

Guide to
Prevention of Heat Stress
At Work



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Prevention of Heat Stress at Work

On Prince Edward Island illness from excess heat is a risk primarily on summer days with high temperatures combined with high humidity. Workers who are working outside during these conditions are at risk.

Workers inside in hot environments such as kitchens, boiler plants, or around hot equipment or processes can also be at risk. This risk is elevated when the normal cooling effect of outside air is not available.

Factors in Heat Stress

There are many factors that contribute to the risk of heat stress. They include:

Environmental Factors

- Air temperature
- Humidity
- Air flow (ventilation or wind)
- Radiant heat from sun or equipment such as ovens or boilers.

Individual Worker Factors

- Hydration (water consumption)
- Clothing
- Medical conditions and medications
- Acclimatization
- Fitness level

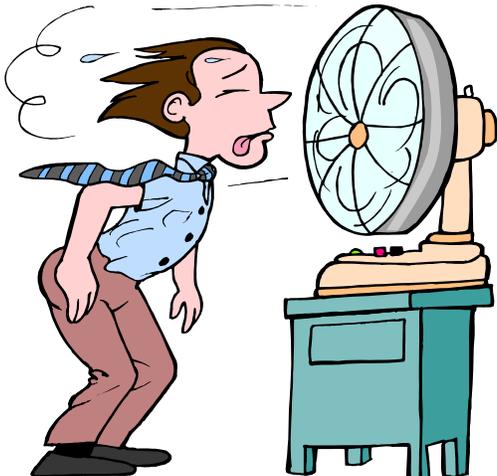
Work

- How heavy the work is
- How fast and how long it must be done



How Your Body Controls Heat

Heat is produced in our bodies from normal activities like breathing, the digestion of food and working muscles.



The harder we work the more heat we generate. Our bodies get rid of heat by increasing blood flow in the blood vessels close to the skin and by sweating. It is actually the evaporation of sweat that cools our skin. In hot conditions workers need to be able to sweat more and have the sweat evaporate.

Help your body cope with heat by drinking lots of fluids, getting enough salt and using ventilation to help evaporate sweat.

Plan to Control Heat Stress



When workers are exposed to a hazard from heat, the employer must have a plan to prevent illness from the exposure.

Engineering controls should be the first action. These would include:

- Insulating or shielding hot surfaces to reduce radiant heat.
- Providing air conditioning or ventilation to remove hot air or reduce humidity.
- Eliminating heavy work or having it done at a time or place where the heat hazard will not exist.

Administrative controls are most common with outdoor work in summer. Assess the work for where and when heat will be a hazard. Develop a plan to eliminate or control each hazard.

- Acclimatize workers to the heat. Acclimatized workers will sweat more and eliminate less salt in their sweat and are able to withstand greater heat. This can take a week or more of gradual exposure to the heat. Acclimatization needs to be taken into account even after a three day weekend.
- Supervise work. Create a buddy system and train workers to watch for the first symptoms of heat stress. Always set up a check-in procedure if a worker is alone when heat is a hazard.



- Provide water and encourage workers to drink it. A glass every 20 minutes is recommended while working. Warn workers not to wait until they are thirsty.
- Salt tablets are not recommended because they take a long time to enter the system. Salted food or drinks containing electrolytes are a better choice. Avoid caffeinated or alcoholic beverages because they can contribute to dehydration.
- There are recommendations for work rest cycles in different conditions and types of heat. These can be reviewed at the Canadian Center for Occupational Health and Safety site at www.ccohs.ca.

- Plan to adjust work/rest schedules according to broadcast humidex or temperature ratings. Plan heavy or outdoor work for early or late in the day.
- If personal protective equipment is required, ensure any heat retention caused by it is taken into consideration when planning the work.



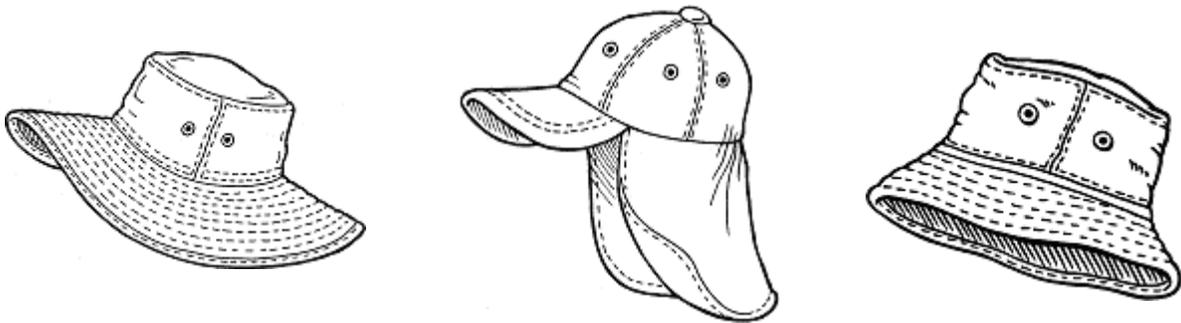
Sun Safety Guidelines

Skin cancer is the most common cancer in Canada, accounting for about one third of all newly diagnosed cancers. PEI has one of the highest skin cancer rates in Canada. The most effective prevention is to avoid prolonged exposure to the UV rays of the sun. Outdoor workers have a higher risk because the damage caused by the ultra violet rays accumulates over time.

These sun safety guidelines have been developed with the assistance of the Canadian Cancer Society.

- Schedule work to be done in the shade or cool times of the day where possible. As much as possible, stay out of the sun between 11AM and 4PM. Ensure breaks are taken out of the sun. Set up a temporary shade shelter if shade or an air conditioned space is not available. Consider using an umbrella if that is practical.
- Wear loose fitting, tightly woven clothing that covers arms and legs. The body cools itself through evaporation. On skin exposed to the sun, evaporation can happen so quickly the sweat does not do its job. Clothing that is tightly woven provides good protection from the UV rays of the sun.
- Sunscreen of at least a SPF 15 should be used on all exposed skin. If you are light skinned, a higher SPF is recommended. Research from the BC Center for Disease Control shows that most people do not apply enough sunscreen and this limits its protection. They recommend 30 mls or a little less than ¼ cup for the whole body. Clothing is a better option for limbs because the sunscreen can wear off and may interfere with the body's ability to sweat.
- The Canadian Cancer Society recommends using sunscreen along with shade, clothing and hats, not instead of them.
- Ensure outside workers have good sunglasses that filter out UVA and UVB wavelengths. They should comply with CSA Standard Z94.5-95. Close fitting, wrap-around styles prevent UV rays from entering through the sides and top of sunglasses. Choose sunglasses with even shading, medium to dark lenses with grey, brown or green tint.

- Wear a hat with a tight weave and a three inch brim all around. Common areas for skin cancer are the face and neck. Look for:
 - A style that shades the face, neck and ears.
 - Closely woven weave material. If you can see through the hat material, the UV rays will also get through!
 - Hats that do not obscure vision or pose a safety concern.
 - Good ventilation, especially if you are doing physically demanding work.



Legislated Requirements Concerning Heat Hazards

On Prince Edward Island, Occupational Health and Safety Regulation 42.1, Extremes of Temperature, references the Threshold Limit Values (TLV's) laid down by the American Conference of Governmental Industrial Hygienists. These can be found in *TLV's for Chemical Substances and Physical Agents 2006* from www.acgih.org. The many factors contributing to heat stress make setting a specific temperature difficult. Often working in the heat is uncomfortable but the point at which it becomes a health hazard is harder to define.

Where there is a risk of injury or illness from heat, the employer is required to take every reasonable precaution to ensure worker safety. This means developing a plan to minimize the risk, writing procedures, providing equipment and training workers in preventative measures.

More detailed information can be found at:

The Canadian Center for Occupational Health and Safety: www.ccohs.ca

The British Columbia Safe Work site under publications, heat stress at: www.worksafebc.com

The BC Center for Disease Control at www.bccdc.org

The Canadian Cancer society at <http://www.cancer.ca/ccs>



Heat Related Disorders

| Hazard | Signs and Symptoms | Treatment | Prevention |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Sunburn</u></p> | <p>Hot, red, painful skin blisters</p> | <p>Cool the skin with water and or lotions</p> | <ul style="list-style-type: none"> ➤ Cover skin with tightly woven loose fitting clothing ➤ Use sunscreen at least every two hours ➤ Stay in the shade ➤ Remember your eyes need protection too, wear sunglasses with UV protection |
| <p><u>Heat rash</u></p> <p>Caused by humid conditions where skin stays wet</p> | <p>Itchy, red rash</p> | <p>Ointment Rinse skin with cool water</p> | <ul style="list-style-type: none"> ➤ Keep skin dry and clean ➤ Wear loose clothing |
| <p><u>Heat Cramps</u></p> <p>Caused by losing too much salt. The cramps often occur late in the day or into the evening after the muscles have cooled.</p> | <ul style="list-style-type: none"> ➤ Pain in muscles, often the ones that have been working ➤ Excessive sweating ➤ Hot, moist skin ➤ Normal or slightly high temperature | <ul style="list-style-type: none"> ➤ Move to a cool place ➤ Cool with sponge, water and fan ➤ If worker is alert offer fluids, juice, oral rehydrating solutions or 1 teaspoon of salt dissolved in a half liter of water | <ul style="list-style-type: none"> ➤ Stay well hydrated ➤ Drink fluids that have salt in them ➤ Put salt on food (unless there is a salt restriction) ➤ Salt tablets are not recommended ➤ Avoid caffeine and alcoholic beverages ➤ Schedule heavy work in coolest part of the day or on cooler days ➤ Take frequent breaks in the shade or an air conditioned space ➤ Rotate heavy jobs |

| Hazard | Signs and Symptoms | Treatment | Prevention |
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| <p><u>Heat Exhaustion</u></p> <p>This condition is particularly dangerous to workers with heart conditions or breathing problems. It is caused by the depletion of water and salt.</p> | <ul style="list-style-type: none"> ➤ Sweating ➤ Cool, pale, clammy skin ➤ Shallow breathing ➤ Weak rapid pulse ➤ Headache ➤ Nausea ➤ Confusion ➤ Fatigue, weakness ➤ Loss of co-ordination ➤ Muscle cramps ➤ Temperature over 38C | <ul style="list-style-type: none"> ➤ Get medical aid as this can progress to a serious illness ➤ Remove worker to a cool location ➤ Sponge with cool water and fan unless worker starts to shiver ➤ If alert and not nauseated give fluids; juice, rehydrating drinks or salt with water | <ul style="list-style-type: none"> ➤ As for heat cramps and; ➤ Workers with heat exhaustion usually recover quickly but they should rest and restore fluids for the remainder of the day ➤ Use a buddy system ➤ Ensure workers are trained to recognize symptoms |
| <p><u>Heat Stroke</u></p> <p>A life threatening condition It can happen very quickly or be preceded by heat exhaustion</p>  | <ul style="list-style-type: none"> ➤ No sweating ➤ Hot, dry, flushed skin ➤ Confusion, agitation ➤ Headache, nausea and vomiting ➤ Seizures ➤ Increased respiratory rate ➤ Irregular fast pulse ➤ Temperature 41C or higher ➤ Shock ➤ Cardiac arrest | <ul style="list-style-type: none"> ➤ Call for emergency medical aid ➤ Move the worker to a cool location ➤ Activate emergency CPR if necessary ➤ Cool the worker's body with water or wet sheets, fanning ➤ If the worker is alert and not nauseated give fluids as above | <ul style="list-style-type: none"> ➤ As for heat exhaustion and; ➤ Training in early signs and symptoms ➤ Use of a buddy system to be aware of early symptoms in co-workers ➤ Supervision of all workers at risk |