work: 15-minute break every 30-45 minutes or work/rest ratio of 1:1
- Longer breaks if workers not adequately cooled

3. MAXIMUM MONITORING (Mandatory if work continues)

- Continuous or near-continuous observation
- Check on each worker every 15-30 minutes minimum
- Watch for subtle behavioral changes
- Lower threshold for removing workers from heat

4. ENHANCED COOLING MEASURES (Mandatory if work continues)

- Provide cooling vests if appropriate for work
- Increase availability of ice and cold water
- Provide cooling towels
- Use misting fans in break areas



- Ensure A/C in vehicles/trailers functioning
- Consider ice water immersion capability for emergencies

5. ADMINISTRATIVE APPROVAL (Required at 105°F+)

Work continuation at heat index $\geq 105^{\circ}\text{F}$ requires:

- Written approval from unit head
- Consultation with EHS
- Documented justification for continuing work
- Enhanced controls in place
- Continuous monitoring plan
- Emergency response preparedness confirmed

6. WORK SUSPENSION CONSIDERATION (Strongly Recommended at 110°F+)

At heat index of 110°F or higher:

- Seriously evaluate whether work can be safely performed
- Presume work should be suspended unless compelling emergency
- If work continues, maximum precautions required
- Senior administration notification
- EHS oversight of operations

11.1.7. Heat Wave Enhanced Requirements

During heat wave conditions (current day $\geq 80^{\circ}\text{F}$ AND $\geq 10^{\circ}\text{F}$ hotter than 5-day average):

All Workers - Even if Acclimatized:

- Close observation required (same as High Heat Trigger)
- Enhanced monitoring for subtle signs
- Encourage self-pacing
- Allow extra breaks
- Increase water consumption emphasis

Rationale:

- Sudden temperature increases stress even acclimatized workers
- Nighttime recovery may be insufficient
- Cumulative effect over multiple hot days
- Historical data shows increased heat illness during heat waves

Duration:

- Enhanced requirements continue throughout heat wave
- Remain in effect until temperatures return to near-normal for 2 consecutive days

11.1.8. Indoor Heat Trigger Temperatures



For indoor work environments without effective climate control:

Initial Indoor Heat Trigger: 82°F

- Implement water, cool-down, monitoring per Section 10.4
- Assess feasibility of engineering controls (fans, A/C, ventilation)

High Indoor Heat Trigger: 87°F

- Implement all High Heat Trigger requirements per Section 10.5
- Mandatory implementation of engineering controls if feasible
- If engineering controls cannot reduce temperature below 87°F:
 - Use administrative controls (work/rest schedules, rotation)
 - Document why engineering controls not feasible
 - Implement maximum administrative controls

Additional Indoor Considerations:

When temperature $\geq 82^{\circ}\text{F}$ AND workers wear heat-restrictive clothing (full-body coverage, waterproof, chemical protective):

- Treat as High Heat Trigger even if below 87°F
- Additional breaks required
- Consider cooling vests under PPE
- Enhanced monitoring

When temperature $\geq 82^{\circ}\text{F}$ in high radiant heat areas (near furnaces, ovens, foundries):

- Treat as High Heat Trigger
- Shield workers from radiant heat sources
- Provide additional cooling
- Increase break frequency

Measurement:

- Measure temperature at locations where workers actually work
- Use calibrated thermometers
- Measure at breathing zone height
- Document measurements

11.1.9. Adjustments for Work Intensity

The following table provides guidance on adjusting controls based on work intensity at various temperatures:

LIGHT WORK (Sitting/standing with light hand work, walking slowly)

Temperature/Heat Index	Actions Required
< 80°F	General awareness, water available



Temperature/Heat Index	Actions Required
80-89°F	Initial Heat Trigger requirements
90-99°F	High Heat Trigger; 10-min break every 2 hours
100-104°F	15-min break every 2 hours; enhanced monitoring
105°F+	15-min break every hour; consider work modification

MODERATE WORK (Walking with moderate lifting, pushing/pulling, sustained arm work)

Temperature/Heat Index	Actions Required
< 80°F	General awareness, water available
80-89°F	Initial Heat Trigger requirements; monitor closely
90-99°F	High Heat Trigger; 15-min break every 2 hours
100-104°F	15-min break every hour; serious work modification consideration
105°F+	15-min break every 45 min; strongly consider postponing

HEAVY WORK (Intense lifting, digging, carrying heavy loads, vigorous activity)

Temperature/Heat Index	Actions Required
< 80°F	Water available, monitor workers
80-89°F	Initial Heat Trigger; 10-min break every hour
90-99°F	High Heat Trigger; 15-min break every hour minimum
100-104°F	15-min break every 30-45 min; modify work or postpone
105°F+	Work/rest ratio 1:1; seriously consider suspending work

Note: These are minimum requirements. Supervisors should provide more frequent breaks if workers show any signs of heat stress or request additional breaks.

11.1.10. Documentation Requirements

For each work period when heat triggers are reached:

Daily Documentation:

- Date and location
- Temperature/heat index at start, midpoint, and end of work
- Trigger level reached (80°F, 90°F, 100°F+)
- Controls implemented
- Break times and durations



- Water consumption reminders given
- Any symptoms observed or reported
- Any modifications made to work

Forms:

- Heat Illness Prevention Daily Checklist
- Work/Rest Schedule Log

Retention:

- Daily checklists: 1 year
- Incident reports: Permanent
- Training records: Duration of employment + 3 years



11.2. ACCLIMATIZATION PROCEDURES

11.2.1. Importance of Acclimatization

Acclimatization is one of the most critical factors in preventing heat illness. Non-acclimatized workers are at dramatically increased risk.

Statistics:

- 50-70% of heat-related fatalities occur during the first few days of heat exposure
- Workers are 6-8 times more likely to experience heat illness during their first week
- Proper acclimatization reduces risk by 50% or more

Physiological Changes During Acclimatization:

- Increased sweat production
- Earlier onset of sweating
- Reduced salt loss in sweat
- Increased blood volume
- Improved cardiovascular efficiency
- Lower core body temperature during work
- Reduced perceived exertion

Timeline:

- Initial adaptations: Days 1-4
- Significant improvement: Days 5-7
- Near-complete acclimatization: Days 8-14
- Full acclimatization: Days 14-21

11.2.2. Who Requires Acclimatization

Acclimatization procedures must be implemented for all exposed workers, under the following conditions:

1. New Workers

- Starting work in heat for first time at University
- Transferring to heat-exposed position from climate-controlled work
- New to physically demanding work in heat

2. Returning Workers

- Returning after 7 or more consecutive days away from heat exposure
- Examples: vacation, illness, injury leave, assignment to different duties

3. All Workers During Heat Wave

- When temperatures rise $\geq 10^{\circ}\text{F}$ above recent 5-day average
- Even previously acclimatized workers need adjustment



4. Workers Resuming Work After Illness/Injury

- Any illness or injury, even if only missed 2-3 days
- Particularly gastrointestinal illness (affects hydration)
- Medical clearance may be required

5. Seasonal Workers

- At start of each hot season
- Cannot assume acclimatization from previous year

11.2.3. Acclimatization Protocols

11.2.3.1. New Or Returning Workers

The following graduated exposure schedule must be implemented:

Days 1-2:

- Work Exposure: 20% of normal work time/intensity in heat
- Example: If normal work is 8 hours, limit to 1.5-2 hours in heat on Days 1-2
- Alternative: 20% of normal work intensity for full day (very light duty)
- Supervision: Very close - supervisor checks every 15-30 minutes minimum
- Breaks: Extra breaks beyond normal schedule
- Hydration: Aggressive promotion - ensure drinking at least 1 cup every 15 minutes
- Buddy System: Mandatory - never work alone
- Location: Start with lower-heat exposure tasks if possible

Days 3-4:

- Work Exposure: 40% of normal work time/intensity
- Example: 3-4 hours in heat, or 40% intensity
- Supervision: Close observation continues - checks every 30-45 minutes
- Breaks: Frequent breaks continue
- Hydration: Continue aggressive promotion
- Buddy System: Continue

Days 5-7:

- Work Exposure: 60% of normal work time/intensity
- Example: 5-6 hours in heat, or 60% intensity
- Supervision: Regular monitoring - checks every hour
- Work Types: Can begin introducing more demanding tasks gradually

Days 8-14:

- Work Exposure: 80% of normal work time/intensity



- Supervision: Transition to normal monitoring levels
- Assessment: Evaluate worker's adaptation - any concerns require extension

Day 14+:

- Work Exposure: 100% - full normal duties
- Note: Full acclimatization typically achieved by day 14-21
- Monitoring: Continue regular observation

CRITICAL RULES:

1. Never Skip Steps - Rapid progression is dangerous
2. Extend if Needed - If worker shows any difficulty, slow the progression
3. Restart if Interrupted - If worker misses 3+ consecutive days during acclimatization, restart from Day 1
4. Document Progress - Track daily progression on acclimatization log
5. Worker Input - Ask worker how they're feeling; don't just observe

11.2.3.2. Workers During Heat Wave

When heat wave occurs ($\geq 10^{\circ}\text{F}$ increase from recent average), ALL Workers (Even Previously Acclimatized):

Days 1-2 of Heat Wave:

- Reduce work intensity by 20-30% if feasible
- Increase break frequency
- Very close monitoring
- Allow self-pacing
- Enhance hydration reminders

Days 3-7 of Heat Wave:

- Workers should be adapting
- Continue enhanced monitoring
- Maintain increased break frequency
- Assess daily - extend precautions if needed

Return to Normal:

- After temperatures return to near-average for 2 consecutive days
- Gradual transition back to normal work levels

11.2.3.3. Special Considerations

Older Workers (Age 55+):

- May take longer to acclimatize
- Consider extending acclimatization period to 21 days
- Extra monitoring
- More gradual progression



Workers with Medical Conditions:

- Consult with Occupational Health before starting
- May need individualized acclimatization plan
- Medical monitoring may be required
- Consider work restrictions

Workers on Medications:

- Some medications impair heat regulation (diuretics, antihistamines, beta-blockers, etc.)
- Review medications with Occupational Health
- May need modified acclimatization protocol

Previous Heat Illness:

- Workers with history of heat illness may be more susceptible
- Extended acclimatization period recommended
- Medical clearance required
- Very close monitoring



11.3. HYDRATION AND REST BREAK REQUIREMENTS

11.3.1. Hydration Requirements - Water Provision

Minimum Water Requirements:

Quantity:

- Provide at least 1 quart (32 oz) per employee per hour for entire shift
- Calculate total: (# of workers) × (hours of shift) × (1 quart) = minimum quarts needed
- Example: 10 workers, 8-hour shift = 80 quarts (20 gallons) minimum
- Begin shift with sufficient quantity OR have effective replenishment procedures

Quality:

- Potable (safe drinking water)
- Fresh (not stale or contaminated)
- Clean (dispensers/containers cleaned regularly - at minimum weekly)
- Suitably cool: 50-60°F recommended (39-59°F optimal range)
- Use ice, coolers, or refrigeration to maintain temperature

Accessibility:

- Located as close as practicable to work areas
- Maximum distance: 5-minute walk from any work location
- Available at all times during work hours
- No barriers to access
- Readily available - workers don't need permission to get water

Types of Water Sources:

Acceptable:

- Large coolers with individual cups
- Water bottles for individual workers
- Hydration packs (backpack style)
- Drinking fountains if located near work area
- Bottled water distribution
- Combination of sources

Containers:

- Insulated coolers with spigots (most common)
- Disposable cups provided (use once and discard)
- Or individual worker water bottles (marked with names)
- Clean cups/bottles - never share

Maintenance:

- Coolers: Drain and sanitize at least weekly
- Wipe exterior clean daily



- Inspect spigots for leaks or contamination
- Replace damaged containers
- Ice: Use potable water for ice; keep ice scoop clean

11.3.2. Hydration Requirements - Employee Practices

How Much to Drink:

General Guideline:

- At least 1 cup (8 oz) every 15-20 minutes when working in heat
- Equivalent to 3-4 cups per hour
- More if sweating heavily

By Temperature:

- 80-89°F: Minimum 1 quart (4 cups) per hour
- 90-99°F: 1-1.5 quarts (4-6 cups) per hour
- 100°F+: 1.5-2 quarts (6-8 cups) per hour or more

By Work Intensity:

- Light work: 3-4 cups per hour
- Moderate work: 4-6 cups per hour
- Heavy work: 6-8 cups per hour

Critical Rules:

- Drink BEFORE feeling thirsty (thirst means already becoming dehydrated)
- Drink throughout the day, not just at breaks
- Continue drinking after work to rehydrate
- Drink water even if not sweating (you may be dehydrated and not sweating)

Hydration Strategy:

- Start shift well-hydrated (drink 2-3 cups 20-30 minutes before work)
- Drink regularly throughout shift
- Drink even if not thirsty
- Pace drinking - don't chug large amounts at once
- Drink 2-3 cups after shift to replace additional losses

11.3.3. What to Drink

Primary: Water

- Water should be the primary fluid consumed
- Best for hydration
- No calories or additives needed for most work

Electrolyte Drinks: Consider sports drinks or electrolyte solutions when:

- Working more than 2 hours in high heat



- Sweating heavily
- Heavy physical work
- Multiple consecutive days in heat

Recommended Ratio:

- Alternate water and electrolyte drinks
- Example: 2-3 cups water, then 1 cup sports drink

AVOID or LIMIT:

- Caffeine (coffee, energy drinks, sodas):
 - Can increase urination (fluid loss)
 - Limit to morning consumption
 - Don't rely on caffeinated drinks for hydration
- Alcohol (previous 24 hours):
 - Significantly increases dehydration risk
 - Impairs heat regulation
 - Workers should avoid alcohol night before working in heat
- Very sugary drinks:
 - Can slow absorption
 - May cause stomach upset during work

11.3.4. Monitoring Hydration Status

Workers Should Self-Monitor:

Urine Color Test (most practical):

- Pale yellow or clear: Well hydrated ✓
- Dark yellow or amber: Dehydrated - drink more X
- Check color at each bathroom break

Other Signs of Adequate Hydration:

- Urinating regularly (every 2-3 hours)
- No excessive thirst
- Moist mouth and lips
- Normal skin elasticity

Signs of Dehydration:

- Dark urine
- Infrequent urination (< 3-4 times per shift)
- Excessive thirst
- Dry mouth
- Headache
- Dizziness
- Fatigue
- Rapid heartbeat



Action if Dehydrated:

- Increase water intake immediately
- Take break in cool area
- Monitor symptoms
- Report to supervisor if symptoms persist
- Do not continue heavy work if significantly dehydrated

11.3.5. Supervisor Responsibilities for Hydration

Provide Resources:

- Ensure adequate water available at start of shift
- Replenish water as needed throughout day
- Maintain water quality (cool, clean, fresh)
- Position water close to work areas
- Provide cups or bottles

Encourage Fluid Consumption:

- Remind workers to drink at start of shift
- Give periodic reminders throughout day
- Lead by example - drink water visibly
- Make it easy and expected to get water
- Create culture where drinking water is normal, not an interruption

Monitor Consumption:

- Observe whether workers are drinking
- If not seeing workers drink, remind them
- Watch for signs of dehydration in workers
- Intervene if worker not drinking enough

Break Schedule:

- Incorporate water breaks into work/rest schedule
- Don't make workers choose between break time and getting water
- Water breaks should be additional to rest breaks or built into rest breaks

Communication:

- Include hydration reminder in pre-shift meeting
- Discuss importance, not just "water is available"
- Emphasize drinking before thirsty
- Create environment where taking water breaks is encouraged

11.3.6. Rest Break Requirements - General Principles

Purpose of Rest Breaks:

- Allow body to cool down
- Prevent heat accumulation
- Maintain safe core body temperature



- Reduce overall heat stress
- Provide hydration opportunity

Types of Rest Breaks:

1. Scheduled Rest Breaks (Mandatory at $\geq 90^{\circ}\text{F}$)
 - Required at regular intervals based on work intensity and temperature
 - Duration and frequency specified in work/rest schedules
 - Must be taken in cool-down areas
 - Not optional
2. Preventive Cool-Down Breaks (Available ANY TIME at $\geq 80^{\circ}\text{F}$)
 - Worker-initiated when feeling need to cool down
 - Minimum 5 minutes
 - Available in addition to scheduled breaks
 - No questions asked - worker's decision
3. Meal Periods
 - Regular meal breaks per labor regulations
 - Separate from rest breaks
 - Also should be in cool areas when possible

11.3.7. Preventive Cool-Down Breaks ($80^{\circ}\text{F}+$)

When Available:

- Any time temperature or heat index $\geq 80^{\circ}\text{F}$
- Worker-initiated - no supervisor permission required
- Can be taken ANY TIME worker feels need

Requirements:

- Minimum 5 minutes
- In cool-down area (shade or $\leq 82^{\circ}\text{F}$)
- Actually resting (not working)
- In addition to scheduled breaks

Supervisor Responsibilities:

- Allow breaks without question
- Never deny or discourage cool-down breaks
- Monitor worker during break
- Ask if worker experiencing symptoms
- Worker cannot be ordered back to work until:
 - Minimum time elapsed (5 minutes + travel time)
 - Any symptoms resolved
 - Worker indicates ready to return

Worker Responsibilities:

- Take break when feeling hot or fatigued
- Don't try to "tough it out"
- Use full break time



- Drink water during break
- Report any symptoms to supervisor

No Retaliation:

- Workers cannot be disciplined for taking preventive cool-down breaks
- Taking breaks is exercising a safety right
- Supervisors who discourage breaks subject to discipline

11.3.8. Mandatory Rest Break Schedules (90°F+)

When temperature/heat index reaches **90°F**, implement mandatory scheduled rest breaks:

MINIMUM BREAK SCHEDULES BY WORK INTENSITY:

LIGHT WORK (Sitting, standing, light hand work)

Temperature	Break Schedule
90-99°F	10 minutes every 2 hours
100-104°F	15 minutes every 2 hours
105°F+	15 minutes every hour

MODERATE WORK

(Walking, moderate lifting, sustained arm work)

Temperature	Break Schedule
90-99°F	15 minutes every 2 hours
100-104°F	15 minutes every hour
105°F+	15 minutes every 45 minutes

HEAVY WORK (Intense lifting, digging, carrying, vigorous activity)

Temperature	Break Schedule
90-99°F	15 minutes every hour
100-104°F	15 minutes every 30-45 minutes
105°F+	Work/rest ratio approaching 1:1

Important Notes:

- These are MINIMUM requirements
- More frequent/longer breaks should be provided if:
 - Workers show any heat stress signs
 - Humidity is very high
 - Workers are not fully acclimatized
 - Workers wearing heat-restrictive PPE
 - Workers request additional breaks



- Breaks are IN ADDITION to meal periods
- All breaks must be in cool-down areas
- Breaks are paid time

11.3.9. Work/Rest Ratio Approach (Alternative Method)

For very hot conditions (100°F+) or heavy work, may use work/rest ratio:

Work/Rest Ratios by Temperature (Heavy Work):

Temperature	Work : Rest Ratio	Example Schedule
100-104°F	3:1	45 min work / 15 min rest
105-109°F	2:1	40 min work / 20 min rest
110°F+	1:1	30 min work / 30 min rest

How to Use:

- Determine temperature and work intensity
- Select appropriate ratio
- Create repeating cycle throughout shift
- Adjust if workers show heat stress

Example: At 103°F doing heavy work

- Work/rest ratio: 3:1
- Possible schedule: 45 minutes work, 15 minutes rest
- Repeat cycle throughout shift
- Workers get 15-minute break every hour

11.3.10. Break Area Requirements

All breaks must be taken in designated cool-down areas that meet the following:

Temperature:

- Indoor areas: ≤82°F
- Outdoor areas: Effectively shaded and cooled to extent feasible

Shade (Outdoor Areas):

- Blocks direct sunlight effectively
- Objects in shade should not cast additional shadows
- Shields from radiant heat sources
- Preferably with air movement (fans, natural breeze)

Size:

- Large enough for all workers on break simultaneously
- Workers can sit comfortably
- Not crowded or touching each other



Location:

- As close as practicable to work area
- Travel time to/from shade not counted against break time
- Easily accessible

Amenities:

- Seating (chairs, benches, or ground covering)
- Water available in break area
- First aid supplies nearby
- Communication to supervisor possible

Types of Cool-Down Areas:

- Shaded outdoor areas (trees, canopies, structures)
- Air-conditioned buildings or trailers
- Tents with fans or misters
- Vehicles with A/C
- Any combination meeting temperature requirements

Prohibited Areas:

- Areas with safety hazards
- Areas that discourage or prevent use
- Areas with poor conditions (dirty, uncomfortable)
- Areas where workers exposed to other hazards

11.3.11. Rest Break Documentation

Supervisors should document:

- Date and temperature/heat index
- Work/rest schedule in effect
- Actual break times (at minimum, verify breaks were taken)
- Any deviations or additional breaks provided
- Any worker complaints or symptoms

11.3.12. Special Situations

Working Alone:

- Solo workers still entitled to breaks
- Must have communication method
- Call in before and after each break
- Supervisor verifies breaks taken

Short-Duration Tasks:

- Tasks < 1 hour may not require scheduled break
- Preventive cool-down breaks still available if needed
- Workers should rest before and after if doing multiple short tasks



Variable Work Intensity:

- Use schedule for highest intensity work performed
- Example: If mostly moderate but some heavy, use heavy work schedule during heavy work periods

Acclimatization Period:

- New/returning workers may need MORE frequent breaks
- Adjust schedule to worker's current tolerance
- Err on side of more breaks

Heat-Restrictive Clothing:

- Workers in full PPE need more frequent breaks
- Consider cooling vests
- May need break every 30-45 minutes regardless of temperature

Multiple Work Locations:

- If moving between sites, ensure cool-down areas at each location
- Travel time between sites not counted as break time
- Don't skip breaks because "we're about to move"



11.4. HEAT ILLNESS RECOGNITION AND EMERGENCY RESPONSE

11.4.1. Types of Heat Illness - Overview

Heat illnesses range from minor conditions to life-threatening emergencies. All must be taken seriously.

Severity Progression:

1. Heat Rash (minor discomfort)
2. Heat Cramps (painful but not dangerous)
3. Heat Syncope/Fainting (concerning, requires attention)
4. Heat Exhaustion (serious, can progress to heat stroke)
5. **Heat Stroke (MEDICAL EMERGENCY - can be fatal)**

Key Principle: When in doubt about severity, treat as more serious and get medical help.

11.4.2. Heat Rash (Prickly Heat)

Description: Skin irritation from excessive sweating; sweat ducts become blocked.

Signs and Symptoms:

- Red, bumpy rash
- Small blisters
- Prickling or itching sensation
- Usually on neck, chest, groin, elbow creases
- Skin stays wet from sweat

Treatment:

- Move to cool, dry environment
- Allow skin to dry
- Remove excess clothing if appropriate
- Apply cool compresses
- Calamine lotion or hydrocortisone cream may help
- Keep area dry and cool
- Loose-fitting, breathable clothing

Prevention:

- Keep skin dry when possible
- Shower and dry thoroughly after work
- Wear moisture-wicking clothing
- Use powder to reduce friction

Return to Work:

- May continue work if mild and comfortable
- Avoid conditions that increase sweating if severe
- Address any underlying heat exposure issues



11.4.3. Heat Cramps

Description: Painful muscle spasms caused by electrolyte imbalance from heavy sweating.

Signs and Symptoms:

- Painful cramps or spasms in muscles
- Usually in legs, arms, or abdomen
- Muscles used for work most commonly affected
- Heavy sweating
- Thirst
- Fatigue

Treatment:

1. Stop work immediately
2. Move to cool area
3. Rest affected muscles
4. Drink water or electrolyte beverage
5. Gently stretch and massage cramped muscles
6. Do not resume work in heat that day
7. Seek medical attention if:
 - Cramps last > 1 hour
 - Person on low-sodium diet
 - Person has heart problems

When to Call 911:

- If cramps are severe and don't improve
- If person has heart problems
- If person is nauseated and can't drink

Return to Work:

- Not same day as cramps occurred
- Ensure well-hydrated before returning
- May need medical clearance
- Review hydration and electrolyte intake

Prevention:

- Adequate water AND electrolyte intake
- Drink sports drinks if sweating heavily
- Salty snacks with water
- Proper acclimatization

11.4.4. Heat Syncope (Fainting)

Description: Fainting or dizziness from heat exposure, usually when standing from seated/squatting position.



Signs and Symptoms:

- Dizziness or lightheadedness
- Fainting or brief loss of consciousness
- Pale, cool, moist skin
- Weak pulse
- Nausea
- Usually occurs when standing up quickly

Treatment:

1. Lay person down or have them sit with head between knees
2. Move to cool area
3. Loosen tight clothing
4. Have person drink water if conscious
5. Person should lie down for 15-30 minutes
6. Monitor for other heat illness symptoms
7. Seek medical attention if:
 - Person doesn't recover quickly (within a few minutes)
 - Loss of consciousness lasted > few seconds
 - Any other concerning symptoms present
 - Person injured during fall

When to Call 911:

- If person doesn't regain consciousness quickly
- If person hit head during fall
- If other serious symptoms develop

Return to Work:

- Not immediately after fainting
- Must feel completely normal
- Evaluate why syncope occurred
- Ensure well-hydrated
- May need medical clearance

11.4.5. Heat Exhaustion

Description: Serious condition from excessive loss of water and salt through sweating. Can progress to heat stroke if not treated.

Signs and Symptoms:

- Heavy sweating (key sign)
- Cool, pale, clammy skin
- Weakness or fatigue (extreme tiredness)
- Dizziness or lightheadedness
- Headache (often severe)
- Nausea or vomiting



- Muscle cramps
- Rapid, weak pulse
- Rapid, shallow breathing
- Fainting or near-fainting
- Irritability or confusion (mild)
- Dark-colored urine or decreased urination
- Body temperature may be normal or slightly elevated

Treatment:

1. STOP WORK IMMEDIATELY
2. Move to cool area (A/C if possible, or shade with fan)
3. Lay person down and elevate legs slightly
4. Loosen or remove excess clothing
5. Cool the person:
 - Apply cool, wet cloths to skin
 - Spray with cool water and fan
 - Place ice packs on neck, armpits, groin (NOT directly on skin)
 - If available, immerse in cool water or cool shower
6. Give water to drink if person is conscious and can drink:
 - Small sips, not large amounts at once
 - Sports drink or water with salt tablet acceptable
 - About 4 ounces every 15 minutes
7. Monitor closely - watch for progression to heat stroke

When to Call 911:

- If symptoms don't improve within 30 minutes
- If symptoms get worse
- If person vomits and can't keep fluids down
- If body temperature reaches 104°F or higher
- If person becomes confused or loses consciousness
- If you're unsure - ALWAYS err on side of calling 911

CRITICAL: Heat exhaustion can rapidly progress to heat stroke. If in doubt, call 911.

After Treatment:

- Person should not return to work in heat that day
- Should rest in cool environment
- Continue drinking fluids
- Medical evaluation recommended before return to work
- Person may need several days of recovery

Return to Work:

- Medical clearance required
- Not before next day at minimum
- Full recovery confirmed



- Hydration status normalized
- Gradual return with close monitoring

11.4.6. Heat Stroke - MEDICAL EMERGENCY

Description: LIFE-THREATENING emergency. Body's temperature regulation fails. Can cause death or permanent disability. ALWAYS CALL 911.

Signs and Symptoms:

CLASSIC SIGNS (not all may be present):

- High body temperature (104°F or higher) - CRITICAL SIGN
- Hot, DRY skin (sweating has stopped) - CRITICAL SIGN
 - However, skin may still be moist in some cases (exertional heat stroke)
- Altered mental state:
 - Confusion, disorientation
 - Bizarre behavior
 - Aggression or combativeness
 - Slurred speech
 - Delirium
 - Seizures
 - Unconsciousness or coma
- Red or flushed skin
- Rapid, strong pulse OR weak pulse
- Rapid, shallow breathing
- Throbbing headache
- Nausea and vomiting

CRITICAL WARNING SIGNS:

- Confusion or strange behavior
- Loss of consciousness
- Seizure
- Very hot skin (with or without sweating)

TREATMENT - EMERGENCY PROCEDURE:

1. CALL 911 IMMEDIATELY
 - State: "Heat stroke emergency"
 - Provide exact location
 - Number of victims
 - State of consciousness
2. CALL UAPD: (520) 621-8273
3. MOVE PERSON TO COOL AREA IMMEDIATELY
 - Indoors with A/C if possible
 - Shade if indoors not available
4. BEGIN RAPID COOLING - EVERY SECOND COUNTS:



- Goal: Reduce body temperature as fast as possible
 - BEST: Ice water immersion (if large container available - fill with ice water and immerse person up to neck)
 - ALTERNATIVE COOLING METHODS:
 - Remove excess clothing
 - Spray/pour cool or ice water over person
 - Apply ice packs to neck, armpits, groin
 - Place wet sheets or towels on person and fan aggressively
 - Use any available cooling method - garden hose, shower, etc.
 - DO NOT STOP COOLING until EMS arrives or body temperature < 102°F
5. IF PERSON IS CONSCIOUS:
- Place in recovery position or lay flat
 - DO NOT give fluids (they may vomit and aspirate)
6. IF PERSON IS UNCONSCIOUS:
- Place in recovery position (on side)
 - Ensure airway is open
 - Monitor breathing
 - Be prepared to perform CPR if breathing stops
7. MONITOR CONTINUOUSLY:
- Check consciousness level
 - Check breathing
 - Check pulse
 - Continue cooling efforts
 - Provide information to EMS when they arrive

WHAT NOT TO DO:

- DO NOT give person anything to drink (aspiration risk)
- DO NOT leave person alone
- DO NOT put person in cold water if unconscious (drowning risk)
- DO NOT give medications (aspirin, acetaminophen - won't help)
- DO NOT delay calling 911 to try to cool person first - CALL IMMEDIATELY

After EMS Arrival:

- Provide information: How long in heat, symptoms observed, cooling measures taken
- Provide copy of heat illness prevention plan if available
- Identify supervisor and witnesses
- Preserve scene for investigation

Follow-Up:

- Person will be hospitalized
- Report incident to EHS immediately
- Investigation required



- Review and modify procedures
- Notify affected workers

Return to Work:

- Only with full medical clearance
- Minimum several days recovery, often weeks
- May have permanent susceptibility to heat illness
- May require work restrictions or accommodations

STATISTICS - WHY THIS IS CRITICAL:

- Heat stroke fatality rate: 10-50% even with treatment
- Rapid cooling increases survival dramatically
- Brain damage can occur in minutes
- Every minute of delay in cooling increases risk of death or disability

11.4.7. Emergency Response Procedures

Pre-Emergency Preparation:

Every worksite must have:

- Posted emergency phone numbers (911, UAPD, EHS, supervisor)
- Exact location address/description for EMS dispatch
- Map or GPS coordinates for remote locations
- Designated person to call 911 (and backup)
- Designated person to meet EMS and direct them
- First aid kit with ice packs, cool compresses
- Means of rapid cooling (water, ice, container for immersion if possible)
- Shaded or cool area for treatment
- Communication devices that work at location

Emergency Response Steps:

STEP 1: RECOGNIZE

- Any worker shows signs of heat illness
- Co-worker reports symptoms
- Supervisor observes concerning behavior
- Worker collapses or becomes unresponsive

STEP 2: ASSESS

- Check consciousness - responsive or not?
- Check for breathing
- Assess symptoms against heat illness types
- Determine severity

STEP 3: ACT

- Move person to cool area



- Call 911 if:
 - Unconscious
 - Confused/altered mental state
 - Heat stroke suspected
 - Heat exhaustion not improving
 - Any doubt about severity
- Begin cooling immediately
- Notify supervisor and EHS

STEP 4: TREAT

- Follow treatment protocols for condition (Sections 13.2-13.6)
- Monitor continuously
- Don't leave person alone
- Continue treatment until EMS arrives

STEP 5: DOCUMENT

- What happened and when
- Symptoms observed
- Treatment provided
- Response times
- Witnesses
- Complete incident report

STEP 6: INVESTIGATE

- EHS conducts investigation
- Identify root causes
- Determine corrective actions
- Prevent recurrence

11.4.8. Special Emergency Situations

Remote Locations:

- Extended EMS response time expected
- Must have enhanced first aid capability
- Consider satellite phone or emergency radio if no cell service
- Pre-plan evacuation route and method
- May need to transport victim to meet EMS
- Extra cooling supplies essential

Worker Alone:

- Check-in procedures critical
- If worker doesn't respond to check-in, investigate immediately
- Consider man-down alarms or wearable monitors
- Minimize solo work in extreme heat

Multiple Victims:



- Triage by severity
- Call for multiple ambulances
- Prioritize heat stroke victims
- Don't exhaust cooling resources on one person if others need help
- Request additional help from other units

Language Barriers:

- Use translation services if needed
- Visual assessment critical
- Have multilingual emergency guides available
- Know how to ask "Are you okay?" in languages workers speak

Violent or Combative Victim:

- Heat stroke can cause aggressive behavior
- Prioritize safety of responders and other workers
- Request police assistance if needed
- Restrain only if necessary for safety and person's treatment
- Continue cooling efforts

Athletics and Sports Activities

- While this program applies to all University activities, Athletics Unit maintains separate, sport-specific heat illness prevention protocols that meet or exceed this program:
 - Follow NCAA Inter-Association Task Force recommendations
 - Sport-specific acclimatization protocols (especially football)
 - Certified athletic trainer present at all high-risk activities
 - Wet Bulb Globe Temperature (WBGT) monitoring for outdoor sports
 - Activity modification or cancellation based on WBGT
 - Emergency action plans for each venue
 - Cold water immersion capability at all venues
 - Baseline medical screening for athletes

11.4.9. Special Accommodation Situations

Pregnant Workers

- Increased Risk Factors:
 - Pregnancy increases core body temperature
 - Increased metabolic rate
 - Changes in cardiovascular system
 - Increased blood volume but also increased demands
 - Heat can affect fetal development, especially first trimester
- Worker Responsibility:
 - Inform supervisor if medical condition or medication may increase risk
 - Consult personal physician about working in heat



- Report any symptoms immediately
 - Follow any work restrictions
- Accommodations
 - Required:
 - Pregnant workers should inform supervisor (for safety accommodations)
 - Work assessment by Occupational Health recommended
 - Earlier trigger for breaks and cooling
 - More frequent hydration
 - Lighter work assignments if available
 - Additional breaks without question
 - Avoid heat exposure during hottest hours if possible
 - Medical Consultation:
 - Pregnant workers should consult healthcare provider about heat exposure
 - Occupational Health can provide guidance
 - Work restrictions may be recommended
 - Individual accommodation plan if needed

Workers with Medical Conditions

- Conditions That Increase Heat Illness Risk:
 - Heart disease or previous heart attack
 - High blood pressure (hypertension)
 - Diabetes (Type 1 or 2)
 - Obesity
 - Lung disease (asthma, COPD)
 - Kidney disease
 - Previous heat stroke or repeated heat illness
 - Thyroid disorders
 - Skin conditions that impair sweating
- Medications That Increase Risk:
 - Diuretics ("water pills")
 - Beta-blockers (heart/blood pressure medication)
 - Antihistamines (allergy medications)
 - Antidepressants (certain types)
 - Antipsychotics
 - Stimulants (ADHD medications, weight loss drugs)
 - Some diabetes medications
 - Anticholinergics
- Worker Responsibility:
 - Inform supervisor if medical condition or medication may increase risk
 - Consult personal physician about working in heat
 - Report any symptoms immediately
 - Follow any work restrictions



- Accommodations:
 - Modified work schedule (cooler hours)
 - More frequent breaks
 - Lighter duty assignments
 - Indoor work when possible
 - Earlier trigger for breaks (e.g., at 75°F instead of 80°F)
 - Exemption from heat exposure if severe risk

Older Workers (Age 55+)

- Increased Risk Factors:
 - Decreased ability to sense heat
 - Reduced sweating capacity
 - Cardiovascular changes
 - More likely to have medical conditions
 - More likely to take heat-sensitive medications
 - Slower acclimatization
- Protective Measures:
 - More gradual acclimatization (extend to 21 days)
 - More frequent breaks
 - Enhanced monitoring by supervisor
 - Encourage aggressive hydration (may not feel thirsty)
 - Medical consultation recommended if concerns
 - Individual assessment rather than blanket restrictions

Important: Do not automatically restrict older workers - many adapt well to heat with proper precautions. Focus on individual capabilities.

Workers with Previous Heat Illness

- Increased Susceptibility:
 - History of heat stroke significantly increases future risk
 - May have permanent impairment of heat regulation
 - Psychological factors (fear/anxiety about recurrence)
- Requirements:
 - Medical clearance required after any heat illness requiring medical treatment
 - Occupational Health evaluation
 - Assessment of residual effects
 - Determination of fitness for heat exposure
- Accommodations:
 - Gradual return to heat exposure
 - Enhanced monitoring
 - More frequent breaks
 - Lower heat exposure limits



- Possible permanent restrictions depending on severity of previous illness

New Workers and Temporary Workers

- High-Risk Group:
 - Most heat deaths occur in workers' first week
 - May not be acclimatized to Arizona heat
 - Unfamiliar with procedures
 - May feel pressure to prove themselves
 - May not feel comfortable reporting symptoms
- Before Work Begins:
 - Heat illness prevention training mandatory
 - Review of specific worksite procedures
 - Identification of cool-down areas and water sources
 - Buddy assignment
- First 14 Days:
 - Acclimatization protocol strictly followed
 - Very close supervision
 - Frequent check-ins
 - No solo work
 - Extra breaks
 - Encourage questions and reporting
 - Create welcoming environment
- Supervisor Responsibilities:
 - Never pressure new workers to keep up with experienced workers
 - Watch closely for symptoms
 - Remind that acclimatization takes time
 - Reinforce that reporting symptoms is expected and valued



11.5. INDOOR HEAT ILLNESS PREVENTION

11.5.1. Indoor Heat Hazard Identification

Common Indoor Heat Sources at University:

Facilities/Operations:

- Central Plant and boiler rooms
- Mechanical rooms with equipment
- Kitchens and food service areas (ovens, grills, fryers, dishwashers)
- Laundry facilities (dryers, pressing equipment)
- Autoclaves and sterilization areas
- Laboratories with heat-producing equipment
- Greenhouses
- Non-climate-controlled warehouses and storage
- Loading docks and receiving areas
- Indoor athletic facilities during summer

Contributing Factors:

- Inadequate ventilation
- Poor air conditioning or no A/C
- Heat-producing equipment and processes
- Steam and hot water systems
- Building heat gain (poor insulation, sun exposure)
- High humidity (kitchens, laundries, greenhouses)
- Simultaneous heat and physical work demands

11.5.2. Indoor Temperature Monitoring

When to Monitor:

- Whenever workers or supervisors complain of heat
- In areas known to have heat issues
- During hot outdoor temperatures (heat transfers inside)
- When heat-producing equipment in use
- During summer months in non-climate-controlled spaces

How to Monitor:

- Use calibrated thermometers
- Measure at locations where workers actually work
- Measure at worker height (breathing zone)
- Measure during hottest part of day
- Measure during actual production/operations (equipment running)
- Document readings

Frequency:

- At start of shift in known hot areas
- Re-check every 2-4 hours



- Re-check if conditions change (more equipment turned on, outside temperature rises)
- Continuous monitoring in high-risk areas if feasible

11.5.3. Indoor Heat Trigger Temperatures

Initial Indoor Heat Trigger: 82°F

When indoor temperature reaches 82°F:

- Provide drinking water
- Ensure access to cool-down areas
- Monitor workers for heat illness signs
- Consider engineering controls to reduce temperature
- Implement break schedule if work is moderate or heavy

High Indoor Heat Trigger: 87°F

When indoor temperature reaches 87°F:

- All Initial Heat Trigger requirements PLUS:
- Engineering controls required (if feasible)
- Administrative controls required if engineering controls insufficient
- Enhanced worker monitoring
- Mandatory rest breaks
- Document why engineering controls not feasible if not implemented

Special Triggers:

If temperature $\geq 82^\circ\text{F}$ AND:

- Workers wear heat-restrictive clothing, OR
- High radiant heat area (near ovens, furnaces, equipment)

Then:

- Treat as High Heat Trigger (87°F requirements apply)

11.5.4. Indoor Engineering Controls (Hierarchy)

Engineering controls are the preferred method for controlling indoor heat. Implement in the following priority order:

1. Air Conditioning

- Install A/C if not present (capital project)
- Repair/upgrade inadequate A/C systems
- Lower thermostat setpoint in hot areas
- Ensure A/C capacity adequate for heat load

2. Ventilation Improvement

- Install exhaust fans to remove hot air



- Install supply fans to bring in cooler air (if outdoor temp lower)
- Local exhaust at heat sources (stoves, ovens, equipment)
- Increase air changes per hour
- Ensure ventilation systems properly maintained

3. Process Changes

- Isolate hot processes (enclose ovens, equipment in separate rooms)
- Schedule heat-producing activities during cooler times
- Reduce concurrent operation of multiple heat sources
- Use alternative methods that produce less heat
- Automate processes to reduce worker exposure

4. Heat Shielding and Insulation

- Insulate hot pipes, ducts, equipment surfaces
- Install reflective barriers between heat source and workers
- Heat shields around ovens, furnaces
- Thermal curtains

5. Spot Cooling

- Cooling fans directed at workers
- Misting fans or evaporative coolers
- Local air conditioning at work stations
- Air curtains to separate hot and cool areas

6. Radiant Heat Control

- Shield radiant heat sources
- Reflective surfaces to redirect heat
- Relocate work positions away from radiant sources

11.5.5. Indoor Administrative Controls

When engineering controls cannot reduce temperature below trigger levels, implement administrative controls:

1. Work Scheduling

- Perform hottest work during coolest times of day (early morning)
- Reduce heat-producing activities during peak temperature
- Stagger use of heat-producing equipment
- Limit duration of exposure to hot areas

2. Worker Rotation

- Rotate workers between hot and cooler tasks
- Limit time in hottest areas
- More workers sharing hot tasks (reduces individual exposure)

3. Work/Rest Schedules



- Implement rest breaks per Section 12
- More frequent breaks in very hot areas
- Longer breaks if needed for adequate cooling

4. Reduced Work Intensity

- Slow work pace in hot areas
- Use mechanical assists to reduce physical exertion
- Simplify tasks to reduce metabolic heat

5. Acclimatization

- Gradual introduction to hot indoor environments
- Follow acclimatization protocol

11.5.6. Indoor Cool-Down Areas

Requirements:

- Must be at or below 82°F
- Separate from hot work area
- Large enough for workers on break
- Comfortable seating
- Water available
- Clean and maintained

Options:

- Climate-controlled break rooms
- Air-conditioned offices or spaces
- Cooled storage areas
- Separate building areas
- Outside if outdoor temperature lower than indoor

Access:

- Close to work area (minimize travel time)
- Readily accessible
- No barriers to use
- Available whenever needed

11.5.7. Indoor-Specific Considerations

Humidity:

- Indoor areas may have high humidity (kitchens, laundries, greenhouses)
- High humidity prevents evaporative cooling
- Heat index more relevant than temperature alone
- Consider use of dehumidification

Radiant Heat:

- Ovens, furnaces, equipment create radiant heat



- Temperature measurement may not capture radiant heat impact
- WBGT measurement more accurate in high radiant heat areas
- Extra cooling breaks needed

Confined Spaces:

- Some indoor hot areas may also be confined spaces
- Both programs apply
- Coordinate requirements
- Enhanced hazards

Clothing:

- Kitchen staff may wear heavy uniforms, aprons
- Protective clothing in labs
- Consider lighter-weight alternatives
- Allow breathable fabrics when possible

Ventilation Cautions:

- Don't ventilate indoors with outdoor air if outdoor temperature higher
- Ensure ventilation doesn't create other hazards (spreading contaminants)
- Chemical processes may require specific ventilation

Gradual Transition:

- When moving from very hot area to very cold (freezer, cold storage), allow gradual transition
- Sudden temperature changes can be physiologically stressful

11.5.8. Documentation for Indoor Heat Hazards

Assessment Records:

- Identification of all indoor hot work areas
- Temperature measurements
- Heat sources identified
- Workers potentially affected

Control Documentation:

- Engineering controls implemented
- If engineering controls not feasible, documentation of reason
- Administrative controls in place
- Work/rest schedules

Monitoring Records:

- Temperature measurements (date, time, location, reading)
- Actions taken when triggers reached
- Worker monitoring observations



11.6. VENDOR/CONTRACTOR REQUIREMENTS

11.6.1. Vendor/Contractor Obligations

All contractors performing work on University property must:

1. Have Written Heat Illness Prevention Program
 - Contractor must have their own heat illness prevention program
 - Program must meet or exceed University of Arizona requirements
 - Program must be provided to University for review before work begins
2. Train Workers
 - All contractor workers must be trained on heat illness prevention
 - Training must meet OSHA requirements and best practices
 - Training must be documented
 - Proof of training provided to University as requested
3. Implement Heat Illness Prevention Measures
 - Follow contractor's own program
 - Comply with University requirements
 - Provide adequate water for their workers
 - Provide shade/cool-down areas for their workers
 - Monitor their workers
 - Implement acclimatization for new workers
4. Coordinate with University
 - Attend pre-work safety meetings as required
 - Coordinate emergency procedures
 - When Multiple Contractors on Same Site:
 - University coordinates heat safety among contractors
 - Joint pre-work meetings
 - Shared emergency response procedures
 - Communication among all parties
 - Avoid duplicated resources (may share shade areas if adequate size)
 - Clear assignment of responsibilities
 - Unified approach to heat advisories
 - Immediately report any heat-related illness requiring medical attention
 - Call EHS: (520) 626-6850