

FACTS ON SKIN CANCER IN ONTARIO

News and information on ultraviolet radiation

Introduction

Ultraviolet radiation (UVR) has long been recognized as carcinogenic.¹ Exposure early in life (i.e. during childhood and adolescence) seems to be particularly important in terms of skin cancer risk.² Traditionally, the main source of UVR exposure in Ontarians for tanning purposes has been the sun, but artificial tanning equipment now represents an increasingly important exposure source, especially among adolescents and young adults.³ There is strong evidence that this source of exposure increases the risk of melanoma,⁴ and the U.S. Department of Health and Human Services National Toxicology Program has labeled tanning equipment as carcinogenic.⁵ Key health authorities around the world are clear on the need for regulation of tanning equipment, operation and access.

Ultraviolet Radiation (UVR)

Ontarians are exposed to UVR from the sun or from tanning equipment (tanning beds, tanning booths and sun lamps). There are 3 types of UVR:

- Ultraviolet A rays (UVA) make up most of the sun's UV. They can penetrate deep into the skin causing DNA damage, wrinkles and aging. These rays are partially screened out by the atmosphere.
- Ultraviolet B rays (UVB) are the most damaging to our skin. They are the main cause of sunburns and DNA damage as they are nearly 1000 times more capable of inducing sunburn than UVA rays. Most of these rays are absorbed by the ozone layer in the earth's atmosphere.
- Ultraviolet C rays are the most biologically active but never reach the earth's surface because they are filtered by oxygen and ozone in the upper atmosphere. They should never be present in tanning lamps.

In Canada, sunlight is strong enough to cause skin cancer and premature aging of the skin. UVR can pass through clouds, fog and haze. Water, sand, concrete and especially snow can reflect, and even increase by reflection, the sun's burning rays.⁶ Most tanning equipment emits both UVA and UVB rays in amounts that can exceed that from the midday summer sun.⁷

1 International Agency for Research on Cancer (IARC), Solar and ultraviolet radiation: *IARC monographs on the evaluation of carcinogenic risks to humans*, Vol. 55, 1992.

2 Armstrong, B.K. 'Sun exposure in skin cancers', Chapter 7, *Epidemiological Causes and Prevention of Skin Diseases*: Grab, J.J., Stern, R.S., McKie, R.M. and Weinstock, M.A., editors Oxford Blackwell Science 1997, p. 63-66.

3 Sanderson, R. Artificial Tanning Use in London-Middlesex, Report No. 038-05, 2005.

4 Gallagher, R.P., Spinelli, J., Lee, T.K., "Tanning Beds, Sunlamps, and Risk of Cutaneous Malignant Melanoma," *Cancer Epidemiology Biomarkers & Prevention* 2005; 14(3): 562-566.

5 U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, *Report on Carcinogens, Eleventh Edition*, 2005.

6 www.cancer.ca

7 Sinclair, C., *Artificial Tanning Sunbeds: Risks and Guidance*, World Health Organization, 2003.



Canadian Cancer Society
Société canadienne du cancer

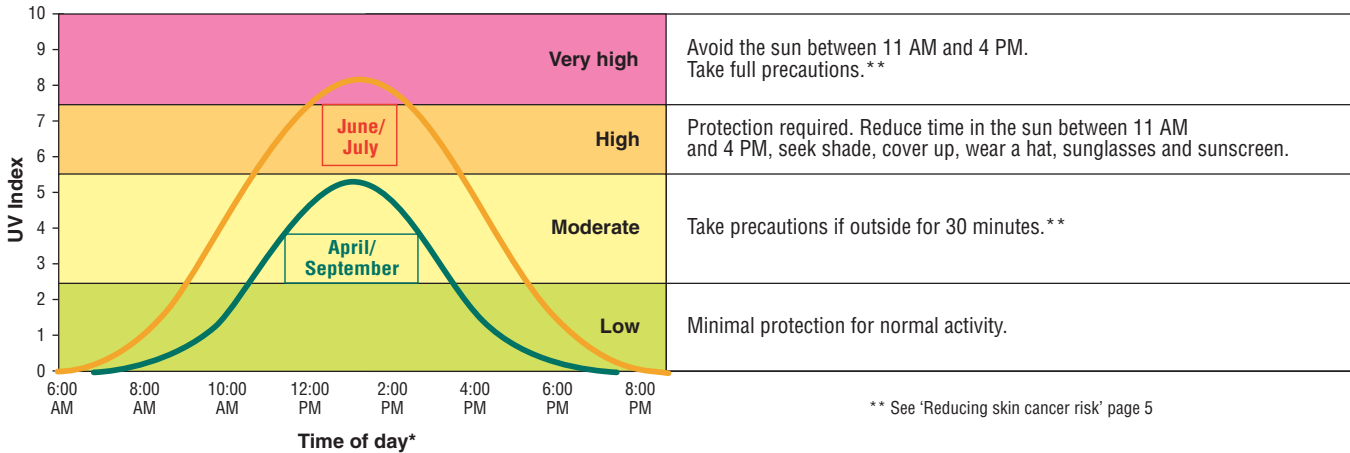
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The UV Index: Typical readings on sunny days in spring and summer, Southern Ontario

Sun protection actions based on the daily UV forecast**



** See 'Reducing skin cancer risk' page 5

*Eastern Daylight Saving Time
Source: Environment Canada/Environnement Canada

The UV index⁸

Environment Canada's UV Index forecast predicts the maximum daily strength of the sun's UVR. The higher the number, the stronger the sun's rays, and the more protection is required. The widely publicized UV Index provides Canadians with an important tool to assist them to change their behaviour as the UV Index rises. The UV Index forecast is available across Canada any day that the Index is expected to reach 3 or higher. Environment Canada's UV Index has been harmonized with the Index in other countries, allowing travellers to use the same system while abroad.

What is the impact of UVR

There is strong evidence that exposure to UVR from the sun and tanning equipment can result in harmful effects. These include skin and lip cancers, as well as precancers. UVR is also involved in the production of some types of cataracts.⁹

Skin cancer

Non-melanoma skin cancer (basal cell carcinoma and squamous cell carcinoma) is the most common of all cancers in Canada, accounting for about 1/3 of all newly diagnosed cancer cases. Its principal known cause is prolonged exposure to ultraviolet rays over many years. An estimated 68,000 cases of non-melanoma skin cancer will be diagnosed in Canada this year.¹⁰ Approximately 4,500 people will be diagnosed with melanoma, a very serious form of skin cancer. An estimated 30,000 Ontarians will be diagnosed with skin cancer each year, about 2,000 of them with melanoma.¹¹

8 Environment Canada 2004.

9 Ontario Cancer Fact: Sun Safety and vitamin D, Cancer Care Ontario, June 2006.

10 Canadian Cancer Society Statistics/National Cancer Institute of Canada: Canadian Cancer Statistics, Toronto, Canada, 2006.

11 CCO Fact Sheet. Cancer Care Ontario. Cancer Fact: Skin cancer is the most common cancer, June 2005.





Figure 1. Estimated new cancer cases, most common cancers Ontario, 2006¹²

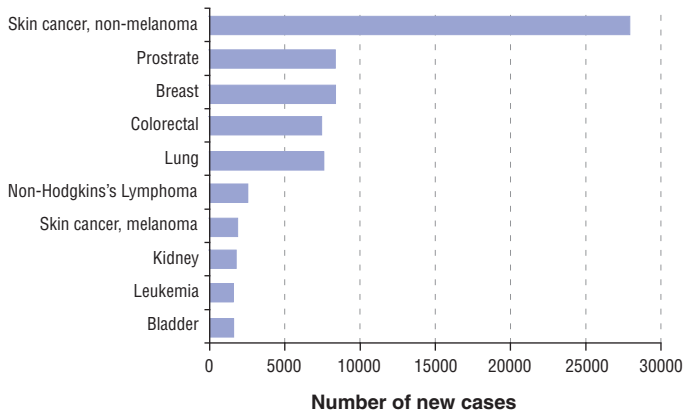
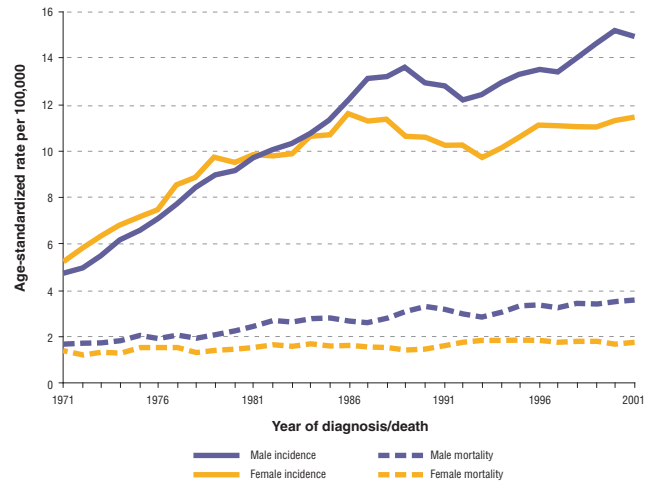


Figure 3. Melanoma incidence and mortality, Ontario 1971-2001¹⁶



The incidence rate for melanoma, has increased dramatically in Ontario since the 1960s.¹³ Over the decade 1992-2001, it remains one of the most rapidly increasing cancers in Canada, for both incidence and mortality.¹⁴

Figure 2: Average Annual Percentage Change in Age-Standardized Incidence rates 1992-2001 and Mortality Rates 1993-2002 for Melanoma, Canada¹⁵

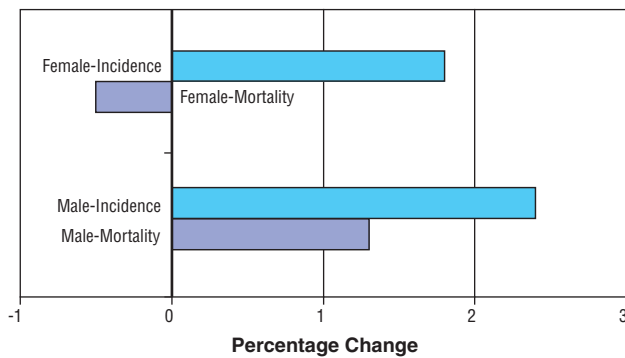


Figure 3 shows increases in the incidence and mortality rates for melanoma in Ontario over the past three decades. Of particular note is the significant increase in both incidence and mortality rates. In 1971, there were approximately 5 cases per 100,000 in men and women. By 2000 the rate had risen to 15 per 100,000 men and 11.5 per 100,000 women. Mortality rates have also been increasing slightly but steadily. Melanoma is the third most common form of cancer in young Canadians aged 20-39 years.¹⁷

12 Canadian Cancer Society Statistics/National Cancer Institute of Canada: Canadian Cancer Statistics, Toronto, Canada, 2006.

13 Ontario Cancer Fact: Are melanoma skin cancer rates increasing in Ontario, Cancer Care Ontario, May 2001.

14 Canadian Cancer Society Statistics/National Cancer Institute of Canada: Canadian Cancer Statistics, Toronto, Canada, 2006.

15 Ibid.

16 Cancer Care Ontario, Ontario Cancer Registry, 2004.

17 Canadian Strategy for Cancer Control, National Sun Safety Committee, Strategic directions for the primary prevention of skin cancer in Canada, December 2005.

Myths and realities about tanning¹⁸

There are many myths about tanning. These myths lend support to unhealthy behaviors related to UVR exposure both outdoor and indoor, increasing Ontarians' risk of developing skin cancer.

Myths/Realities	True or False	Reason
A base tan will protect you against sun burn and skin cancer	FALSE	A tan from natural or artificial sources will not protect you against skin cancer. Having a tan offers only the most minimal protection against sunburn and other sun damage.
Sunlight produces vitamin D in the skin	TRUE	Vitamin D can be obtained from a small amount of sun exposure, or from alternative sources such as food and vitamin supplements.
UVR damage to the skin is only temporary. By resting your skin between UVR exposures, the damage is erased	FALSE	Although the acute effects of a sunburn do go away and a tan does fade, UVR damage is cumulative because the skin has a limited capacity to repair itself, i.e. the damage (for instance to the DNA in skin cells) builds up.
Artificial tanning is safer than tanning outdoors	FALSE	There is no difference in the tan produced by the sun compared to that from tanning equipment. UVR exposure from either the sun or tanning equipment increases an individual's risk of developing skin cancer. In some cases, tanning equipment emits UVR up to 5 times as strong as the midday summer sun. ¹⁹
Skin cancer can be cured if found early	TRUE	Although non-melanoma skin cancer rarely results in deaths, many people end up with multiple skin cancers on different parts of their body; these can require extensive, potentially mutilating, surgery, and sometimes radiation to cure. Melanoma, on the other hand, can be fatal: more than 10% of those diagnosed with melanoma die within 5 years of diagnosis. However, melanomas that are found early have a good chance of cure. Look for these changes on your skin. <ul style="list-style-type: none"> • a change in a mole • a new growth on your skin • a sore that doesn't heal If you notice a change or are confused about what you should be looking for, ask your doctor or health care professional for help.
Some skin types such as olive or dark skin are completely protected against skin cancer	FALSE	Everyone needs to use SunSense. No skin type is completely protected against skin cancer, or signs of skin damage, such as wrinkling, but people with a fair or freckled complexion or skin that burns easily and doesn't tan are at higher risk.

¹⁸ www.cancer.ca.

¹⁹ Sinclair, C., *Artificial Tanning Sunbeds: Risks and Guidance*, World Health Organization, 2003.



Vitamin D

Skin exposure to UVB is the primary source of vitamin D, which is essential for good bone health. The Canadian Cancer Society, Health Canada and the scientific community corroborate the fact that one does not have to expose oneself to large amounts of UVB to get sufficient levels of vitamin D. There is still some debate about what the recommended blood level of vitamin D should be. For the majority of Canadians, incidental exposure to the sun through day-to-day activities (during non-peak sun hours), combined with normal dietary intake of vitamin D, provides adequate vitamin D in spring, summer and fall. Because UVB is weak in the Canadian winter sun, getting recommended levels of vitamin D through sun exposure is not possible during this time. In this case, and for those at increased risk of vitamin D deficiencies, supplementation is recommended.²⁰ Adequate vitamin D levels can be obtained through diet and supplementation alone. Individuals are advised to consult their doctor regarding their individual vitamin D requirements.²¹

Reducing skin cancer risk

The Canadian Cancer Society recommends the following SunSense Guidelines to assist Ontarians in reducing their risk of skin cancer:²²

- Protect yourself and your family particularly between 11 a.m. and 4 p.m. when the sun's rays are their strongest, or any time of the day when the UV Index is 3 or higher.
- Seek shade or create your own.
- Cover your skin with light, loose, but tightly woven clothing.
- Wear a broad brimmed hat.

- Use a broad spectrum (protects against UVA and UVB) sunscreen with a sun protection factor (SPF) 15 or SPF 30 if you work outdoors or if you will be outside for most of the day.
- Avoid using tanning equipment.

Tanning equipment

Artificial tanning equipment and skin cancer

Research shows that the risks of UVR exposure apply whether the UVR is from artificial tanning or sun exposure. In 2000, the U.S. Department of Health and Human Services concluded that ultraviolet radiation emitted by tanning equipment is carcinogenic.²³ A 2005 review of the scientific literature found a 25% increased risk of developing melanoma among those who had ever used artificial tanning equipment compared to those who never used the equipment.²⁴ People with the longest duration or highest frequency of use had a 61% greater risk of developing melanoma compared to never-users. Those who were first exposed to artificial tanning equipment as a young adult had a 69% increase in risk over those whose exposure occurred later in life. The study concluded that any use of artificial tanning devices elevates risk for melanoma.²⁵

Artificial tanning in Ontario

Usage

There is a lack of current information on the prevalence of tanning equipment use throughout Ontario. Data from 2004 is available for seven regions (Public Health Units) in the province—Hamilton; Haliburton, Kawartha,

20 Cancer Care Ontario. *Sun safety and vitamin D*, Ontario Cancer Facts, June 2006.

21 North American Conference on UV, Vitamin D and Health, the Canadian Cancer Society and National Cancer Institute of Canada, March 3, 2006

22 www.cancer.ca.

23 U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, *Report on Carcinogens, Eleventh Edition*, 2005.

24 Gallagher, R.P., Spinelli, J., Lee, T.K., "Tanning Beds, Sunlamps, and Risk of Cutaneous Malignant Melanoma," *Cancer Epidemiology Biomarkers & Prevention* 2005; 14(3): 562-566.

25 Ibid.

Pine Ridge; Sudbury; Middlesex-London; Perth; Niagara and Durham. In these regions, 7.2%-11.5% of adults age 18 and over report having used artificial tanning equipment in the past 12 months. Among people aged 18 to 34 years, use of tanning equipment ranges from 13.2% to 23.6%.²⁶ No Canadian data is available for youth under 18.

However, data from a 2005 U.S. study revealed that 9% of adolescent girls aged 14-17 years had used tanning equipment. Girls aged 14-17 years were seven times more likely to tan artificially than boys in the same age group. The use of indoor tanning devices increased with age from 14 to 17 years.²⁷

The tanning industry

We do not know the numbers, types or locations of tanning equipment in use in Ontario as there is no requirement for operators to report or register their equipment. We do know tanning equipment can be found in a variety of commercial locations in addition to tanning salons, including health and fitness clubs, beauty salons and spas, chain stores and private homes.

Existing regulation and guidelines in Canada and Ontario

The only regulation of tanning equipment that exists in Canada is Health Canada's Radiation Emitting Devices (RED) Act, which focuses on the equipment per se (i.e. at manufacturer's point of sale) and marketing practices, and does not include any aspect of use – such as who and how. The RED Act,²⁸ which was updated in 2005, does not apply to equipment in place prior to the Act and does not provide a clear mechanism for monitoring or enforcement.

Health Canada Radiation Emitting Devices (RED) Act (2005)

- Provides guidance re UVR outputs for tanning equipment at the time of sale only.
- Requires manufacturers to include new warning labels on equipment.
- Does not apply retroactively.
- Enforcement is minimal and reactive.

Health Canada has also produced *Guidelines for Tanning Salon Owners, Operators and Users*²⁹ outlining the risks of tanning, reviewing the RED Act, and providing tanning safety information. However, these guidelines are not mandatory and there does not appear to be a mechanism for dissemination, training or certification.

Risk of tanning for children and youth³⁰

Children require special protection from UVR exposure for the following reasons:

- Frequent sun exposure and sunburn in childhood and adolescence increases the risk of developing melanoma and basal cell carcinoma later in life.
- Children have more time to develop diseases with long latency, more years of life to be lost and more suffering to be endured as a result of impaired health. Increased life expectancy further adds to people's risk of developing skin cancers and cataracts.
- Children are more exposed to the sun. Much of a person's lifetime exposure to UVR is received before the age of 18.³¹

26 Institute for Social Research, York University, *Rapid Risk Factor Surveillance System (RRFSS) Study, Waves 37-48, 2004-2005*.

27 Morbidity and Mortality Weekly Report, Centre for Disease Control and Prevention, October 13, 2006/55(40):1101, Centre for Disease Control.

28 Radiation Emitting Devices Act, Health Canada, 2005.

29 Federal Provincial Territorial Radiation Protection Committee. *Guidelines for Tanning Salon Owners, Operators and Users*, 2005.

30 World Health Organization Fact Sheet #261, July 2001.

31 Federal Provincial Territorial Radiation Protection Committee (FPTRPC), "Solar and Artificial Ultraviolet Radiation: Health Effects and Protective Measures (Position Statement and Overview)," 1999.



For these reasons, it is particularly important that children (under 18 years of age) reduce their exposure to UVR.

Artificial Tanning Guidelines required

In March 2005, the World Health Organization (WHO) released recommendations that artificial tanning equipment not be used for cosmetic purposes and that therapeutic use of artificial tanning equipment be only under medical supervision. In addition, WHO recommends that artificial tanning equipment not be used by minors under the age of 18, or by individuals who have one or more characteristics that increase their risk of skin cancer from UVR exposure.³² The Canadian Cancer Society has adopted these positions of the World Health Organization.

Characteristics that increase skin cancer risk

- Have light-coloured skin, eyes and hair (particularly red hair);
- Have a tendency to freckle;
- Have many moles;
- Have a family history of skin cancer;
- Had several blistering sunburns as a child;
- Use certain drugs or cosmetics that make them more sensitive to UVR;
- Have had an organ transplant; and
- Take medications that suppress the immune system.

Ontarians should be concerned about artificial tanning use for the following reasons:

- Exposure to tanning equipment increases an individual's risk of developing skin damage which can lead to skin cancer, especially at a young age.
- There are limited controls governing artificial tanning, especially around who and how.
- The output of UVR from tanning equipment can be extremely high, often 5 times greater than the sun.³³

Policy recommendations

1. No person under the age of 18 should be permitted to use artificial tanning equipment.

As much as 60% of lifetime exposure to UVR takes place before the age of 18 years and use of tanning equipment by adolescents is increasing.³⁴ UVR exposure is an important risk factor for the development of skin cancer, and evidence suggests that risks may be higher for exposures occurring during childhood and adolescence.

2. Advertising for artificial tanning should not be permitted to target youth under the age of 18.

The tanning industry is growing and has been effective in promoting increased artificial tanning by young people. The current practice of allowing direct marketing to school-age youth, such as through schoolyard flyer drops and in yearbooks, promotes tanning as a normal, safe practice.

3. Training of all staff who operate artificial tanning equipment should be mandatory.

UVR, including that emanating from tanning equipment, is a known human carcinogen, causing

³² Sinclair, C., *Artificial Tanning Sunbeds: Risks and Guidance*, World Health Organization, 2003.
³³ Ibid.

³⁴ Federal Provincial Territorial Radiation Protection Committee (FPTRPC), "Solar and Artificial Ultraviolet Radiation: Health Effects and Protective Measures (Position Statement and Overview)," 1999.



skin cancer, as well as eye burns, cataracts and ocular melanoma. Furthermore, some members of the population are especially sensitive to UVR.

4. The Ontario government should implement and enforce legislation governing the artificial tanning industry.

Regulating artificial tanning is an important approach to prevent skin cancer and other health consequences related to UVR exposure. Regulations governing the artificial tanning industry should include mandatory training of all staff on how to operate and maintain the equipment, how to identify skin types and how to enforce the use of eye protection by customers. Tanning equipment is known to be available in a variety of commercial locations and regulations should encompass all venues.

5. As part of the review of the Ontario Mandatory Health Programs and Services Guidelines, the current guideline on reducing skin cancer incidence should be strengthened, including raising the need for a coordinated, comprehensive, provincial UVR (solar and artificial) safety strategy with dedicated resources and ongoing surveillance of tanning equipment use in young adults.

Other sources of Information

1. WHO guidelines: Sunbeds, tanning and UV exposure: <http://www.who.int/mediacentre/factsheets/fs287/en/>
2. WHO release: No person under 18 should use a sunbed: <http://www.who.int/mediacentre/news/notes/2005/np07/en/print.html>
3. WHO release: Ultraviolet radiation: solar radiation and human health: <http://www.who.int/mediacentre/factsheets/fs227/en/print.html>
4. The Canadian Cancer Society position on Youth and artificial tanning: http://www.cancer.ca/ccs/internet/standard/0,3182,3172_544556373__langl-en,00.html
5. Cancer Care Ontario. Sun safety and vitamin D: http://www.cancercare.on.ca/index_cancerfactssunsafety+vitamind.htm
6. Canadian Dermatology Association. Sun exposure and healthy levels of vitamin D: http://www.dermatology.ca/english/news/july-2005_e.html
7. Health Canada. Frequently Asked Questions on Radiation Emitting Devices: http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/tan-bronzage/faq-tan-bronzage_e.html
8. Sinclair, C., Risks and Benefits of Sun Exposure Position Statement: http://www.cancer.org.au/documents/Risks_Benefits_Sun_Exposure_MAR05.pdf

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Content prepared by staff of the Canadian Cancer Society - Ontario Division's Department of Cancer Control Policy and Programs:

- Danielle Paterson
- Patti Payne
- Rowena Pinto
- Sarah Smith

Content reviewed by:

Ontario Sun Safety Working Group members: Loraine Marrett, Cancer Care Ontario; Dave Broadhurst, Environment Canada; Lyn From, Women's College Hospital; Cheryl Rosen, University Health Network; Kaylene McKinnon, Middlesex-London Health Unit.
And by: Beth Theis, Cancer Care Ontario