

Cold Stress



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Cold Stress

- Normal body temperature - 98.6 degrees Fahrenheit
- Cold stress occurs when body temperature drops to < 95 degrees Fahrenheit
- Cold stress is the effect on the body when core body temperature is reduced below the normal temperature.
- Body temperature below 95 can start to markedly affect a person.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUALTM

Body Heat Loss

- Respiration
- Evaporation
- Conduction
- Radiation
- Convection

We lose body heat through 5 means. When we breathe, we take in cold air and the body heats the air removing body heat. Warm body fluids (sweat) remove heat as they are expelled and evaporated. We lose heat if a person is in contact with a cold object. Heat is radiated to cold atmospheres through uncovered portions of the body. Wind will cause lose heat loss through convection.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUALTM

Hypothermia

- Cold kills in 2 distinct steps
 - Exposure
 - Cold
 - Wind
 - Exhaustion

Exposure to cold will begin to lower body temperatures. Temperature and wind are both factors which affect a person's ability to remain warm. Wind removes the warm layer of air surrounding a person. As a body begins to cool, the natural mechanism and instincts take over making an attempt to raise the body temperature. A large amount of energy is created and used in this effort. Energy use results in rapid exhaustion.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



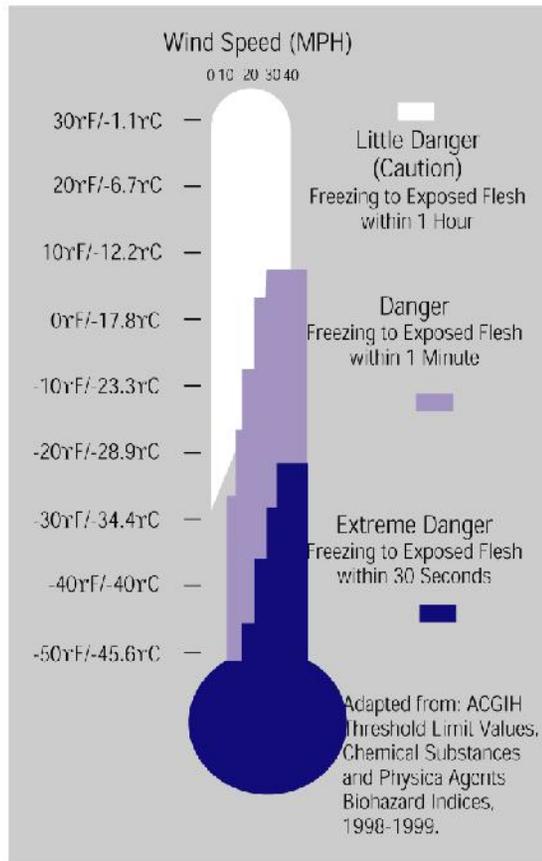
NEW MEXICO
MUTUAL[™]

THE COLD STRESS EQUATION

**LOW TEMPERATURE + WIND SPEED + WETNESS
= INJURIES & ILLNESS**

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result.

Hypothermia can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/ 37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



This cold equation chart is reproduced from Fed-OSHA material. It reflects the relationship between temperature and wind speed. This is commonly referred to as the “wind chill factor.” Although the actual temperature may be higher, wind reduces the apparent and perceived temperature to a person.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUALTM

Increased Risk

- Predisposing health conditions
 - Cardiovascular disease
 - Diabetes
 - Hypertension
- Medications
- Poor physical condition

Some people have health problems which predispose them to cold stress problems. Medications can interfere with the body's natural ability to create heat and to remain warm.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUALTM

Mild Hypothermia

- Body temperature 97 degrees Fahrenheit to 93 degrees Fahrenheit
- Shivering
- Alert
- Numbness in limbs, loss of dexterity, clumsiness
- Pain from cold

When a person's body begins to cool, the natural reaction is to begin to shiver. This is a natural response of muscle activity to create internal heat. As the body cools, surface blood vessels begin to shut down to prevent the further loss of heat through the skin. Numbness to the extremities occurs.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Moderate Hypothermia

- Body temperature 93 degrees Fahrenheit to 90 degrees Fahrenheit
- Same symptoms as mild hypothermia except: shivering may decrease or stop
- As the body cools, the ability to create heat through shivering is reduced

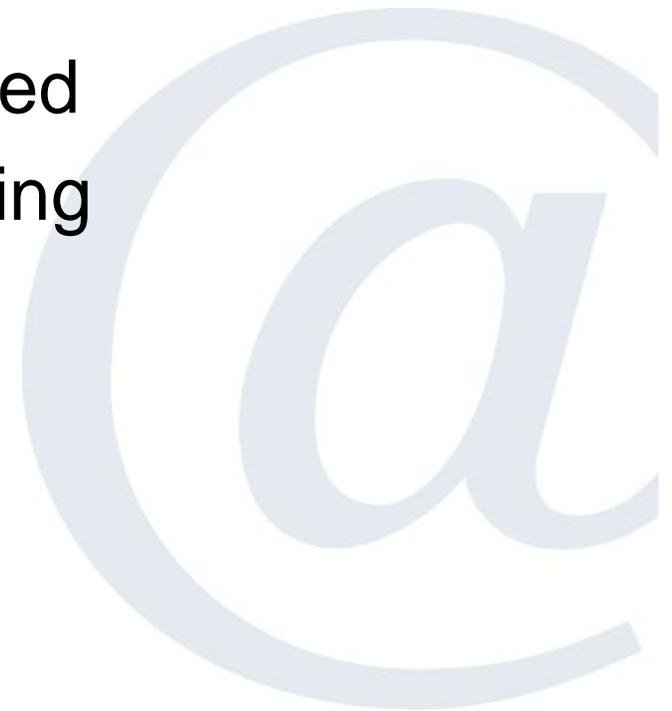
WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUALTM

Severe Hypothermia

- Body temperature 90 degrees Fahrenheit to 82 degrees Fahrenheit
- Shivering decreased or stopped
- Confusion and loss of reasoning
- Slurred speech
- Semi to unconscious
- Muscular rigidity



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Critical Hypothermia

- Body temperature < 82 degrees Fahrenheit
- Unconscious and may appear dead
- Little breathing
- Pulse slow
- Eyes dilated
- Body is rigid



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Mild Hypothermia - First Aid

- Prevent further heat loss
- Give warm, sweet liquids
- Apply gentle heat source
- Exercise to generate heat
- Keep head and neck covered



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Moderate Hypothermia – First Aid

- Same as mild but limit exercise
- Sips of warm liquids if victim fully conscious
- No alcohol
- Checked by MD



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Severe Hypothermia - First Aid

- Victim is in serious trouble
- Treat for shock
- Apply external heat source
- Avoid jarring victim
- No food or drink
- Transport gently to hospital

Victim may be in shock. Treat appropriately. Treat gently and avoid jarring. With reduced blood flows through the body, cardiovascular may develop through movement. For all heat stress conditions, a mild heat source should be applied to body areas with the largest blood flows. These include the groin area and neck.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Critical Hypothermia - First Aid

- Don't give up
- Handle with extreme care
- Tilt head to open airway
- CPR
- Stabilize temperature with external heat source
- Hospitalization



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Frostbite

- Freezing of deep layers of skin
- Pale, waxy-white skin color
- Skin becomes hard and numb
- Usually affects:
 - Fingers and hands
 - Toes and feet
 - Ears and nose



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Frostbite - First Aid

- Move victim to warm dry area
- Remove wet or tight clothing
- Do not rub affected areas
- Gently place affected area in warm water
- Seek medical attention



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Protection from Hypothermia

- Wear warm head covering
- Wear layered clothing
- Protect feet and hands
- Drink plenty of fluids
- Pace yourself during activities in the cold



Most body heat is lost through the head and feet. Make sure these are covered properly. Layered clothing consists of an outer garment which protects against wind and wetting. The garment close to the skin should wick sweat and fluids from the skin surface with an intermediate insulating material.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

How to Protect Workers

- Recognize conditions that lead to cold-induced injuries and illnesses
- Learn the signs and symptoms of cold-induced injuries and illnesses
- Train the workforce
- Select proper clothing and headwear
- Take frequent breaks in warm area

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

How to Protect Workers

- Perform work in warmer part of day
- Avoid exhaustion and fatigue
- Use the buddy system
- Drink warm beverages. Avoid those with caffeine
- Eat warm, high calorie foods



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Hypothermia in Water

- Body heat loss is 25 times faster in water than in cold air
- Swimming increases heat loss by 35%
- H. E. L. P. reduces heat loss
- Huddle extends survival time by 50%

It takes a tremendous amount of energy to heat water. If making contact with wet objects or in the water, the body will lose heat attempting to heat the water. Swimming is like the wind in that the warm layer of water near the body is being constantly moved and replaced with cold water.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUALTM

Water Immersion Survival

Water Temperature	Exhaustion	Survival Time
32.5	15 min	15 min to 45 min
32.5 - 40	15 to 30 min	30 min to 90 min
40 to 50	30 min to 1 hr	1 hr to 3 hrs
50 to 60	1 hr to 2 hrs	1 hr to 6 hrs
60 to 70	2 hrs to 7 hrs	2 hrs to 40 hrs
70 to 80	3 hrs to 12 hrs	3 hrs to indefinite
Over 80	Indefinite	Indefinite

Chart indicates survival in water. Water temperature of about 80 degrees, survival is indefinite. This shows that at 80 degrees, the body produces enough heat to maintain the body temperature as survivable.

WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUALTM

H. E. L. P.

- Heat Escape Lessening Posture
 - Maintains a layer of body heated warm water near the body



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Huddle

- Extends survival time by 50% over swimming or treading water
 - Keeps warm water near bodies and uses multiple sources for warmth



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.



NEW MEXICO
MUTUAL[™]

Risk & Safety Management Contact

If you have any questions or would like Risk and Safety assistance with your policy, please contact us:

Albuquerque area: (505) 345-7260

Toll Free: (800) 788-8851

P.O. Box 27825

Albuquerque, NM 87125

You can also email us at NMMSafetyAdvisor@NewMexicoMutual.com



WORK SAFE. WORK SMART. MAKE SAFETY HAPPEN.

