



Weather, Climate and Heat-Cold Injury on the Job Safety & Prevention Review

May 13, 2022 10-10:45

Solid Waste Operators Training (SWOT)

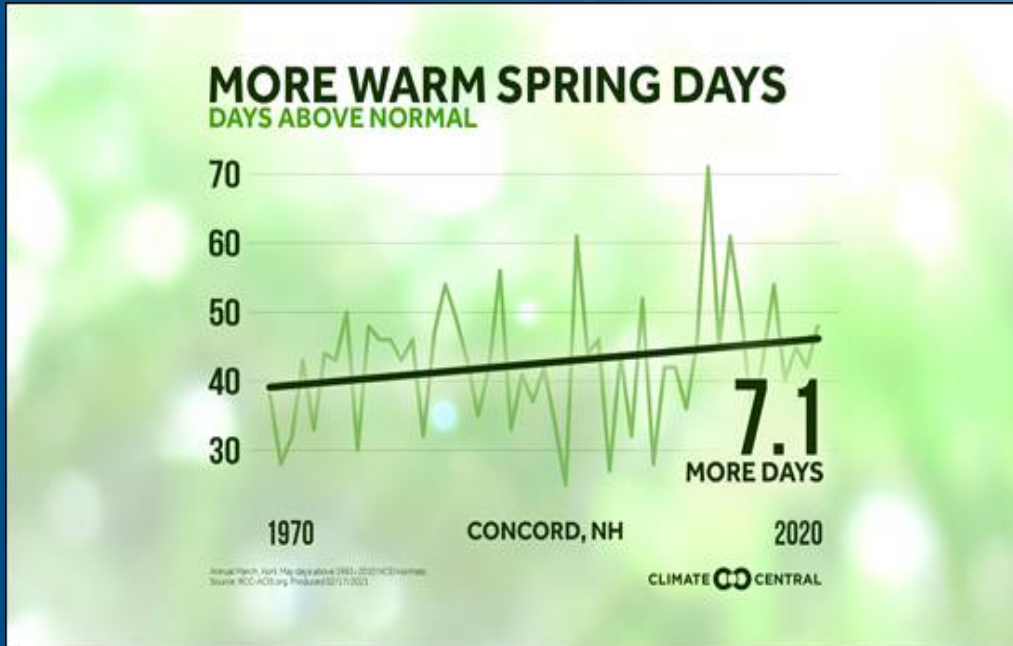
Matt Cahillane, NH DHHS

Timing = 45 mins for content & questions?

Learning Objectives

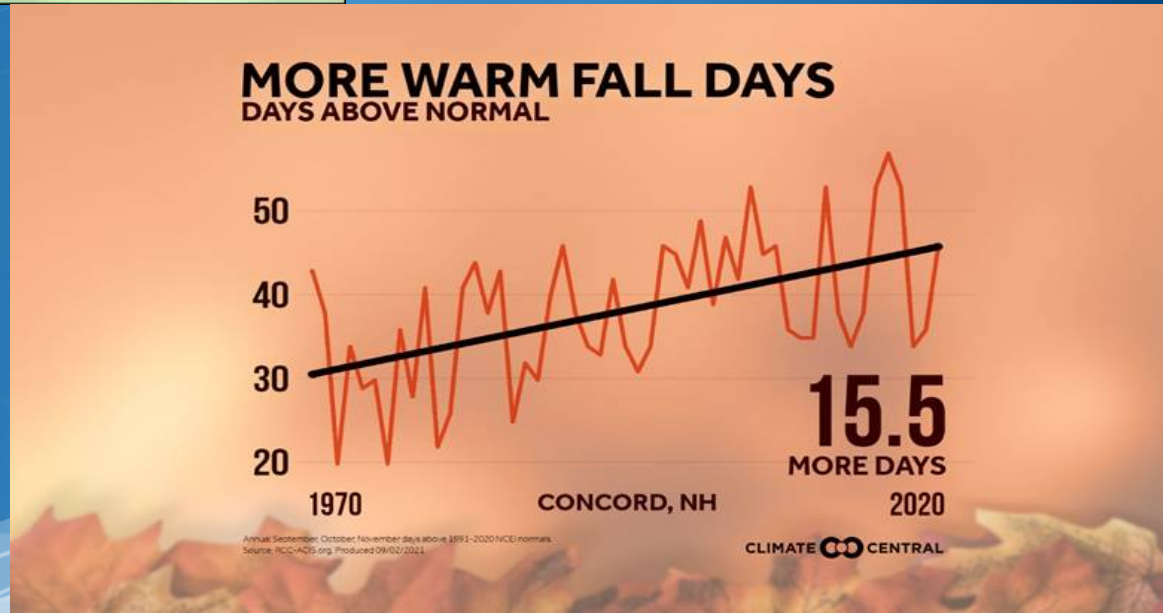
- Awareness of weather & climate trends
- How the body gains and loses heat
- Health effects of heat & cold
- Review the exposure pathway: hazard->impact
- Prevention & Response
- Relevant regulations

Fewer Days Below Freezing



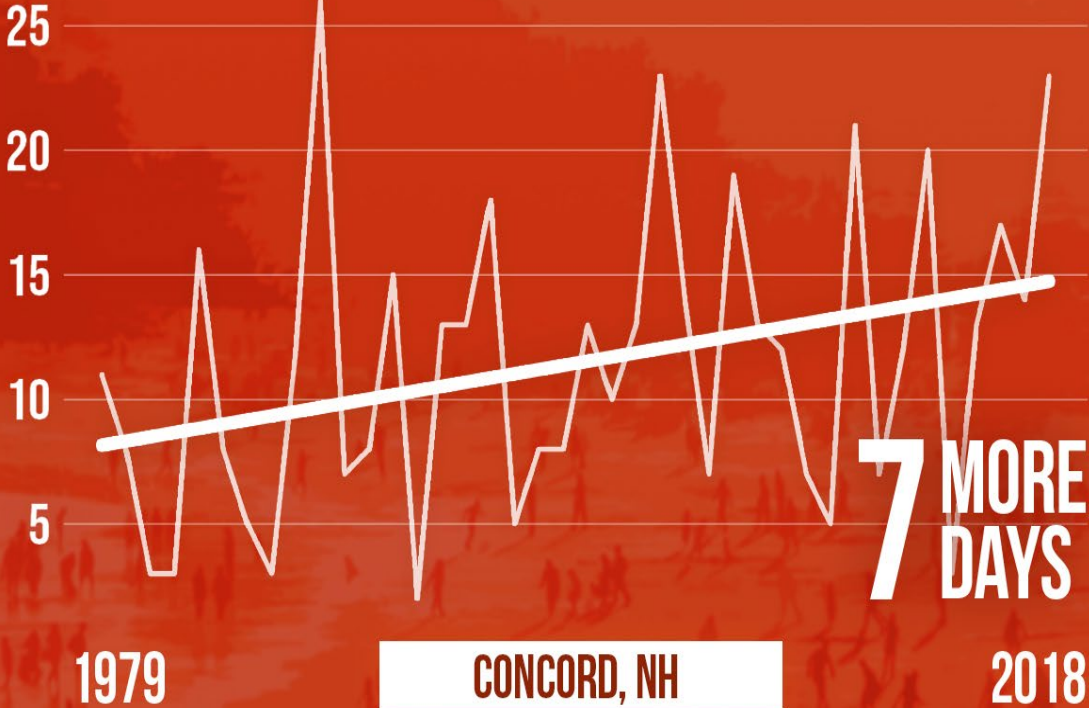
- NH warm season (frost free) has increased by about 22 days in the past 50 years

Source:
<https://www.climatecentral.org/>



More Hot Days over 90

EXTREME HEAT DAYS WITH HEAT INDEX OF 90°+



Annual days with a heat index of 90°F+
Source: gridMET minimum relative humidity & maximum temperature datasets

Cold Season Issues

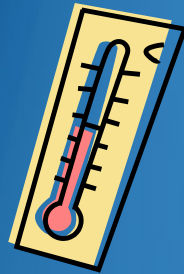
- Cooling off at work & home
- Low body core temp (hypothermia)
- Cold injury to skin & tissues (frostbite)
- Less cognitive performance, less coordination
- Slips and falls on snow & ice
- More vehicle accidents, yet less injuries

Warm Season Issues

- Overheating at work & home
- High body core temp (Hypothermia)
- Heat injury to skin & tissues (sunburn)
- Less cognitive performance/frustration
- Hot weather slips & falls
- Less vehicle accidents, yet more injury/death
- Also consider greater use of alcohol

What Conditions Affect Heat & Cold

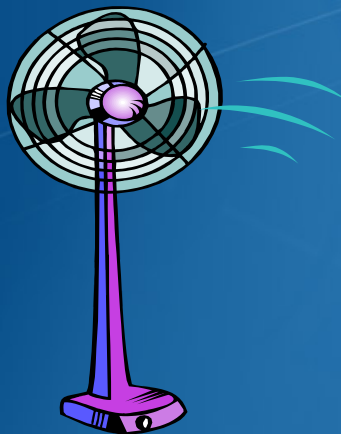
The three main environmental factors include:



Air temperature: what the thermometer reads



Wetness: humidity, damp, rain, snow, ice; sweat; wet clothes; water

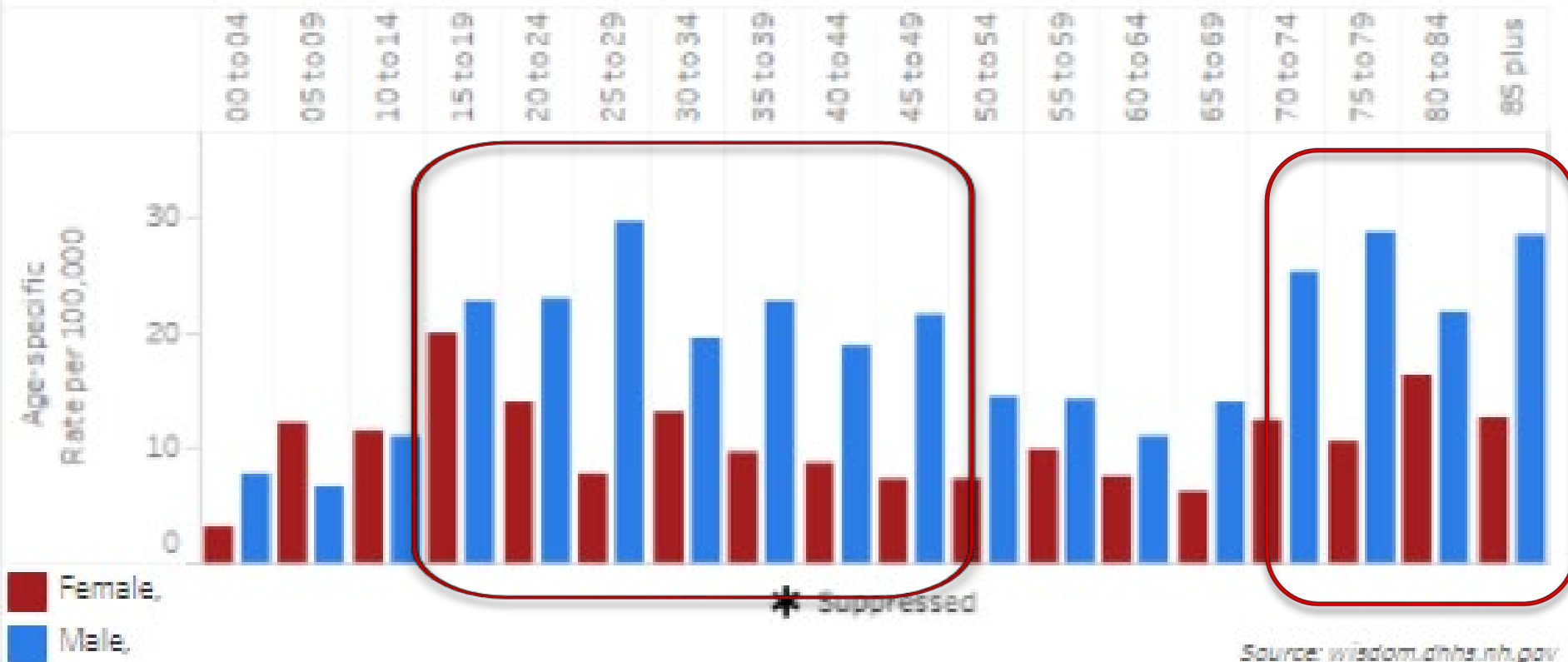


Air movement: wind speed (5 mph+); from outdoor wind, indoor fans, chillers in cold rooms, etc.

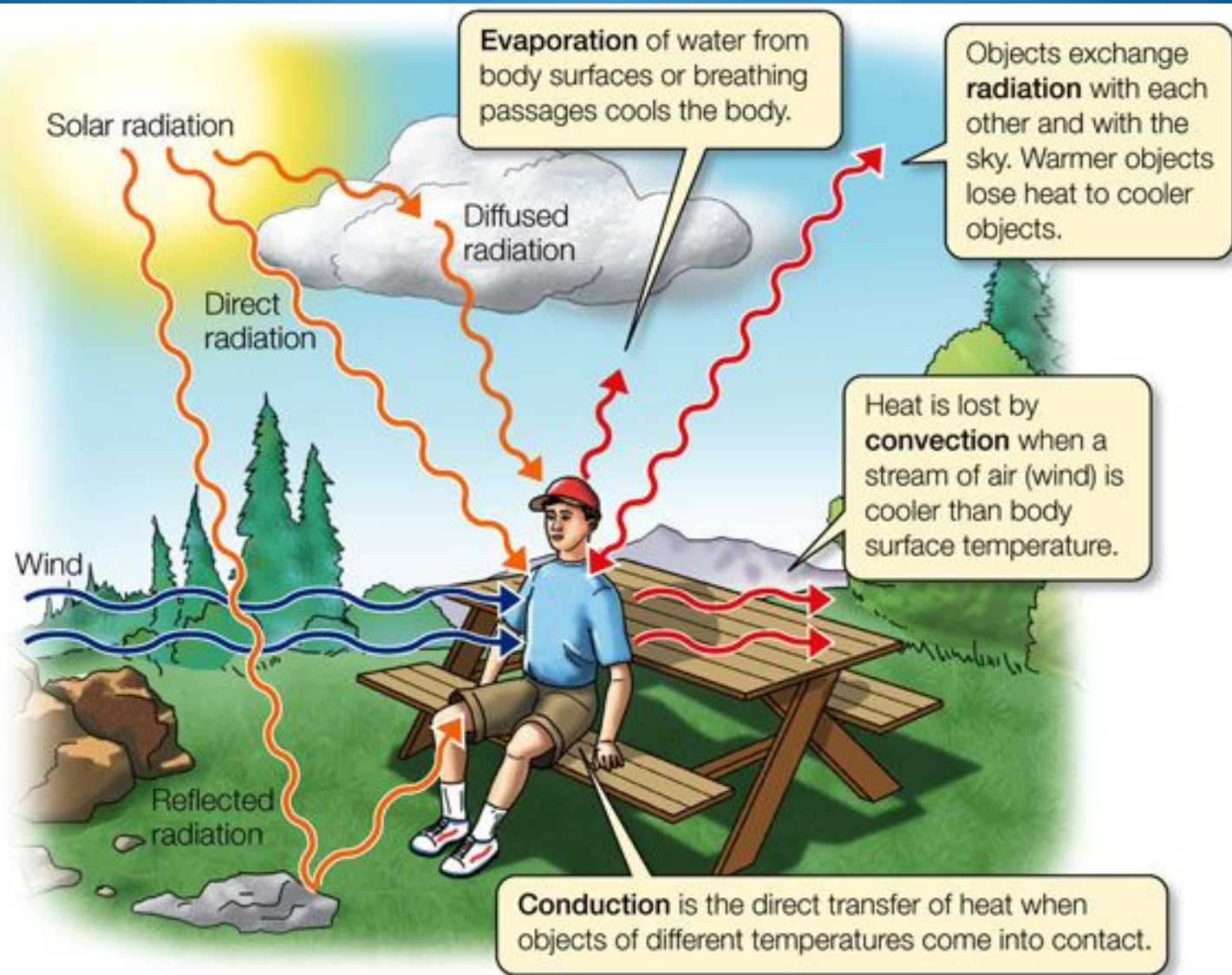
Segue to Heat Injury

NH Heat Injury: Who gets hurt?

Heat-related hospital visits (emergency dept.) by age group; Age-specific rate; Discharge year: 2013 - 2017; New Hampshire

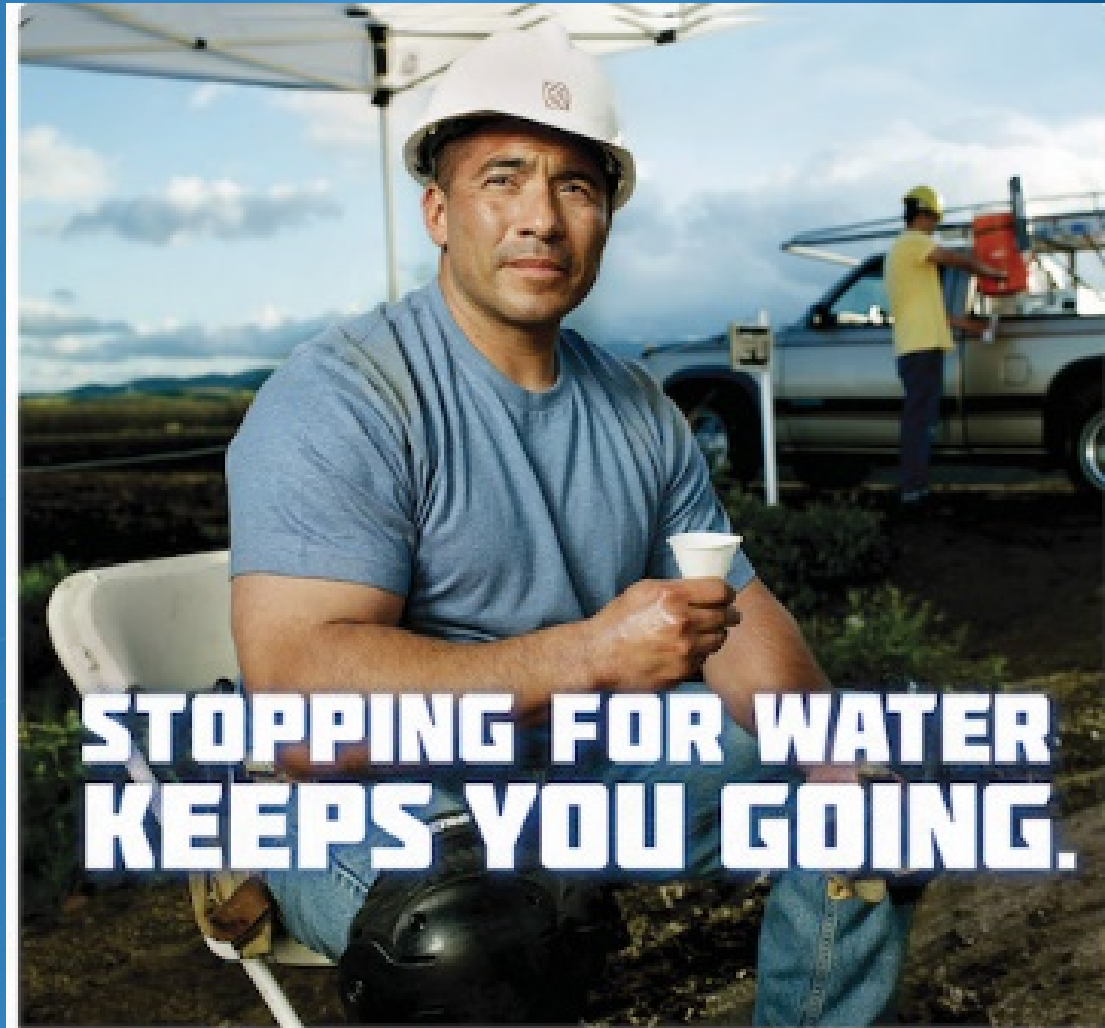


How the Body Gains & Loses Heat



Prevention of Heat Stress

- Shade
- Rest
- Hydration
- Clothing
- Adapt workload over days



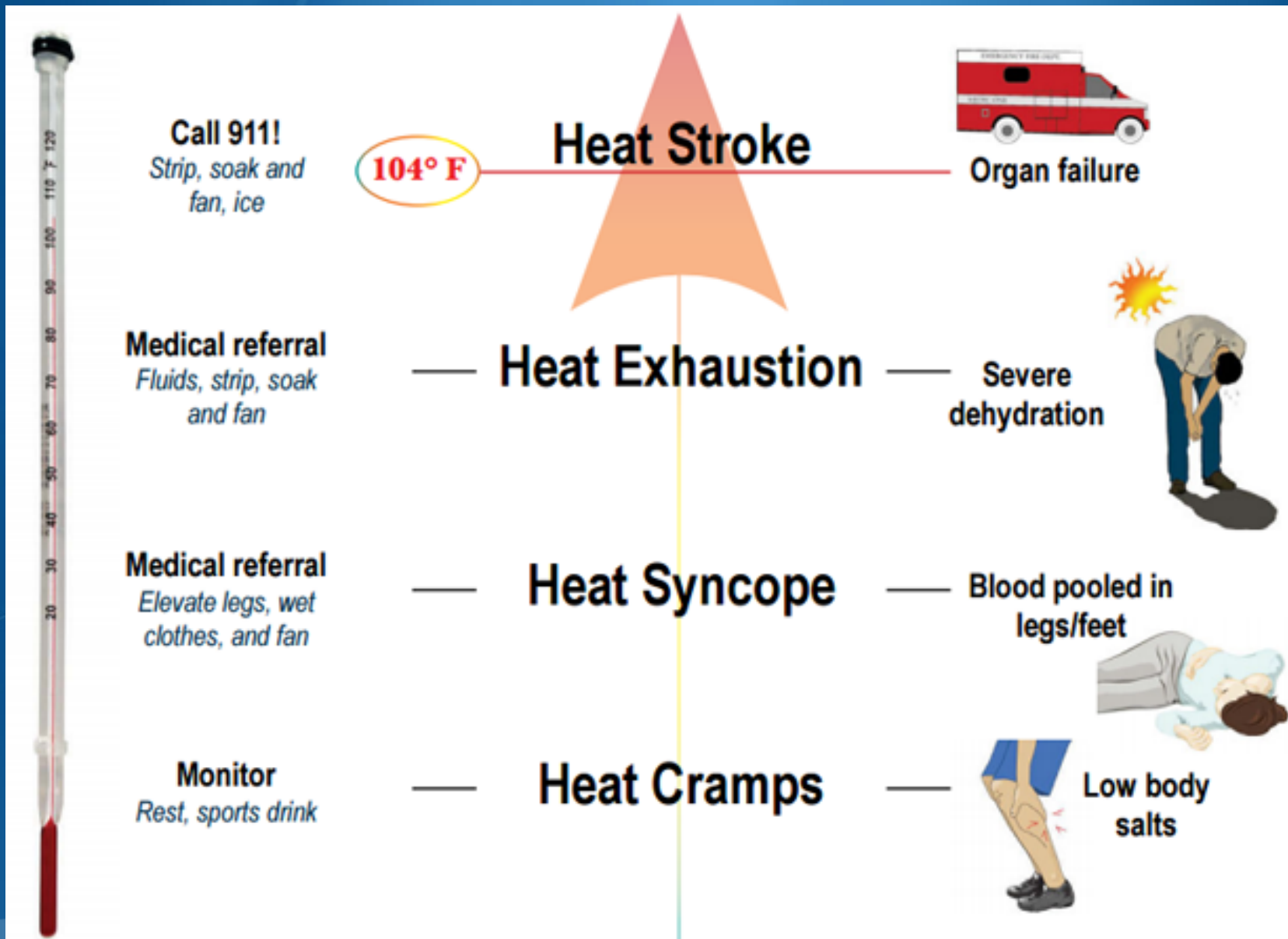
**WATER.
REST.
SHADE.**



OSHA
Occupational Safety
and Health Administration
www.osha.gov

1-800-321-OSHA (6742) TTY 1-877-889-5627

Treatment of Heat Stress & Injury



Treatment of Heat Exposure



Heat exposure can be dangerous

Signs of a medical emergency!



- Abnormal thinking or behavior
- Slurred speech
- Seizures
- Loss of consciousness

Take these actions

- 1** >> CALL 911 IMMEDIATELY
- 2** >> COOL THE WORKER RIGHT AWAY WITH WATER OR ICE
- 3** >> STAY WITH THE WORKER UNTIL HELP ARRIVES



Case Study: Lack of Heat Adaptation

Case Study: Hazards of Not Acclimatizing Workers

A 41-year-old construction worker was sawing boards in 93 °F heat. At 5 p.m., the worker collapsed in the parking lot. He was found by another employee. His body temperature was recorded at 108 °F when he was admitted to the hospital. He died the next day. At the time of the incident, the employee had been working for the company for one day. The company had no formal heat stress policy or acclimatization plan.

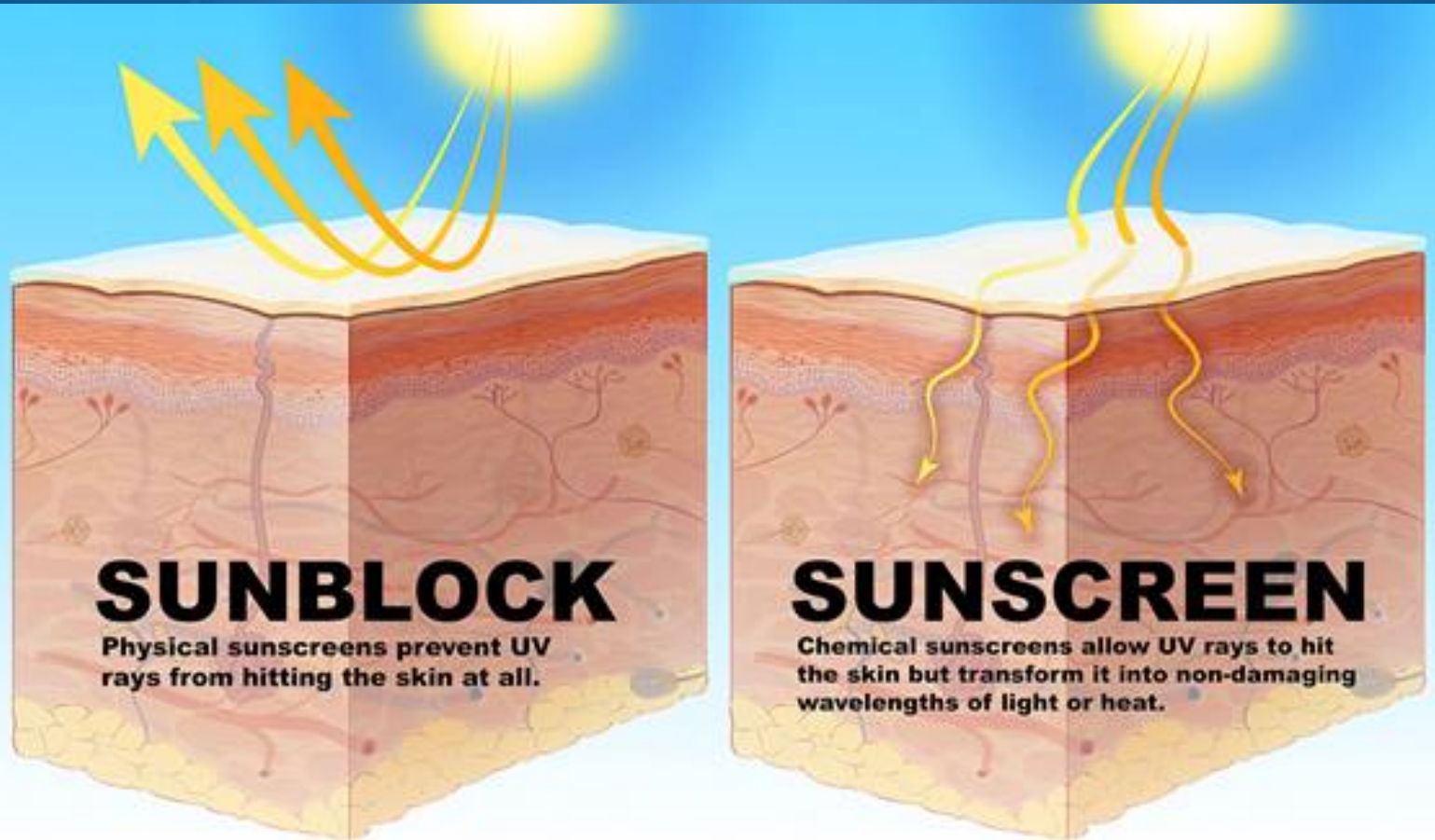
Lessons Learned

- Heat casualties often occur with new or less experienced employees.
- Deaths from heat stress often occur during the first few days on the job.
- Employers should have heat stress policies, and should implement acclimatization plans.



Sunscreen

- Full shade is the best sunscreen
- Most sunscreens expires after 3 years
- Two types of products: block or screen



Segue To Cold Conditions

NH Cold Injury Statistics, 2021-22

Seasonal Reports

These are emergency department visits reported through AHEDD searching for clinical language associated with heat/cold related injuries and exposure (hyper/hypothermia) and carbon monoxide exposure. The search tool has been validated with ICD-10 codes.

Encounter	Calendar Year	New Detections*	Year to date totals	Clusters
Heat Related				
	2022	0	0	
	2021	-	89	
Cold Related				
	2022	1	61	
	2021	-	115	
CO Exposure				
	2022	1	27	
	2021	-	23	

*New detections are for this reporting period.

How the Body Loses Heat

SWEATING:

Heat loss due to perspiration burns calories

WIND EXPOSURE:

Heat loss from wind cools the air next to skin



BREATHING:

Heat loss from cold air into lungs and warm air out

RADIATION:

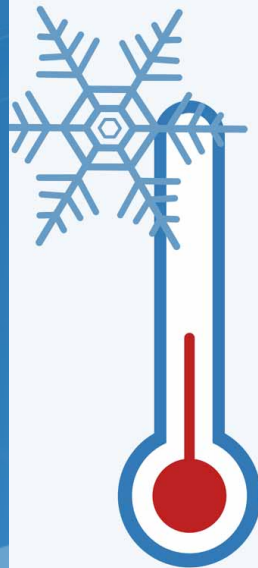
Heat loss from exposed skin not reflected back into body

TOUCHING OBJECTS:

Heat loss through contact with a tools or wet materials

Prevention of Cold Injury

- Rest
- Rewarm
- Rehydrate
- Adapt over time
- Stay Fit
- Stay Dry



What are the risk factors for cold stress?

OSHA has identified risk factors that can contribute to cold stress:

- Working in a wet or damp environment
- Wearing clothing that's not appropriate for the temperature
- Being out of shape (poor physical conditioning)
- Being physically exhausted
- Having a predisposing condition, such as hypertension, hypothyroidism or diabetes

Common Symptoms to Watch For

Warning Signs of Hypothermia



Confusion



Shivering



Difficulty
Speaking



Sleepiness



Stiff
Muscles

weather.gov/cold



Case Study: Work in a Freezer



Employee #1 was working in a negative 10 degree F freezer. Although he was wearing gloves, they did not provide adequate protection for his hands. The employee was hospitalized and had partial amputation of two fingers due to frostbite.

Types of Cold Injury

Injury/Illness	Cause
Low Core Temp (Hypo-thermia)	Occurs when core body temperature decreases to below 95°F
Deep tissue injury (or frostbite)	Ice crystal formation in skin cells, at or below freezing (32°F)
Shallow skin injury (or Frost-nip)	Ice crystal formation only in the very outer layer of the skin
Inflamed skin Injury (or Chilblains)	Mild cold injury due to prolonged exposure to temperatures above freezing (32°F to 60°F)
Immersion skin injury (or Trench foot)	Exposure of wet feet (or hands, other body areas) to cold temperatures above freezing (32°F to 50°F);

Chilblains



Foot health and skin care

Frostbite



Exposure to freezing conditions at or below <32

Trench Foot

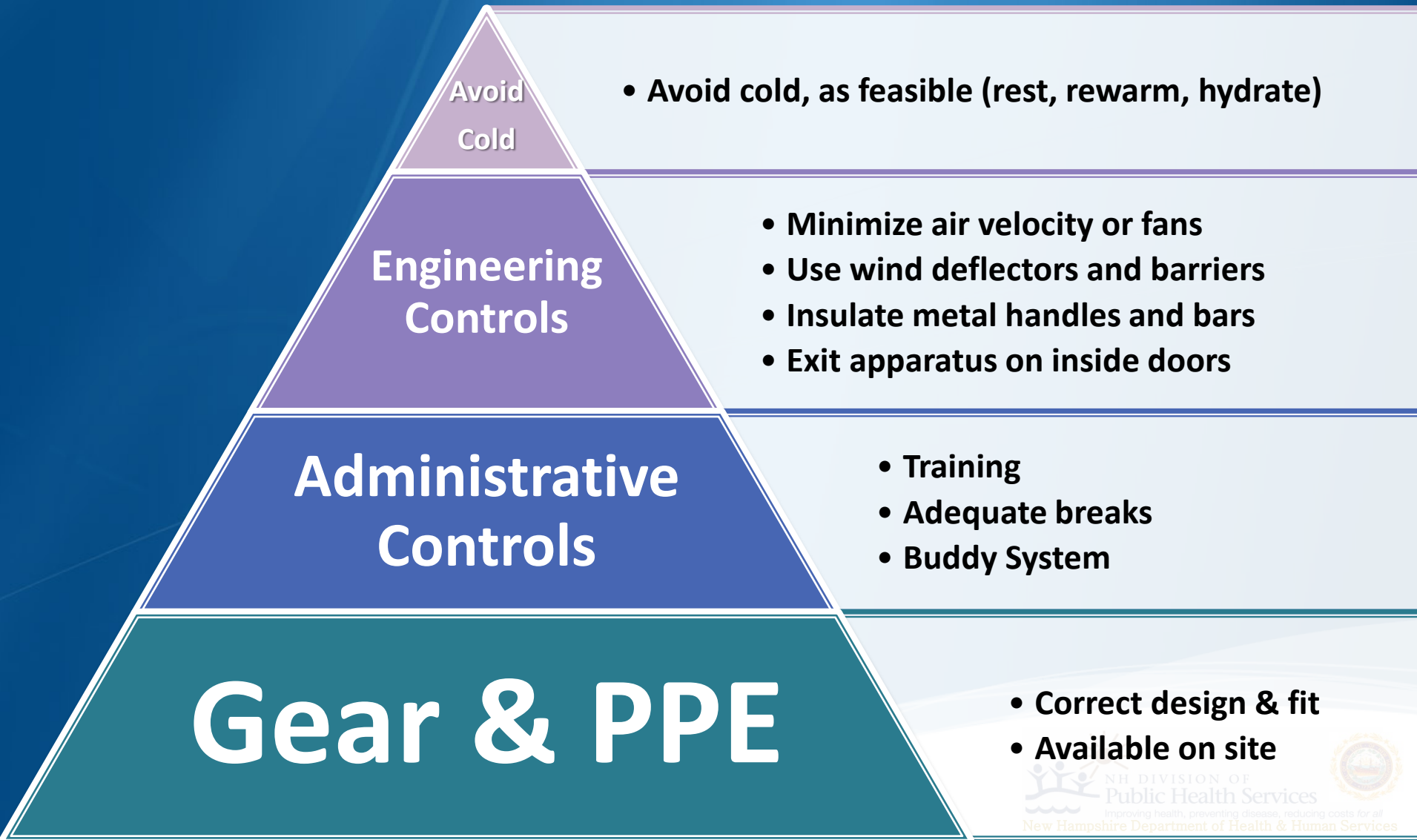


Can occur at temps. as high as 60F if feet are constantly wet

Risk Factors for Cold Injury

- Previous cold-related injury
- Poor physical conditioning
- Poor nutrition
- Alcohol use
- Certain health conditions or medications

Prevent or Manage workplace cold



Prepare: All Hazards Approach

- Three simple steps for all hazards
- Which is most important?



Segue to Legal Protections

US OSHA General Duty Clause

- OSH Act requires employers to comply with hazard-specific safety and health standards.
- Employers must provide their employees with a workplace “free from recognized hazards likely to cause death or serious physical harm...”
- Employers can’t substitute Emergency Preparedness Guides or H&S Plans for action on specific hazards
- Public Law 91-596, 12/29/1970

NH Dept of Labor – Safety Law

- LAB 602.01 Safety Programs. Most public sector worksites are required to have a written plan
 - Must include warning, first aid, training, reviews, and a joint loss management committee
- Lab 1403.43 Personal Protective Equipment. The employer shall ensure compliance with the following requirements:
 - (a) The employer shall assess the hazards and provide and require the use of ... PPE
 - (b) Where employees furnish their own PPE, the employer shall be responsible to, assure its adequacy and, to ensure that the equipment is properly maintained and in a sanitary condition;

Summary

- Working in extreme temperatures can result in mild or severe heat or cold injury
- Cold conditions can also lead to indirect injury, via slips, falls and accidents
- Temperature is important, although changes in wetness and wind speed can increase risk
- Know the symptoms & signs of cold injury
- Plan for the cold, and use workplace controls to find avoid cold injury

For more information:

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Or visit our website

www.dhhs.nh.gov/dphs/climate/



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