



Occupational Health  
Clinics for Ontario  
Workers Inc.



# Hazards of Working in the Sun

## Table of Contents

|  |           |
|--|-----------|
| <b>Why be sun smart? .....</b>   | <b>1</b>  |
| <b>How do I protect myself? .....</b>                                    | <b>1</b>  |
| <b>Sunglasses .....</b>  | <b>1</b>  |
| <b>Ultraviolet Radiation .....</b>                                       | <b>2</b>  |
| <b>Photosensitizing Drugs &amp; Conditions.....</b>                      | <b>3</b>  |
| <b>Sunburn .....</b>   | <b>3</b>  |
| <b>How does sunscreen work?.....</b>                                     | <b>3</b>  |
| <b>What is the difference between sunblock and<br/>sunscreen ? .....</b> | <b>4</b>  |
| <b>Tips for applying sunscreen/sunblock .....</b>                        | <b>4</b>  |
| <b>Deet and Sunscreen/Sunblock .....</b>                                 | <b>5</b>  |
| <b>What is PABA? .....</b>   | <b>5</b>  |
| <b>What your wearing can influence your exposure!!!... </b>              | <b>5</b>  |
| <b>Dehydration .....</b>   | <b>5</b>  |
| <b>Skin Cancer .....</b>   | <b>7</b>  |
| <b>Heat Disorders.....</b>   | <b>8</b>  |
| <b>Heat Illness Prevention Strategies .....</b>                          | <b>11</b> |
| <b>References .....</b>  | <b>13</b> |

## Why be sun smart?

Ultraviolet (UV) radiation, which has a shorter wavelength than either visible blue or violet light, is responsible for sunburn and other adverse health effects including. Most outdoor workers work when ultraviolet radiation or 'UV' is at its peak (between 10am and 4pm).



**Tip:** If your shadow is shorter than you are, the sun's rays are at their peak and you are at risk to burn!

Being sun smart has many advantages

- Protects health
- Improves safety
- Increases productivity
- Educates employees on early detection
- Decreases injury & sick time
- Shows you care about employee and their families



Employers and workers can work together to minimize sun exposure and introduce protection strategies to reduce the chances of employees suffering from sun burn and heat related illnesses.

## How do I protect myself?



### Sunglasses

Many scientific studies indicate that prolonged sun exposure can damage your eyes and lead to cataracts, damage to your retinas and growths on your eye (including cancer). It is therefore recommended that you wear 95% and above UV-absorbent sunglasses and a wide brim hat when you are exposed to the sun for long periods of time.

Things to consider when choosing sunglasses:

- Look for sunglasses that block 95-100% of all UV light.
- The color and degree of darkness of a lens TELLS YOU NOTHING ABOUT THE LENSES UV PROTECTION.  
Be sure and check!
- Mirror finishes do not fully protect against UV rays. Transition lenses may not be appropriate for working.



### **Did you know...?**

If you see a label that says “UV absorption up to 400 nm” this means the same as “100% UV absorption”.

No lens is truly unbreakable, but plastic lenses are less likely to shatter when hit by an object (ball, stone etc.)

Polarized lenses work to cut reflective glare from surfaces such as pavement, water, and or snow. These types of lenses will be particularly useful for driving, fishing etc. Studies have shown that enough UV rays enter around normal frames to damage the eye. In order to protect your eyes choose a wrap around style or those with side shields to protect your eyes from all angles.

### **Ultraviolet Radiation**

There are two types of harmful rays, UVA and UVB rays. Together, these rays are the primary cause of sunburn and skin cancer.

Exposure to UVA and UVB rays can suppress the immune system.

*Since your skin is your first line of defense, help protect yourself by applying sunscreen and wearing protective apparel every time you go outside!*

## Photosensitizing Drugs & Conditions

There are certain drugs that make your skin and eyes more sensitive to light or make you more susceptible to harm from the sun/heat. These include:

|                   |                           |
|-------------------|---------------------------|
| Some pain killers | Diuretics (“water pills”) |
| Antibiotics       | Blood pressure meds       |
| Antihistamines    | Some herbal remedies      |

There are also certain diseases, like lupus that can make you more sensitive to the sun.

It is your responsibility to check with your doctor and pharmacist!!

## Sunburn

### What it looks like

Red, painful, or blistering and peeling skin

### How do I treat it?

- If the skin blisters, seek medical aid
- Use skin lotions (avoid anesthetics and products that end in “caine”) and work in shade if possible
- Aspirin may be taken orally to alleviate discomfort and decrease inflammation.



### How does sunscreen work?

Sunscreen works by blocking or absorbing ultraviolet light. All sunscreens have an SPF factor or *Sun Protection Factor*. This acts as a multiplying factor. For example if you would normally be okay in the sun for 10 minutes without burning/causing damage and you apply an SPF 10, you would be okay in the sun for 100 minutes.

\*\* When this time runs out you are no longer protected regardless of whether you continue to reapply.

\*\* Important! Sunscreens have expiration dates. An expired product will not offer proper SPF protection

## What is the difference between sunblock and sunscreen ?



- Sunblock is different than sunscreen.
- A sunblock will scatter and reflect as well as physically block UV radiation. (zinc oxide)
- A sunscreen will absorb the UV rays and prevent penetration through the skin.
- Both offer adequate protection from the sun's harmful UV rays!

## Tips for applying sunscreen/sunblock

Regardless of skin type, a broad spectrum sunscreen with an SPF of at least 15 should be used year round.

If you know you will be working in the sun for extended hours, apply a sunscreen with an SPF of 30 or greater as higher SPF factors protect for a longer period of time.

Apply sunscreen even on cloudy days as 80% of the sun's harmful UV rays pass through the clouds.

Sunscreen should be applied to dry skin 15-30 minutes BEFORE going outdoors.

•Apply sunscreen liberally. One ounce (enough to fill a shot glass) of sunscreen is considered the amount needed to cover the exposed areas.

Areas of particular attention are the face especially the nose and lips, ears, hands, behind the knee, back of the neck,

hands, feet and arms as these are considered high risk areas and are most often exposed.

Sunscreen should be applied every 2 hours or after perspiring heavily since sunscreens rub and wash off

## **Deet and Sunscreen/Sunblock**

It is safe to use DEET and sunscreen simultaneously to avoid insects when outdoors. However, sunscreens containing DEET should *NOT* be applied. Instead, apply your sunscreen *FIRST* followed by a repellent containing DEET.



## **What is PABA?**

- PABA (Para-amino benzoic acid) is an ingredient (dye) that is found in most sunscreens that absorbs ultraviolet light.
- PABA allergies are due to its acidic nature. Those who have sensitive skin should use a PABA-free sunscreen.

## **What your wearing can influence your exposure!!!**

Most clothing absorbs or reflects UV rays. White fabric, like loose-knit cotton or wet clothes does not offer much protection. An average white cotton t-shirt offers and SPF between 3 and 9. Clothing that has a tight weave is best at protecting your skin from the sun. There is also clothing that you can buy from most outdoor stores that is specially treated for sun protection.

## **Dehydration**

Heavy and prolonged sweating causes the loss of water and electrolytes from the body. A loss of only 1% of total body water can alter the body's ability to stay cool. With heavy

sweating or prolonged sweating you also lose electrolytes, particularly sodium. This can seriously threaten the ability of the myocardium (muscle of your heart) to maintain its rhythm. It can also affect your GI tract and skeletal muscles.

**DO NOT RELY ON THIRST!!!**



Thirst is not usually sensed until dehydration is already established. Even people well experienced with heat strain often fail to drink enough water to regain full hydration.

### **How do I know if I am dehydrated?**

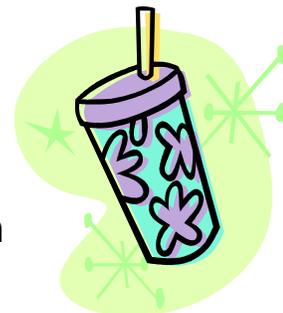
- Checking the color of your urine is a fast and simple way of assessing hydration status.
- Pale yellow urine *usually* indicates adequate hydration
- Dark yellow urine *can* indicate a certain level of dehydration.
- How often you have to urinate may also indicate one's hydration status.

### **So what should I drink?**



Try and drink small amounts of water often. This will be more effective in keeping you hydrated as opposed to drinking large amounts of water infrequently.

Workers working in very hot environments for long periods of time may consider drinking a fluid containing electrolytes to replace those lost, like a sports drink, or very lightly salted water (1/4 teaspoon to a quart of water). You may also consider very lightly salting your food.



## Skin Cancer

People who work outdoors are in one of the highest risk groups for skin cancer. They are more likely to develop skin cancer as a result of long term exposure to (UV) radiation from the sun's rays.

Make sure you do regular skin checks:

- Normal Moles are round or oval and have an even color.
- Atypical Moles are usually a mix of browns, have a smudged border, and are often bigger than 5mm. You have an increased risk of Melanoma with these types of moles.
- Melanoma is the most serious kind of skin cancer. Can spread quickly to other parts of your body and can be fatal, but curable if caught early enough.
- Non-Melanoma Skin Cancer is rarely fatal but needs to be taken seriously so they don't spread and cause other health problems.
- Basal Cell Carcinomas are tumors of the skin that can appear as small fleshy bumps. They don't grow quickly and rarely spread but can cause local damage. If left untreated may discharge pus or bleed.
- Squamous Cell Carcinomas are tumors that may appear as nodules or red scaly patches. Common in fair skinned people. Can develop into large masses and can spread to other parts of the body.
- Watch for raised red or pink scaly nodules or wart like growths that have pus in the center. May develop on the edge of the ears, face, lips, mouth, hands and other exposed parts of the body.
- Actinic Keratoses are sun-induced skin growths. These are pre-malignant. Look for raised, reddish, rough textured growths.

## Heat Disorders

Heat can lead to accidents from slipperiness of sweaty palms, fogged glasses, sweat in eyes, dizziness & fainting, and accidental contact with hot surfaces. It can also seriously affect your health and damage your body.

### Heat Rash

*Symptoms of heat rash include:*

- Red blotchy skin
- Extreme itchiness in areas persistently damp with sweat

*Treatment:*

- Staying in a cool environment, taking a cool shower and making sure to dry off thoroughly.
- Wear loose and breathable clothing
- Keep skin clean and pores unclogged

### Heat Cramps

Heat cramps are always a dangerous sign because they can occur alone or with other major heat disorders. They can be caused by sweating heavily and replacing water but not salt.

*Symptoms of heat cramps are:*

- Painful cramps of leg, arm or abdominal muscles
- Hot moist skin

*Treatment includes:*

- Moving to a cool area to rest
- Drink fluids
- Massage cramped area
- Loosen clothing

### Heat Exhaustion

This occurs from loss of body fluids and minerals. If you have heat exhaustion and heat cramps, it is possible to go into a state of heat stroke.

*Symptoms include:*

- Headache, thirst, heavy sweating, nausea, dizziness, fatigue, restlessness, impaired judgement, loss of appetite, weak and rapid pulse, cool moist skin, low to normal blood pressure, blurred vision, may lead to coma or death!

*Treatment*

- Get medical aid
- Move to shaded area, or air conditioned place
- Rest, or lay down
- Loosen clothing
- Drink water
- Administer cool fluid

**Heat Stress**

Heat stress is the combination of heat that the worker is exposed to, the metabolic demands of the individual, environmental factors (i.e. air temperature, humidity, air movement, and radiant heat exchange) and clothing requirements.

**Heat Stroke**

*Heat Stroke* occurs when the body's ability to cool itself (thermoregulation) has become overwhelmed, and the body has lost its major defenses against hyperthermia

*Heat stroke is characterized by the following symptoms:*

- Elevated body temperature of 40.5° C (105°F)
- Hot, dry skin because sweating has stopped
- Dizziness
- Confusion
- Rapid breathing
- Weak pulse
- Person is confused, semiconscious or unconscious.

### *Treatment*

- Seek medical attention immediately
- Remove employee to cooler location, out of the sun
- Loosen or remove clothing
- Cool with water or wet sheets and fan for quick evaporation
- Use cold compresses (head & neck, armpits & groin)



### ***To help avoid heat stroke...***

- Perform the heaviest work during the coolest part of the day.
- Avoid eating large meals before working in hot environments
- Avoid alcohol or beverages with caffeine. These make the body lose water and increase the risk of heat illness.

**IF HEAT STROKE IS NOT TREATED IMMEDIATELY  
PERMANENT DAMAGE TO ORGANS OR EVEN DEATH  
CAN OCCUR!!!**

### **Who Is At Risk?**

#### Personal Risk Factors

- Being Overweight
- Poor physical condition
- Previous heat illness
- Age (especially elderly)
- Diabetics
- Heart disease or high blood pressure
- Recent illness
- Alcohol consumption
- Medication
- Having difficulty getting used to temperature changes

## Heat Illness Prevention Strategies

- Provide periodic rest breaks for the employees
- Provide frequent fluid intake
- Rotation of workers
- Clothing
- Hats
- Sunglasses
- Sunscreen (SPF 30 +)
- Shaded areas
- Use of mechanical aids to perform work instead of relying on physical effort
- Train supervisors and employees to
  - identify symptoms of heat disorders and the appropriate prevention measures
  - Properly apply protective equipment

## Management/Supervisor Responsibilities

- Ensure employees who are working in hot environments take necessary precautions
- Implement a written sun safety policy
- Monitoring signs and symptoms of heat disorders in employees
- Ensure the employees are following the guidelines of the policy
- Adjust work practices as necessary when employees complain of heat stress
- Monitor the workplace to determine when hot conditions arise
- Determine whether workers are drinking enough water and ensure that it is available
- Determine a proper work/rest regimen
- Arrange first-aid training for workers

## **Workers Responsibilities**

- Following instructions and training for controlling heat stress
- Being alert to symptoms in yourself and others
- Avoiding consumption of alcohol, illegal drugs, and excessive caffeine
- Finding out whether any prescription medications you're required to take can increase heat stress
- Getting adequate rest and sleep
- Drinking small amounts of water regularly to maintain fluid levels and avoid dehydration

**It is everyone's responsibility to protect themselves from the hazards of working in the sun. All parties should work together to promote a safe work environment.**



## References

American Academy of Dermatologist

<http://www.aad.org/SkinCareNews/SafeSunTips/sunscreenfacts.html>

American Academy of Dermatology: Public Resources

<http://www.aad.org/pamphlets/sunscreen.html>

American Academy of Ophthalmology medical library

Child and Family Canada-Sun Safety

<http://www.cfc-efc.ca/docs/cansc/00000621.html>.

American Association of Dermatology.

<http://www.aad.org/pamphlets/SunSkin.html>

American Conference of Governmental Industrial Hygienists (1998). Heat Stress and Strain.

Canadian Cancer Society Massey, R. (2004). *Sunscreen science, carcinogenic solar radiation and pharmacology of sunscreens*. Sun Safety for Kids.

<http://www.sunafetyforkids.org/sunscrsci.html>

<http://www2.lifespan.org/Services/Dermatology/SkinCare/sunscreen.html>

Cancer Research Center- Sun Safe Worksite

[http://www.amc.org/h\\_info\\_sunafety.html](http://www.amc.org/h_info_sunafety.html)

Center for Disease Control (2002)

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5104a3.html>

Clapp, A.J. et al.(2002). A review of fluid replacement for workers in hot jobs. *Journal of American Industrial Hygiene Association*, 63, 197-198.

Coppertone: Get Smart About The Sun.

<http://www.coppertone.com/edu.aspx?sunsafeid=4>

Discovery Health Website

<http://www.discoveryhealth.co.uk/encyclopedia>

Everybody- New Zealand Consumer Health Information-  
Sunglasses

[http://www.everybody.co.nz/docsq\\_w/sunglass.htm](http://www.everybody.co.nz/docsq_w/sunglass.htm)

Facts about sunscreen and its use

[http://www.skincancer.dermis.net/content/e03prevention/e43/index\\_eng.html](http://www.skincancer.dermis.net/content/e03prevention/e43/index_eng.html)

Health Care Health and Safety Association of Ontario.  
(2003)- *The safe angle* 5(1),

How sunscreens work

<http://www.travel.howstuffworks.com/sunscreen4.html>

North American Occupational Health & Safety Week.

(2004) <http://www.naosh.org/english/documents/sun.html>

Sun Protective Clothing

<http://www.sunprotectiveclothing.com>

Sunscreen and Sun protective clothing (Federal Trade  
Commission)

<http://www.ftc.gov/bcp/online/pubs/health/sun.htm>.

Sunscreens-PABA free, why is this important?

[http://www.skinsite.com/info\\_sunscreens.htm](http://www.skinsite.com/info_sunscreens.htm)

**United States Environmental Protection Agency: The burning facts. Ultraviolet rays and your eyes**

<http://www.allaboutvision.com/sunglasses/spf.html>

**University of Texas-Department of Environmental Health and Safety- Heat stress policy (january 2000)**

**UV response of skin types "Intrinsic Photoprotection in Human Skin" (1991)**

<http://www.whs.qld.gov.au/conference/sun/uvr.pdf>

**Working in Hot Temperatures**

<http://www.workershealth.com.au/facts003.html>

**NOTES:**

**NOTES:**

July 2004

If you need further assistance, call the Occupational Health Clinic for Ontario Workers Inc. Closest to you.

### **HAMILTON**

**848 Main Street East  
Hamilton, ON  
L8M 1L9  
(905) 549-2552  
Toll Free: 1-800-263-2129  
Fax: (905) 549-7993  
E-mail: [hamilton@ohcow.on.ca](mailto:hamilton@ohcow.on.ca)**

### **SARNIA-LAMBTON CLINIC**

171 Kendall Street  
Point Edward, ON  
N7V 4G6  
(519) 337-4627  
Fax: (519) 337-9442  
E-mail: [sarnia@ohcow.on.ca](mailto:sarnia@ohcow.on.ca)

### **SUDBURY**

**84 Cedar Street  
2<sup>nd</sup> Floor  
Sudbury, ON  
P3E 1A5  
(705) 523-2330  
Toll Free: 1-800-461-7120  
Fax: (705) 523-2606  
E-mail: [sudbury@ohcow.on.ca](mailto:sudbury@ohcow.on.ca)**

### **TORONTO**

970 Lawrence Ave. West  
Main Floor  
Toronto, ON  
M6A 3B6  
(416) 449-0009  
Toll Free: 1-888-596-3800  
Fax: (416) 449-7772  
E-mail: [toronto@ohcow.on.ca](mailto:toronto@ohcow.on.ca)

### **WINDSOR**

3129 Marentette Avenue  
Unit #1  
Windsor, ON  
N8X 4G1  
(519) 973-4800  
Toll Free: 1-800-565-3185  
Fax: (519) 973-1906  
E-mail: [windsor@ohcow.on.ca](mailto:windsor@ohcow.on.ca)

### **PROVINCIAL OFFICE**

15 Gervais Drive  
Suite 601  
Don Mills, ON  
M3C 1Y8  
(416) 510-8713  
Fax: (416) 443-9132  
Toll Free: 1-877-817-0336  
E-mail: [info@ohcow.on.ca](mailto:info@ohcow.on.ca)

Website: <http://www.ohcow.on.ca>

Every effort has been made to ensure the accuracy of the information in this workbook. OHCOW assumes no responsibility for how this information is used.

