



Region of Waterloo  
PUBLIC HEALTH AND  
EMERGENCY SERVICES

# Safe and Healthy Children: A Public Health Resource Manual for Child Care Providers





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PUBLIC HEALTH AND  
EMERGENCY SERVICES

# Safe Outdoor Environment



# Chapter 8: Safe outdoor environments

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## Acronyms

SPF – sun protection factor (used in describing protection level of sunscreens)  
UPF – ultraviolet protection factor (used in describing protection level of clothing)  
UV – ultraviolet  
UVA – long-wave ultraviolet radiation A  
UVB – short-wave ultraviolet radiation B

## Glossary

**Age-related macular degeneration** – a deterioration or breakdown of the eye's macula. The macula is the part of the retina that is responsible for your central vision; allowing you to see fine details clearly.

**Altitude** – the height of an object or point in relation to sea level or ground level.

**Broad spectrum sunscreen** – sunscreen that provides protection against both ultraviolet radiation A (UVA) and ultraviolet radiation B (UVB), which are two types of UV radiation from the sun that can harm your skin.

**Built shade** – shade that is provided by permanent structures. Examples include buildings, arbors, gazebos, retractable awnings, shade sails and vertical panels.

**Cataracts** – a medical condition in which the lens of the eye becomes progressively opaque, resulting in blurred vision.

**Direct UV (ultraviolet) radiation** – the UV radiation you receive from being directly under the sun's rays.

**Greenhouse gases** – atmospheric gases that contribute to the greenhouse effect by absorbing infrared radiation that is produced from solar warming of the earth's surface.

**Immune system** – a system in our body that protects us from pathogens and other foreign substances, and infected cells and tissues, by producing the immune response.

**Indirect UV radiation** – the UV radiation that is reflected off the ground, objects (e.g., snow, water, concrete), or air particles (e.g., water droplets in fog).

**Latitude** – the angular distance north or south from the equator of a point on the earth's surface, measured on the meridian of the point.

**Melanoma** – a malignant tumour that starts in cells called melanocytes. Melanocytes are a type of cell that make melanin, which is the pigment that gives your skin and eyes their colour. When a tumour is referred to as malignant, it means that it can spread, or metastasize, to other parts of the body.

**Metastasize** – the spreading of a cancer through the blood or lymphatic vessels to other parts of the body.

**Natural shade** – shade that is provided from plant life. Examples include trees, multi-stemmed shrubs and climbing plants.

**Non-melanoma** –a malignant tumour that starts in the cells of the skin. When a tumour is referred to as malignant, it means that it can spread, or metastasize, to other parts of the body.

**Overexposure** – to receive too much exposure to a harmful substance (e.g., ultraviolet radiation).

**Ozone layer** – a layer of ozone in the upper atmosphere that prevents dangerous radiation from the sun from reaching the surface of the earth.

**Peak UV periods** – refers to the period of time during which the sun's UV radiation is at its strongest. In Canada this is usually from April to September and between 11 a.m. and 3 p.m.

**Portable shade** – shade that is set up and can be taken down again. Examples include pop-up tents, tarps, canopy tents and umbrellas.

**Protective actions** – steps or ways to provide protection from a harmful substance (e.g., ultraviolet radiation).

**Retinal burns** – also known as solar retinopathy, is where the clear front of the eyes, called the cornea, can be damaged by over exposure to UV radiation.

**Shade** – an area of darkness and coolness caused by shelter from direct sunlight.

**Skin cancer** – an abnormal growth of skin cells usually caused by exposure to UV radiation from the sun or tanning equipment. It can also occur on areas of the skin not ordinarily exposed to UV radiation.

**Solar radiation** – refers to all of the light and energy that comes from the sun.

**Sun protection** – actions or practices that can reduce your exposure to UV radiation.

**Sun protection factor (SPF)** – a number that refers to a product's ability to screen or block out the sun's burning rays. The higher the number, the increased protection it provides. It is not an indicator of how long you can stay out in the sun.

**Sun safety awareness** – providing information to people about the harmful effects of UV radiation, including skin cancer, and information about how they can protect themselves.

**Sunburn** – inflammation, reddening, and, in severe cases, blistering and peeling of the skin caused by overexposure to the UV rays of the sun.

**Sunscreen** – a substance formulated to prevent sunburn, skin cancers, and other conditions caused by excessive exposure to the sun, usually by absorbing and reflecting UV radiation. Sunscreen comes in many forms including lotions, sprays, and solid sticks.

**Surface reflections** – surface reflections refer to the bouncing back of a light ray and UV radiation after they hit some type of surface (ground or object).

**Ultraviolet protection factor (UPF)** – is a numerical rating given to clothing to indicate how effectively the fabric blocks UV radiation.

**UV Index** – is a forecast, provided in numerical form, of the amount of skin damaging UV radiation expected to reach the earth's surface in a geographic location, at the time when the sun is at its highest in the sky (around midday). Protective actions are recommended based on the number that is forecasted. The higher the number, the more UV radiation is expected to reach the earth's surface, and therefore the more that protection is needed.

**UV (ultraviolet) Radiation** – invisible rays that are part of the energy that comes from the sun (or tanning equipment), which can burn the skin and cause skin cancer. UV radiation is made up of three types of rays - ultraviolet A (UVA), ultraviolet B (UVB) and ultraviolet C (UVC).

**Vitamin D** – Vitamin D is found in many foods, including fish, eggs, fortified milk and cod liver oil. Sunlight helps our body produce vitamin D.

## Sun safety

It is important for children to be outside for their physical, social, mental and emotional development. However, it is also important that children enjoy the sun safely by protecting their skin and eyes.

Children are in child care centres during times of the day when UV radiation levels are at their highest. In Canada, peak UV radiation times generally occur between 11 a.m. to 3 p.m., from April to September. This means that child care centres can educate parents/guardians and children about sun safety behaviour, limit children's exposure to UV radiation and reduce a child's lifetime risk of skin cancer.

Child care centres can create a sun safe environment for children and staff by:

- Developing their own sun safety policy,
- Explaining sun safety practices to children, their parents/guardians, and staff,
- Building sun safety into everyday child care routines, and
- By ensuring shade is provided in their outdoor space.

## Background information on the sun and its health effects

### Understanding the sun and UV radiation

The sun has different types of solar radiation which impact us in different ways:

- Infrared radiation makes us feel the warmth of the sun.
- Visible light allows us to see the world around us.
- UV radiation (which cannot be seen or felt) can affect our health.

### How the sun affects your health

In addition to being outdoors and enjoying the sun, other benefits the sun provides include:

- Treating some skin conditions.
- Helping to form vitamin D in our bodies.

As with all forms of radiation, there are risks involved with getting too much exposure to UV radiation. These negative health effects include:

- Sunburns
- Premature skin aging
- Skin cancer
- Eye damage
- Weakening of the immune system

Every time skin is exposed to UV radiation from the sun, the skin's cells change. These changes build up over time and can lead to skin cancer, or indirectly, by weakening the immune system. Once your skin is damaged by the sun, the damage cannot be undone.

## How much UV radiation exposure do you get?

The level (or intensity) of UV radiation that reaches the earth's surface depends on a number of factors:

- **Time of day** – UV radiation from the sun reaches its peak period between 11 a.m. and 3 p.m. in Canada, with the highest level occurring between 12 p.m. and 1 p.m. The intensity is highest during this time as the sun's rays have the shortest distance to travel before reaching the earth's surface.
- **Season** - During the year, the sun's angle varies, which causes the intensity of UV radiation to vary. In Canada, UV radiation intensity is highest during the spring and summer months, which is generally April to September. However, the sun can still have an effect on your skin and eyes in the fall and winter, especially when UV radiation is reflected back by large surfaces of fresh snow.
- **Ozone layer thickness** - A decrease in the thickness of our ozone layer results in an increase in UV radiation intensity. This effect is greatest in the spring and can be traced back to greenhouse gases.
- **Weather conditions** - Cloud cover can greatly affect the amount of UV radiation that reaches the earth's surface. For example, clouds that are dark and full of water can absorb up to 80 per cent of the sun's radiation, whereas, high thin clouds will absorb very little UV radiation. Scattered clouds can actually increase the amount of UV radiation because of bouncing reflection of the rays.
- **Surface reflections** – UV radiation can reflect off surfaces, which can increase the amount of radiation a person is exposed to. Fresh white snow reflects up to 85 per cent of UV radiation. Other bright surfaces (like sand, concrete and water) reflect less. If you are skiing on a spring day at the end of March, for example, the reported UV Index may only be 4, but because of reflection from the snow, you may experience a UV Index of 7.
- **Altitude** – UV radiation increases with altitude (height above sea level) because the sun's rays have a shorter distance to travel before reaching the earth's surface.
- **Latitude** – UV radiation is strongest at the equator where the UV Index can reach about 12. In Canada, the UV Index is highest in southern Ontario and lowest in the North Pole.

The amount of UV radiation we receive also depends on how much time we spend under the sun.

Due to ozone depletion, Canadians are exposed to stronger and therefore greater amounts of UV radiation from the sun. More UV radiation reaches the earth's surface because the atmosphere is losing its protective abilities. Environment Canada expects that this will continue in years to come.

For more information on UV radiation and its health effects, see the Government of Canada's [Ultraviolet Radiation](#).

## Skin cancer in Canada

Skin cancer (melanoma and non-melanoma) is a growing public health concern as it is the most common cancer in Canada, and the rates continue to rise. Together, melanoma and non-melanoma skin cancer will account for nearly the same number of new cancer cases as the four major cancers combined (lung, breast, colorectal and prostate).

Melanoma is the least common form of skin cancer but is the most deadly. Unlike other skin cancers, melanoma can happen earlier in life and can progress rapidly. Melanoma is especially hard to stop once it has spread (metastasized) to organs in the body. It has been estimated that approximately 90 per cent of melanomas can be attributed to sun exposure.

The good news is that skin cancer is highly preventable through a number of sun safety practices.

## Who is at risk for developing skin cancer

Everyone is at risk for skin cancer no matter what their skin colour is. Overexposure to UV radiation from the sun or artificial UV radiation (e.g., tanning beds) is the primary cause of skin cancer. Additional factors can increase your chances of developing skin cancer. These factors include:

- Having a family history of skin cancer.
- Having a personal history of skin cancer. A person who has had skin cancer before has an increased chance of getting it again.
- Having had many sunburns over your lifetime, especially early in life.
- Excessive exposure to UV radiation, especially in childhood.
- Fair skin and skin that burns, freckles, reddens easily or becomes painful in the sun.
- Blue, green or hazel eyes.
- Blond or red hair.
- Numerous, irregular or large moles.
- A weakened immune system.
- Taking drugs that make you more sensitive to UV radiation.
- A history of deliberate tanning, including indoor tanning.
- Exposure to the sun through work and play, and especially during the periods of highest UV radiation intensity.
- Working outdoors for two hours or more (on a regular basis) when the sun is at its strongest.

## Why children need extra protection from the sun

A person's risk for developing melanoma is strongly associated with the amount or degree of sun exposure they experience early in their life (i.e., in childhood or adolescence). Therefore, frequent sun exposure and sunburns in children can put them at a higher risk for developing skin cancer later in life.

UV radiation is especially harmful to children for the following reasons:

- Children have thinner skin than adults, which makes them more prone to sun damage. This means that even a short time spent outdoors in the midday sun can result in serious burns. A burn can happen in 15 minutes or less when the UV Index is 8 or greater for both adults and children.
- Children are often outdoors during times when the sun's rays are at their strongest.
- Children spend more time outside than any other age group.

## Providing sun protection in your centre

### Implementing sun protection practices

#### Sun safety messages

There are messages that child care providers can use to help children, parents and staff be aware of sun safety. In 2016, these National Sun Safety Messages were revised. The last revision was done in 1994. The revised messages may be different to what you have heard previously but they reflect current research and help organizations across Canada use the same clear messages.

**Please note that it will take some time for all organizations to update their websites and resources with the revised messaging.**

#### The revised recommended protective actions

- Enjoy the sun safely: Protect your skin, protect your eyes.
- Protect your skin
  - When the UV Index is 3 or higher, protect your skin as much as possible. In general, the UV Index in Canada can be 3 or higher from 11 a.m. to 3 p.m. between April and September, even when it is cloudy.
    1. Seek shade or bring your own (e.g., an umbrella).
    2. Wear clothing and a wide-brimmed hat that covers as much skin as possible, as appropriate for the activity and weather.
    3. Use sunscreen labelled “broad spectrum” and “water-resistant” with a sun protection factor (SPF) of at least 30, on skin not covered by clothing. Apply sunscreen generously and reapply when required.
  - Do not use UV tanning equipment or deliberately try to get a suntan, and avoid getting a sunburn.
- Protect your eyes
  - Wear sunglasses or prescription eyeglasses with UV protective lenses.
  - Wear a wide-brimmed hat for added eye protection.

## **Additional recommended protective actions**

- Between April and September, whenever possible, plan outdoor activities for before 11 a.m. or after 3 p.m.
- Use sources of vitamin D that are safer than UV radiation exposure (e.g., through food or vitamin D supplements).

### **UV index**

The strength of the sun's rays are measured and grouped with different levels in Environment Canada's UV Index. The levels show what sun protection actions are required. The weather forecast reports the rating when the UV Index is expected to reach 3 (moderate category) or above.

You can find out the UV forecast from:

- Media (radio, TV, and newspapers),
- Environment Canada, or
- By downloading a weather app on your smartphone, tablet or computer.

For online information on UV radiation and the UV Index, see:

- [What is Ultraviolet Radiation?](#)
- [The Ultraviolet Index and Your Local Forecast](#)

The table below outlines the sun protection actions recommended at different levels of the UV Index.

UV Index	Description	Sun Protection Actions
0 - 2	Low	<ul style="list-style-type: none"> <li>• Minimal sun protection required for normal activity.</li> <li>• Wear sunglasses on bright days. If outside for more than one hour, cover up and use sunscreen.</li> <li>• Reflection off snow can nearly double the UV radiation, so wear sunglasses and apply sunscreen on your face.</li> </ul>
3 - 5	Moderate	<ul style="list-style-type: none"> <li>• Take precaution by covering up, and wearing a hat, sunglasses and sunscreen, especially if you will be outside for 20 minutes or more.</li> <li>• Look for shade near midday when the sun is strongest.</li> </ul>
6 - 7	High	<ul style="list-style-type: none"> <li>• Take full precaution by seeking shade, covering up exposed skin, wearing a hat, sunglasses and applying sunscreen.</li> <li>• Try to plan activities before 11 a.m. and after 3 p.m.</li> </ul>
8 - 10	Very High	<ul style="list-style-type: none"> <li>• Extra precaution is required, unprotected skin will be damaged and can burn quickly.</li> <li>• Seek shade, cover up, wear a hat, sunglasses and sunscreen.</li> <li>• Try to plan activities before 11 a.m. and after 3 p.m.</li> </ul>
11+	Extreme	<ul style="list-style-type: none"> <li>• Values of 11 or more are very rare in Canada. However, the UV Index can reach 14 or higher in the tropics and southern U.S.</li> <li>• Take full precaution. Unprotected skin will be damaged and can burn in minutes. Avoid the sun between 11 a.m. and 3 p.m., cover up, and wear a hat, sunglasses and sunscreen.</li> <li>• Do not forget that white sand and other bright surfaces reflect UV and increase UV exposure.</li> </ul>

## Shade

- Shade is considered one of the best approaches for reducing UV radiation exposure.
- Shade can come in different forms including natural, built and portable shade, or a combination of these:
  - **Natural shade** is shade provided by trees, multi-stemmed shrubs and climbing plants.
  - **Built shade** is shade provided by a permanent structure standing alone or attached to a building. Examples include arbors, pergolas, gazebos, retractable awnings or shade sails.
  - **Portable shade** is shade provided by pop-up tents, temporary shade sails/tarps, canopy tents and umbrellas.
- Good shade can also provide protection from the side, and not just overhead, to protect against scattered and reflected UV radiation that may come from different surfaces (e.g., sand, concrete, water).

For more information on assessing and creating shade or reducing reflected UV radiation in your outdoor space, see the [Region of Waterloo Shade](#).

## Hats and clothing

- Hats should have a wide brim that covers the head, face, ears and neck. Many skin cancers happen on the face and neck, so these areas need extra protection. Hats like baseball caps won't give enough protection.
- Cover up as much of the skin as you can with loose fitting, tightly woven clothing. **Clothes provide better protection than sunscreen.**
- When clothes get wet, the fabric gets stretched and the protection it provides is reduced.
- Some clothing is specially made to block UV radiation. The clothing's label shows the UV protection factor (UPF). UPF measures a fabric's ability to block UV radiation from passing through and reaching the skin. The higher the UPF, the better protection it provides. The fabrics used for this clothing are often lightweight and some may be treated with ingredients to help block UV radiation. A UPF of 50+ blocks most UV radiation.

## Sunscreen

There has been a lot of concern expressed by the public around the safety of sunscreen and parents may come to your centre with these concerns. No published studies show that sunscreen is toxic to humans or hazardous to human health. Health Canada regulates the safety, effectiveness and quality of sunscreens in Canada.

For information on how Health Canada ensures the safety of sunscreen products sold in Canada, see the [Government of Canada's Sunscreen](#).

**When to use sunscreen:**

- When the sun's UV rays are at its strongest, such as when the UV Index is 3 or higher, usually from 11 a.m. to 3 p.m.
- When the child is around highly reflective surfaces (no matter the season). For example, playing around fresh snow.

**Use a sunscreen that is labelled as:**

- SPF of 30 or higher (sun protection factor)
- Broad spectrum (UVA and UVB protection)
- Water-resistant

**How to apply sunscreen:**

- Apply sunscreen on skin that is not covered by protective clothing 20 minutes prior to going outdoors.
- Put sunscreen on the ears, chin and neck even when wearing a hat.  
Use plenty of sunscreen to cover the skin.  
Most adults need:
  - Two to three tablespoons of sunscreen lotion to cover the body, and
  - One teaspoon of sunscreen lotion to cover the face and neck.
- If using a spray sunscreen:
  - Spray generously and spread evenly by hand 20 minutes before sun exposure.
  - Hold container four to six inches from the skin to apply.
  - Do not spray directly onto face, instead spray the palms of the hands then apply to face.
  - Do not apply in windy conditions and use in a well-ventilated area.
  - Avoid inhaling or exposing others to spray.
- When applying both sunscreen and insect repellent, first apply the sunscreen and allow it to absorb for 30 minutes. Then apply the repellent.
- Reapply sunscreen as needed, especially after sweating, swimming or toweling off.
- Lips need protection too. Apply a sunscreen lip balm and reapply after eating and drinking or swimming.

For online information on sunscreen, see:

- [Canadian Cancer Society – Sunscreen 101- Quick tips on using Sunscreen products](#)
- [Government of Canada's Sunscreens](#)

**Eye protection**

- Children have large pupils and clear lenses, allowing a lot of sunlight to enter.
- Long- and short-term exposure to UV radiation can lead to eye damage including cataracts, retinal burns, and age-related macular degeneration.

- UV radiation can harm the eyes at **any time of day and all year round**, even when it's cloudy.
- Eye protection is needed when there is snow, sand, or water nearby because they reflect a lot of UV radiation.
- Children and babies need to wear 100% UVA/UVB protection sunglasses which are unbreakable. Sunglasses labels may say "100% UV protection" or "UV 400".
- Wear a wide-brimmed hat for added eye protection however this will not protect eyes from UV radiation reflected off of surfaces.

For more information on sunglasses, see the [Government of Canada's Sunglasses webpage](#).

### Babies and sun protection

- Babies under 12 months of age should be kept out of direct sunlight (e.g., using a stroller with a hood or canopy under an umbrella or in a heavily shaded area.)
- Long walks are best in the early morning or late afternoon. Limit sun exposure for long periods with an infant between 11 a.m. and 3 p.m., and especially around noon.
- Babies should wear sun hats with a wide brim and dressed in loose-fitting, lightweight clothing that covers their legs and arms.
- Using sunscreen with babies:
  - Sunscreen is **not** recommended for babies under six months of age.
  - For babies over six months of age, sunscreen may be applied to areas of the skin that are not covered by clothing, such as the face and the backs of the hands. Avoid their mouth and eye area when applying sunscreen.
  - Sunscreen will not harm their eyes but may cause some minor stinging if it gets in their eyes.

For information on babies and sun protection, see [Canadian Dermatology Association's Sun Safety for Parents – Children & Babies](#).

### Vitamin D and the sun

- Vitamin D is important for a child's growth and development. The body can produce vitamin D when skin is exposed to the sun. However, Health Canada recommends getting vitamin D through other sources that are safer than sun exposure, e.g., through food or vitamin D supplements.
- Direct parents/guardians to their health care provider if they have concerns or questions related to vitamin D.

### Creating a sun safety policy

Sun safety policies and guidelines work best if they are revised and updated every year. You may want to consider gathering feedback from staff about what is working or not working, and how policy and practice improvements can be made.

Below you will find resources to support you in developing/reviewing your sun protection policy.

- [SunSense Sun Safety Policy Guidelines for Schools, Daycare Centres and Camps](#)

### Example policy

The sun safety policy provided below is intended to serve as an example only. Child care centres can adapt this example to meet the needs of their centre:

- [Child Care Sun Safety Policy Example](#)

### Increasing sun safety awareness with children, parents/guardians and staff

For online resources for your display board, see:

- [Rain, Shine Or Snow, Protect Your Skin From The Sun poster](#)
- [Government of Canada's UV Index Poster](#)

For online children's sun safety activities, videos and resources see:

- [Sun Safe Play Every Day Video](#)
- [Be Sun Safe Colouring Sheet](#)
- [SunSmart Countdown Activities](#)

For online sun safety resources for parents/guardians, see:

- [Sun Safety Tips for Parents](#)
- [Sun Safety and Skin Cancer](#)

### Protecting staff from UV radiation exposure at work

While sun safety is a shared responsibility between employers and employees, it is clear that employers have certain legal obligations.

The Ontario Occupational Health and Safety Act requires employers to take every precaution reasonable under the circumstances to protect the health and safety of their staff.

For more information on sun protection in the workplace, see the following online resources:

- [Ontario Occupational Health and Safety Act](#)
- [Sun Safety at Work](#)
- [Ontario Ministry of Labour's Ultraviolet Radiation Guidelines](#)

### Outdoor air quality

Children enjoy spending time outdoors. There are times when the air we breathe may be impacted by air pollution. Children and newborns are more vulnerable to the effects of air pollution because:

- A child's immune and respiratory symptoms are less developed.

- Children breathe in more air than adults and they breathe faster than adults especially during strenuous activity and play.
- Children tend to breathe through their mouths and by-pass the natural filtering system in the nose. This allows larger amounts of polluted air to flow directly into their lungs.
- Children spend more time outside.

## Smog

Smog, the grey-brown haze that sometimes accompanies hot days, is a term used to describe a harmful mixture of air pollutants. It is usually formed by a combination of ground level ozone and small particles, as well as gases, road and construction dust, sunlight and heat.

## Health effects

The impact of air pollution and smog on human health will vary depending on factors such as:

- The concentration of pollutants
- The frequency and duration of exposure
- A person's age and general health status

Peaks in air pollution can:

- Lead to coughing and wheezing, and make it harder to breathe
- Irritate the eyes, nose and throat
- Aggravate existing lung and heart conditions, such as asthma, chronic bronchitis, emphysema and angina

People with heart and lung problems, older adults and **children** are at higher risk of health effects. These may also occur in healthy people, particularly those who work or exercise outdoors.

## Air Quality Health Index

It is important to consider the quality of the air before organizing outdoor physical activity. The Air Quality Health Index (AQHI) is a health protection tool that is designed to help you make decisions to protect your health (e.g., limiting short-term exposure to air pollution and adjusting your activity levels during increased levels of air pollution). Be sure to check the air quality often to determine your activities outdoors.

When a high risk AQHI value is expected to last 1-2 hours a **Special Air Quality Statement (SAQS)** will be issued by Environment and Climate Change Canada (ECCC) and [Air Quality Ontario](#).

When conditions are expected to last for at least three hours or more, a **Smog and Air Health Advisory (SAHA)** will be issued by ECCC and Air Quality Ontario. When a SAQS or SAHA is issued, it is important to consider reducing or rescheduling physical activity outside.

## Check online for AQHI status:

[Kitchener: Hourly Air Quality Health Index](#) (Note: the Kitchener air quality monitoring station is the only station listed for Waterloo Region).

## You can sign up for AQHI email alerts here:

[Sign Up: Air Quality Alert Email Notifications](#)

This information will help you decide when outdoor activities should be rescheduled or modified.

### If there is a special air quality statement or smog and air health advisory

- Ensure children avoid strenuous exercise and limit outdoor activity where possible.
- Reschedule or plan outdoor activities for early in the morning or later in the day when pollutant levels are lower.
- Stay away from high traffic areas to reduce exposure to vehicle exhaust.
- Keep children well hydrated by drinking lots of clear fluids.
- Seek medical attention for those experiencing symptoms such as a tight chest, coughing, wheezing.

For more information about AQHI see the [Air Quality Health Index](#).

## Extreme weather

### What is extreme weather?

[Climate change](#) is likely to have wide-ranging effects on human health in the coming years. Extreme weather events are becoming more common and with that, heat waves and “cold snaps” may become more frequent. Both extreme prolonged heat and extreme cold events present several risks to children. Compared to adults, children are more susceptible to the effects of extreme heat and cold. They cannot dissipate heat or maintain core body temperature the same way an adult can. This puts them at risk for heat or cold related illnesses. Precautions need to be taken if learning and play are going to occur outdoors.

### Extreme heat

#### Extreme heat and health

Extreme prolonged heat can be a challenge for the human body and children are especially vulnerable to the effects of extreme heat. During extreme heat events, temperatures can overwhelm a child’s body leading to sweating or overheating causing heat related illnesses to occur. Children have a high metabolic rate and as a result, produce more heat. Their capacity to sweat is not as effective as adults; so it is more difficult for them to release heat from their bodies. Dehydration is also greater in children. Children rely on others to provide adequate fluids to them to stay hydrated.

Children most at risk include those with breathing difficulties (asthma), heart conditions, kidney problems, mental and physical disabilities, developmental disorders, diarrhea and those who take certain medications.

### Heat and humidity

Humidity refers to the amount of water present in air. The humidex is an index that describes how hot weather feels. It takes both temperature and humidity into consideration to derive a perceived temperature and comfort level. When the humidity is high, sweat does not evaporate as well from the body.

### Heat warnings

Environment and Climate Change Canada (ECCC) will issue a public Heat Warning for Waterloo Region when one of the following conditions is met:

- Two consecutive days where the temperature is forecasted to be at or over 31 degrees Celsius during the day and at or over 20 degrees Celsius over night, and/or
- Two consecutive days where the humidex is forecasted to be 40 or more
- Public Health will provide updates on social media [@ROWPublicHealth](#)

You can receive ECCC alerts directly by:

- Signing up for ECCC email alerts from [EC Alert Me](#)
- Downloading the mobile [WeatherCAN](#) app
- Accessing [Public Weather Alerts](#)
- Watching public weather broadcasts/news stations

### Precautions for hot days

Keep the children cool and hydrated by:

- Ensuring children drink plenty of fluids (especially water; non-caffeinated beverages) — even more than their thirst indicates.
- Have children wear lightweight, light-coloured, loose-fitting clothing.
- Staying cool indoors and if possible, in an air-conditioned place.
- Having electric fans to provide comfort by increasing evaporation. However, when the conditions are extreme, fans will not prevent heat-related illness.
- Keeping physical activity to a minimum.
- Drawing blinds/curtains to prevent radiant heat from the sun from entering classrooms.
- Rescheduling or planning outdoor activities during cooler parts of the day.
- Using water play and water tables.
- Misting the children with a small spray bottle.
- Moving learning and play to an air-conditioned area (if possible).
- Keeping the children in the shade or protected from the sun by wearing a wide-brimmed, breathable hat or shade them with an umbrellas.
- Taking the children to an air-conditioned space such as a public library or [Cooling Centre](#).
- Taking the children to a splash pad for water play.

## Recognizing and responding to heat-related illness

Heat-related illness occurs when the body overheats. It is caused by prolonged exposure to high temperatures, and can be made worse by high humidity. The signs and symptoms of heat-related illness can range from mild to severe and can progress rapidly. If you are unsure, treat it like a life-threatening emergency and start cooling measures immediately.

### **Severe heat related illness:**

Severe heat-related illness is a life-threatening emergency. Act immediately to get help and start emergency cooling measures.

- Any of the following can be signs and symptoms of severe heat related illness:
  - Fainting or loss of consciousness
  - Unusual confusion or disorientation
  - Severe nausea and vomiting
  - Difficulty speaking
  - Unusual coordination problems
  - Hot, flushed skin or very pale skin
  - Not sweating
  - Rapid breathing and faint, rapid heart rate
  - Body temperature >39 degree Celsius
  - Very low, dark urine output

### **Emergency measures:**

If someone is experiencing severe heat-related illness, take all of the following actions:

- Call 911 immediately.
- Stay with the individual until emergency services arrive.
- Move to a cooler area, if possible.
- Remove excess clothing
- Have the individual rest comfortably flat on their back facing up or in a semi-upright position and offer water.
- Apply cool, wet towels or ice packs around the body, especially to the neck, armpits and groin, until emergency services arrive.

### **Moderate heat-related illness:**

Moderate heat related illness could rapidly become severe heat-related illness.

Immediate cooling is important to prevent progression:

- Any of the following can be signs and symptoms of moderate heat-related illness:
  - Nausea
  - Light-headedness
  - Weakness
  - Extreme fatigue, malaise

- Very thirsty or dry mouth
- Difficulty swallowing
- Heat rash, unusual swelling, or cramps
- Rapid heart rate
- Body temperature > 38 degree Celsius
- Reduced, dark urine output

### **Mild heat-related illness:**

Mild heat-related illnesses can rapidly become severe heat-related illness. Immediate cooling is important to prevent progression.

- Any of the following can be signs and symptoms of mild heat-related illness:
  - Feeling unwell
  - Dizziness
  - Headache
  - Irritability
  - Fatigue
  - Thirst
  - Skin feels very warm and sweaty
  - Increase in resting heart rate
  - Reduced urine output

### **Immediate measures for mild to moderate heat-related illness:**

If someone is experiencing mild to moderate heat-related illness, take as many of the following cooling actions as possible:

- Relocate individual to a cooler area.
- Remove excess clothing and provide low-level fanning.
- Activate air condition or open windows in different areas to create cross breeze.
- Keep the individual resting comfortably flat on their back facing up or in a semi-upright position.
- Encourage sitting upright and drinking water
- Apply cool, wet towels or ice packs around the body, especially to the neck, armpits, and groin.
- Call 911 if symptoms persist or get worse.

For more information about health checks during extreme heat events, please see: [A guide to doing in-person and remote heat checks.](#)

#### [Helpful resources](#)

Health Canada brochure: [Keep children cool! Protect your child from extreme heat](#)

[Health checks during extreme heat events: A guide for doing in-person or remote health checks](#)

## Extreme cold

### Extreme cold and health

Extreme cold can pose many dangers to children and their caregivers. Children are not able to regulate their internal body temperature as well as adults and therefore caution must be taken during the late fall and winter months.

Cold injuries occur when the body loses heat faster than it can maintain it. They can be localized (frost bite, frost nip) or generalized (hypothermia). If you suspect a child has a cold injury, it is always recommended to seek medical attention. Winter asthma may also be triggered or aggravated due to cold, dry air. Monitor children suffering from asthma closely.

### Wind Chill

As with humidex during the summer, [wind chill](#) is an important winter risk factor to consider when planning outdoor learning and play in the winter months. Wind chill takes into consideration the cooling effect seen from temperature and wind. Wind takes the protective layer of air close to the skin away and draws heat away from the body.

### Wind chill hazards and what to do

Wind chill	Exposure risk	Health concerns	What to do
0 to -9	Low Risk	<ul style="list-style-type: none"><li>• Slight increase in discomfort</li></ul>	<ul style="list-style-type: none"><li>• Dress warmly</li><li>• Stay dry</li></ul>
-10 to -27	Moderate risk	<ul style="list-style-type: none"><li>• Uncomfortable</li><li>• Risk of <a href="#">hypothermia</a> and <a href="#">frostbite</a> if outside for long periods without adequate protection.</li></ul>	<ul style="list-style-type: none"><li>• Dress in layers of warm clothing, with an outer layer that is wind-resistant.</li><li>• Wear a hat, mittens or insulated gloves, a scarf and insulated, waterproof footwear.</li><li>• Stay dry</li><li>• Keep active</li></ul>

Wind chill	Exposure risk	Health concerns	What to do
-28 to -39	High risk: exposed skin can freeze in 10 to 30 minutes	<ul style="list-style-type: none"> <li>• High risk of <a href="#">frostnip</a> or <a href="#">frostbite</a>: Check face and extremities for numbness or whiteness.</li> <li>• High risk of <a href="#">hypothermia</a> if outside for long periods without adequate clothing or shelter from wind and cold.</li> </ul>	<ul style="list-style-type: none"> <li>• Dress in layers of warm clothing, with an outer layer that is wind-resistant.</li> <li>• Cover exposed skin</li> <li>• Wear a hat, mittens or insulated gloves, a scarf, neck tube or face mask and insulated, waterproof footwear.</li> <li>• Stay dry</li> <li>• Keep active</li> </ul>
-40 to -47	Very high risk: exposed skin can freeze in 5 to 10 minutes*	<ul style="list-style-type: none"> <li>• Very high risk of <a href="#">frostbite</a>: Check face and extremities for numbness or whiteness.</li> <li>• Very high risk of <a href="#">hypothermia</a> if outside for long periods without adequate clothing or shelter from wind and cold.</li> </ul>	<ul style="list-style-type: none"> <li>• Dress in layers of warm clothing, with an outer layer that is wind-resistant.</li> <li>• Cover all exposed skin.</li> <li>• Wear a hat, mittens or insulated gloves, a scarf, neck tube or face mask and insulated, waterproof footwear.</li> <li>• Stay dry</li> <li>• Keep active</li> </ul>
-48 to -54	Severe risk: exposed skin can freeze in 2 to 5 minutes*	<ul style="list-style-type: none"> <li>• Severe risk of <a href="#">frostbite</a>: Check face and extremities frequently for numbness or whiteness.</li> <li>• Severe risk of <a href="#">hypothermia</a> if outside for long periods without adequate clothing or shelter from wind and cold.</li> </ul>	<ul style="list-style-type: none"> <li>• Be careful. Dress very warmly in layers of clothing, with an outer layer that is wind-resistant.</li> <li>• Cover all exposed skin</li> <li>• Wear a hat, mittens or insulated gloves,</li> </ul>

Wind chill	Exposure risk	Health concerns	What to do
			a scarf, neck tube or face mask and insulated, waterproof footwear. <ul style="list-style-type: none"> <li>• Be ready to cut short or cancel outdoor activities.</li> <li>• Stay dry</li> <li>• Keep active</li> </ul>
-55 and colder	Extreme risk: exposed skin can freeze in less than 2 minutes*	<ul style="list-style-type: none"> <li>• DANGER! Outdoor conditions are hazardous.</li> </ul>	<ul style="list-style-type: none"> <li>• Stay indoors</li> </ul>

\* In sustained winds over 50 km/h, frostbite can occur faster than indicated.

Source: <https://www.canada.ca/en/environment-climate-change/services/weather-health/wind-chill-cold-weather/wind-chill-index.html#fn1>

### Extreme cold warnings

Extreme Cold Warnings for Waterloo Region are issued by Environment and Climate Change Canada when the temperature or wind chill is expected to reach minus 30 degrees Celsius for at least two hours. At these temperatures, the risk of frostbite is imminent (within 10 to 30 minutes). People who are unable to keep warm or find shelter are also at an increased risk of developing hypothermia in a shorter period of time. When an Extreme Cold Warning is issued, Public Health will provide updates through social media [@ROWpublichealth](https://twitter.com/ROWpublichealth).

You can receive ECCC alerts directly by:

- Signing up for ECCC email alerts from [EC Alert Me](#)
- Downloading the mobile [WeatherCAN](#) app
- Accessing [Public Weather Alerts](#)
- Watching public weather broadcasts/news stations

### Precautions for extreme cold days

Keep the children warm and protected by:

- Covering exposed skin.

- Ensuring children wear winter hats, mittens and scarves. Up to 40 per cent of body heat loss can occur through the head. Choose winter wear that will protect the chin, lips and cheeks against frost nip and frostbite.
- School boards recommend that children should be kept indoors if the temperature falls below  $-25^{\circ}\text{C}$ , or  $-28^{\circ}\text{C}$  or greater with the wind chill.
- Drinking warm fluids, ensure they are caffeine free.
- Wearing clothes in layers including hats, mittens and scarves.
- Keeping the children moving. Limit time sitting still.
  - Keep in mind that physical activity can result in sweating and sweat can freeze. Be sure to remove wet clothes and keep children dry.
- Keeping children sheltered from the wind, this can reduce wind chill exposure.
- Monitoring children for signs of frostbite and hypothermia.
- Taking the children to a warm space such as a public library or [Warming Centre](#).

### Recognizing and responding to cold injuries\*

#### **Frostnip**

- A mild form of frostbite, where only the skin freezes.
- Skin appears yellowish or white, but feels soft to the touch.
- Painful tingling or burning sensation

#### **What to do:**

- Do not rub or massage the area.
- Warm the area gradually - use body heat (a warm hand) or warm water.
- Avoid direct heat which can burn the skin.
- Once the affected area is warm, do not re-expose it to the cold.

#### **Frostbite**

- A more severe condition, where both the skin and the underlying tissue (fat, muscle, bone) are frozen.
- Skin appears white and waxy and is hard to the touch.
- No sensation - the area is numb

#### **What to do:**

- Frostbite can be serious and can result in amputation, get medical help.
- Do not rub or massage the area.
- Do not warm the area until you can ensure it will stay warm.
- Warm the area gradually - use body heat, or warm water ( $40$  to  $42^{\circ}\text{C}$ ).
- Avoid direct heat which can burn the skin.

#### **Hypothermia**

- Being cold over a prolonged period of time can cause a drop in body temperature (below the normal  $37^{\circ}\text{C}$ ).
- Shivering, confusion and loss of muscular control (e.g., difficulty walking) can occur.
- Can progress to a life-threatening condition where shivering stops or the person loses consciousness.
- Cardiac arrest may occur

### What to do:

- Get medical attention immediately.
- Lay the person down and avoid rough handling, particularly if the person is unconscious.
- Get the person indoors.
- Gently remove wet clothing.
- Warm the person gradually and slowly, using available sources of heat.

\*Source: [Government of Canada – Cold Injuries](#)

### Emergency preparedness

It is important to have an [emergency plan](#) and an [emergency kit](#) for your child care centre. You should be prepared to be in an emergency for at least 72 hours.

The plan will help you and the children in your care react quicker in an emergency - especially if you are required to evacuate.

Things to consider when making the plan:

- Plan how and where to meet and how to contact one another.
- Discuss what you should do at home, at school or at work if an emergency happens.
- Plan to use the stairs instead of the elevators if you live in an apartment.
- Keep your plan in an easy-to-find, easy-to-remember place.
- Make a list of what needs to be done ahead of time.
- Store important family documents in waterproof containers.
- Write down and practice your plan with the entire family at least once a year.

### Alert waterloo region

Alert Waterloo Region (AlertWR) is a local service that allows you to receive important public safety messages in the event of a large scale emergency such as a flood, severe weather, or other emergency situations.

[AlertWR](#) has information about programs, plans and how to prepare for emergencies or disasters.

To subscribe, visit: [Subscribe to Alert Waterloo Region](#)

### Get Prepared

The Government of Canada shares information about understanding the risks in your area, creating a household emergency plan and building an emergency kit. The [Get Prepared](#) website has more information.

## Vector-borne diseases

Vector borne diseases can pose a threat to Ontarians. Vector borne diseases are spread to people through the bite of an infected insect such as a mosquito or tick. In Ontario, West Nile virus and Lyme are the vector-borne diseases of interest.

### West Nile virus (WNV)

WNV is a disease primarily seen in birds, but it can be spread to people through the bite of an infected mosquito. Mosquitoes can become carriers of the virus when they feed on infected birds. The majority of people infected with West Nile virus show no symptoms. One in five will develop mild flu-like symptoms and one in 150 can develop serious neurological symptoms. While symptoms that are more serious can occur at any age, adults over the age of 50 and those with compromised immune systems are at highest risk. The usual time from infection until symptom onset ranges from 2 to 15 days.

### How can you prevent WNV?

- Use personal protection to prevent mosquito bites.
  - Mosquitoes are most active between May to September when the weather is warmer. Mosquitoes are most active during the hours of dusk to dawn.
  - If exposure to mosquitoes is anticipated, take the following precautions:
  - **Use an insect repellent containing DEET or Icaridin according to the manufacturer's recommendations (read the label to ensure safe use on children).** Be sure to apply sunscreen first, wait at least 30 minutes, and then apply insect repellent.
  - **When outdoors, wear protective clothing including tightly woven, light coloured, long-sleeved shirts, pants, socks with shoes and a hat.**
  - Visit the [Insect and Animal Diseases](#) for more specific information on using DEET or Icaridin containing insect repellants on children.
  - For more specific information on insect repellents visit the [Government of Canada website](#).
- Prevent mosquitoes from entering buildings.
  - Ensure that window and door screens at your centre are tight-fitting and in good repair.
- Reduce mosquito breeding sites on child care centre property.
  - Mosquitoes lay their eggs in stagnant water. Removing or draining stagnant water can reduce the number of mosquitoes around your centre. Areas to check are roof gutters, planters, birdbaths, recycling containers, toys that hold water and water play equipment.
  - For more information, view the [Fight the Bite](#) brochure or [Region of Waterloo Insect and Animal Diseases](#)

## Lyme disease

Lyme disease is a tick-borne disease that is spread to humans and pets through the bite of an infected blacklegged tick (*Ixodes scapularis* or Deer Tick). Blacklegged ticks are commonly found in wooded areas, on long grasses along walking or hiking trails or in overgrown areas between forests and open spaces. Waterloo Region is not considered a [high risk area](#) for Lyme disease and not all blacklegged ticks carry the bacteria (*Borrelia burgdorferi*) responsible for causing Lyme disease.

You cannot tell if a tick is carrying the bacteria responsible for Lyme by looking at it. Prompt removal (within 24 hours) reduces the chance of acquiring the bacteria that causes Lyme. Symptoms may develop within 3 to 30 days after being bitten by a tick. Initial symptoms can vary, but could include:

- Fatigue
- Fever
- Chills
- Skin rash (may resemble a bulls eye, but may not be seen in all cases)
- Headache
- Muscle pain or weakness

## How can you prevent Lyme?

- Protect yourself from tick bites while spending time outdoors in areas where ticks may be present.
  - Wear an insect repellent that contains DEET or Icaridin (active ingredient to keep bugs away) and always follow manufacturer's directions for application read the label to ensure safe use on children.
  - Wear light coloured clothing that allows ticks to be easily seen and removed.
  - Wear socks and closed footwear.
  - Check yourself and others for ticks following outdoor activities in areas where ticks might be present. Be sure to check areas such as the groin, ankles, navel, scalp, behind ears and in armpits.
  - Clothing can be put into a dryer on high heat for at least 60 minutes to kill ticks.
  - For more information on [how to identify a blacklegged tick](#).
  - See the [Region of Waterloo tick ID card](#) for more information

## I found a tick attached to a child! What should I do?

Removing a tick promptly is important in preventing Lyme disease. Be sure to follow these steps:

1. Using clean fine-tipped tweezers, carefully grasp the tick as close to the skin as possible. Pull slowly upward, but try not to twist or crush the tick.
2. Once the tick is removed, wash the area with soap and water or disinfect with rubbing alcohol or hand sanitizer.
3. If parts of the tick's mouth break off and remain in the skin, remove them with tweezers. If this is difficult to do, leave them alone and let the skin heal. If the area appears to become infected, seek medical attention.
4. If possible, save the tick in a zip-lock bag or bottle with a secure lid. Record the location and date of the bite.
5. Advise the parent if a tick is found on the child.
6. Encourage the parent to use the website [eTick.ca](#) to identify the tick.
  - a. eTick is a public platform for image-based tick identification. There is no cost to use this platform and the website is best viewed with Chrome, Safari, or Firefox. You will receive identification results within 48 hours along with public health education and awareness messaging.

**If through eTick.ca, the tick is identified as a blacklegged (*Ixodes scapularis*) tick or cannot be identified, the parents or guardians should contact their health care provider, particularly if the child is feeling unwell.** The parents or guardians can discuss next steps to take, if any, for the child's health. The doctor will need to know where you were when the child got the tick bite to help them assess your risk of Lyme

disease. The risk of infection is low if a tick was attached to your skin for less than 24 hours.

Watch this video for tips on removing a tick: [How to properly remove a tick](#)

For more information, visit: [Region of Waterloo – Insect and Animal Diseases](#)

## Recreational water

### General water safety

[Recreational water](#) illnesses in children may happen after swallowing contaminated water while swimming at a local beach, wading pool, swimming pool or splash pad. Properly maintained pools can spread illness, as some germs are resistant to chlorine. Follow these easy steps to help keep germs out of the water and stay healthy:

- Stay out of the water if you have diarrhea. This is especially important for children in diapers. Germs can spread in the water and make others sick.
- Shower before getting into the water. Pool chemicals do not work right away so it is important to wash away any pee, poop, sweat and dirt before going into the water.
- Take children to the washroom prior to swimming and have regular bathroom breaks to avoid children peeing or pooping in the water.
- Change diapers in bathroom or diaper changing area. Diaper changes must not be poolside.
- Wash hands with soap and dry with paper towels after using the toilet or diaper changing.
- Don't swallow pool or lake water. Talk to children about keeping water out of their mouths.
- Only use inspected swimming pools and beaches. **Do not swim in water if the beach has been closed due to high bacterial counts, or in the 24 hours after a heavy rainfall.**

Public health inspectors inspect recreational water facilities, including public pools, public spas/hot tubs, splash pads, water slide receiving basins and wading pools.

Inspection results of all public pools, hot tubs and splash pads are available online at [Check it! We inspect it.](#)

## Bed bugs

Bed bugs are small, oval shaped, brownish insects, about the size of an apple seed that feed on the blood of animals or people. After feeding the bed bug body swells and they become a reddish colour. Bed bugs move around quickly over floors, walls and ceilings. They do not jump or fly. Bed bugs are mainly active at night and tend to bite people while they are asleep. Some people do not react to bed bug bites but others may

develop skin reactions including itchy welts. Keeping the bite site clean and avoiding itching will help to prevent infection. Bed bug bites do not usually require any medical treatment.

Currently, bed bug infestations in child care centres are relatively uncommon, but bed bugs can hitchhike into the centre on clothing, stuffed toys and on backpacks. In general, infestations are most common in multi-unit dwellings, but they can also occur in a variety of other locations including hotels, hospitals, group homes and movie theatres.

If you suspect a child has bed bugs in their home or if you observed bed bug bites on a child:

- Do not exclude the child or send the child home.
- Contact parents or family members to discuss the situation.
- Discreetly inspect the child's belongings for bed bugs.
- Personal belongings should be placed in sealed bins or bags, labelled and be isolated if possible.
- Bedding should be washed using the hottest possible setting and dried using high heat for at least 30 minutes.
- Keep items that are brought from home to a minimum.

Prevention of Bed Bugs in a Child Care Setting:

- Have trained staff regularly inspect the facility for bed bugs
  - Use a flashlight to look for bed bugs and their dark droppings.
  - Check sleeping areas such as cots and the seams of the mattress of cribs.
  - Use heat, such as a hair dryer, to draw bed bugs out of cracks and crevices.
  - Use a playing card or credit card to force bed bugs out of cracks and crevices.
  - Check all furniture, paying attention to cracks, crevices, joints, screw holes and the underside of the items.
  - Check all plush furniture, paying attention to the seams and folds and the underside of the item.
  - Check toys, play areas, children's cubbies and locker spaces.
- Keep the facility uncluttered and discourage children and parents from bringing items from home.
- Provide education to parents and staff about bed bugs

If a bed bug infestation is suspected in your centre:

- Capture a bug to have it identified by a pest control specialist
- Contact a pest control specialist for inspection and treatment if required

For more information see: [Bed Bugs](#)

## Factsheets and resources

1. [What is Ultraviolet Radiation?](#)
2. [The Ultraviolet Index and Your Local Forecast](#)
3. [Region of Waterloo Shade Webpage](#)
4. [Government of Canada's Sunscreen webpage](#)
5. [Canadian Dermatology Association's Sunscreen FAQ](#)
6. [Government of Canada's Sunglasses webpage](#)
7. [Canadian Dermatology Association's Sun Safety Tips – Children and Babies](#)
8. [SunSense Sun Safety Policy Guidelines for Schools, Daycare centres and Camps](#)
9. [Child Care Sun Safety Policy Example](#)
10. [Rain, Shine Or Snow, Protect Your Skin From The Sun poster](#)
11. [Government of Canada's UV Index Poster](#)
12. [Sun Safe Play Every Day Video](#)
13. [Be Sun Safe Colouring sheet](#)
14. [SunSmart Countdown Activities](#)
15. [Sun Safety Tips for Parents](#)
16. [Sun Safety and Skin Cancer](#)
17. [Ontario Occupational Health and Safety Act](#)
18. [Sun Safety at Work](#)
19. [Ontario Ministry of Labour's Ultraviolet Radiation Guidelines](#)
20. [Fight the Bite Brochure](#)
21. [How to identify a blacklegged tick.](#)