



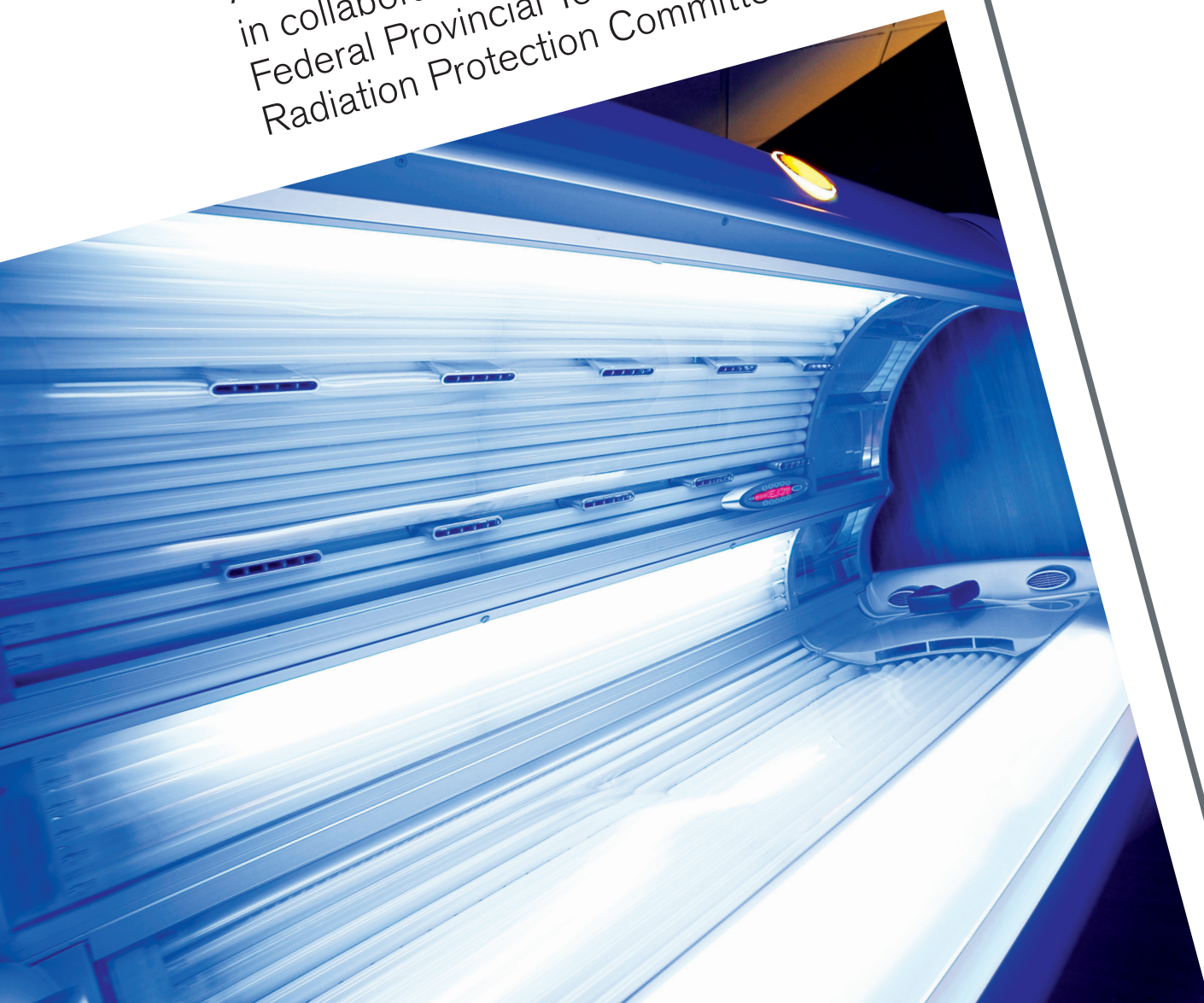
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# GUIDELINES FOR TANNING EQUIPMENT OWNERS, OPERATORS AND USERS

A Guideline published  
in collaboration with the  
Federal Provincial Territorial  
Radiation Protection Committee



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# FPTRPC POSITION STATEMENT ON ULTRAVIOLET RADIATION

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Whereas,

- There is sufficient scientific evidence demonstrating that excessive exposure to ultraviolet (UV) radiation, from sunlight or from artificial sources, causes acute and chronic adverse health effects;
- The main organs affected by UV radiation are the skin and the eyes;
- Exposure to solar and artificial UV radiation is widely recognized as an important, and preventable, cause of skin cancer;
- There is significant scientific evidence indicating that long-term exposure to UV radiation without adequate eye protection also plays a role in the development of some types of cataract and other eye and skin conditions;
- There is increasing evidence indicating that UV radiation also acts as a systemic immunosuppressor;
- Artificial sources of UV radiation can be found in work and recreation environments and the use of tanning equipment can add to the total dose of UV radiation absorbed by the body;
- The UV radiation dose to the population can be significantly decreased by applying simple strategies and measures to reduce exposures to the sun and artificial sources of UV radiation; and,
- The World Health Organization (WHO) has classified all UV radiation as a Class 1 carcinogen, which includes sunlight (1992) and tanning equipment (2009). The WHO does not recommend the use of UV tanning devices for cosmetic purposes.

The FPTRPC does not endorse UV radiation-induced tanning and recommends protective measures against excessive exposure to solar and artificial UV radiation, such as those contained in this document, be implemented by health, education, labour and recreation authorities in all provinces and territories and adopted by the general public. The FPTRPC further recommends that the use of tanning equipment, particularly by minors, be restricted.

# PREFACE

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There is no such thing as a safe or healthy tan as tanning results from the skin's natural defense response to damage caused by exposure to ultraviolet (UV) radiation. Exposure to UV A and B radiation can cause sunburn, premature skin ageing, skin cancers, cataracts and other eye and skin diseases. It has also been shown to weaken the body's immune system.

Individuals choosing to use tanning equipment (sunlamp or tanning bed) should be aware of the hazards and health risks involved so they can make informed decisions about the amount of exposure they receive.

This guideline is designed to give tanning equipment owners, operators and users a fundamental understanding of UV radiation and its effects on health. It outlines general guidelines in the context of the risks associated with tanning and provides information on certain cosmetic and medicinal products that increase UV effects.

Manufacturers, sellers, importers and distributors of tanning equipment have specific requirements for compliance under the federal *Radiation Emitting Devices Act* and the *Radiation Emitting Device Regulations (Tanning Equipment)*. For reference, sections 1 through 17 of the above mentioned Regulations are provided in Appendix A. Only tanning equipment that complies with the Regulations should be used for tanning purposes.

This document provides further guidance on tanning equipment usage, however it should not be considered sufficient on its own and should not be considered as an endorsement for the use of tanning equipment. Operators are required to take any additional measures necessary to minimize health hazards in their establishment. Additional information is available through regional public health authorities, or through members of the FPTRPC: [www.canada.ca/en/health-canada/services/environmental-workplace-health/radiation/federal-provincial-territorial-radiation-protection-committee.html](http://www.canada.ca/en/health-canada/services/environmental-workplace-health/radiation/federal-provincial-territorial-radiation-protection-committee.html)

This document supersedes the FPTRPC document *Guidelines for Tanning Salon Owners, Operators and Users* published in 2014.

# TANNING SAFETY GUIDELINES AND RECOMMENDATIONS

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Owners and operators of tanning equipment should be aware of and adhere to the requirements for tanning equipment as outlined under the *Radiation Emitting Devices Regulations (Tanning Equipment)* (Appendix A), and refer to them as needed. In addition, owners, operators and users of tanning equipment should follow the guidelines listed below which have been developed specifically for their adherence.

## General

1. Children under 18 years of age should not use tanning equipment. Depending on provincial or territorial regulations, a minor may have restricted access to tanning equipment.
2. All tanning equipment sold, resold, leased or imported into Canada must comply with the requirements specified for tanning equipment under the federal government's *Radiation Emitting Devices Regulations* (see Appendix A). Owners should check with their equipment supplier to ensure that tanning equipment and any associated apparatus being purchased and used by either themselves or by others, are in compliance with the Regulations.
3. Knowledgeable and trained tanning equipment operators or salon staff members should always be on the premises while tanning equipment is in use. Operators should be aware of skin typing and exposure procedures. Operators and users should be familiar with these guidelines and recommendations, as well as municipal and/or provincial/territorial public health and public safety regulations to inform and assist the public in the safer use of tanning equipment. Tanning salon operators should ensure that their employees receive adequate training including certification programs, where available, on the operation of tanning equipment.
4. Tanning equipment operators should ascertain a client's ability to tan (i.e. skin type), history of sunburns and skin cancer, history of skin infections, rashes or other skin conditions (e.g. open wounds or lesions) as well as any photosensitizing agents (see Appendix B) they may be using prior to or during the time of exposure.
5. Tanning salon operators should maintain client records. This information is to be used for exposure planning and to assist clients in understanding how the factors that impact one's ability to tan relate to UV radiation. Users and operators should follow the exposure schedules recommended by the manufacturer.
6. Users should avoid sunbathing and the use of tanning equipment on the same day. Users should also avoid the use of infrared saunas or warming beds for at least 24 hours following substantial sun exposures or tanning with artificial sources as it may increase the risk of developing skin cancer. Infrared radiation alone has been shown to induce erythema, skin pigmentation (in certain skin types) and skin photoaging, which can augment the harmful effects of UV radiation.



7. Individuals identified as Skin Type I (Always Burn, Never Tan) should not use UV-emitting tanning equipment. Those with light skin who can tan, but who burn easily and severely, are strongly discouraged from using tanning equipment, as they are most susceptible to sunburn among those who can develop a tan. Tanning equipment operators should inform prospective clients in this regard. Individuals with skin infections, rashes or other skin conditions should not use tanning equipment without first consulting a health care provider.
8. Prior to use of tanning equipment, the owner/operator of the tanning equipment should make users aware of the risks of tanning equipment including that a delayed, adverse reaction to UV exposure, such as red, irritated and watering eyes, an itching skin rash or sunburn may result. Delayed reactions can develop anywhere from minutes to a day and a half following exposure. In the event of a serious adverse reaction reported to the tanning establishment or owner/operator, the user should be advised to consult their health care provider. Upon receipt of notification of an adverse reaction, the owner/ operator should investigate the incident and implement modifications as necessary.

All such incidents should be documented and made available to an appropriate regulatory official on request. Where an injury to an individual is reported to the owner/operator by a duly qualified health care provider as a result of an exposure to the tanning equipment under the owner's control, the owner shall inform the relevant health authority. See Appendix C for a sample injury reporting template.
9. Tanning beds are to be operated/maintained by an onsite and trained operator as required by the province/territories. Self-serve unmanned machines are not to be used in a commercial environment. It is recommended that all equipment be controlled by remote timing devices.
10. It is recommended that tanning equipment users be informed of these guidelines and advised to consider discussing the risks of artificial tanning with their health care providers.

## UV Lamps (also referred to as UV Bulbs)

First and maximum exposure times per session recommended for skin types I through VI are dependent upon the strength and type of UV emissions from the lamps used in individual pieces of tanning equipment. Different models and brands of UV lamps produce varying intensities and emissions of UVA, UVB and small amounts of UVC radiation. Cases of overexposure and burns from UV radiation have occurred as a result of client exposure to tanning equipment where original lamps have been replaced with newer, more powerful lamps that do not comply with federal regulations.

11. Operators should ensure that replacement UV lamps function identical to the original bulbs supplied with the tanning equipment at the time of sale, lease or import so that the UVC irradiance (i.e.  $200 \leq \lambda < 260 \text{ nm}$ ) does not exceed a ratio of 0.003 of the UVB irradiance (i.e.  $260 \leq \lambda \leq 320 \text{ nm}$ )<sup>1</sup>. Modern tanning equipment should not emit UVC radiation or at least comply with the UVC/UVB ratio outlined in the *Radiation Emitting Devices Regulations (Tanning Equipment)* under Functioning Standards and comply with the UVC limits in the International Electrotechnical Commission (IEC) Standard 60335-2-27.

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<sup>1</sup> This information is to be provided by the equipment manufacturer and is based on the lamps provided with the original equipment at the time of sale.



12. Lamps in tanning equipment should never be replaced by lamps of different, often higher, levels of UVA and UVB. In order to avoid injury, replacement UV lamps must function so that maximum exposure time remains within plus or minus 10% of the maximum exposure time originally recommended by the manufacturer. When replacement lamps are identical to the original ones, the client can rely on the manufacturer's information provided with tanning equipment. As High Intensity Discharge (HID) lamps require special filters to block harmful portions of the UV spectrum, it is important to replace any cracked or damaged filters in order to prevent harm to the user.
13. The operator should ensure that:
  - a. The maximum exposure time recommended by the manufacturer is not increased to compensate for decreasing UV intensity as lamps age.
  - b. First and maximum exposure times comply with the manufacturer's recommendation. Owners, operators, and users should be made aware that every machine has its own number of lamps and irradiance spectrum (ratio between UVA and UVB), making the exposure schedule specific for each type of equipment.

## Protective Measures

14. UV radiation warning labels, compliant with the *Radiation Emitting Devices Regulations (Tanning Equipment)*, must be clearly visible on each piece of tanning equipment. Adherence to current labeling requirements, as specified in the *Radiation Emitting Devices Regulations*, is required for the sale, lease and importation of used tanning equipment with labels designed to warn users about UV radiation and its harmful effects on health. Labels should remain on the equipment as placed by the manufacturer. Provincial or territorial regulations for commercial tanning establishments may require the use of the latest federal warning label in some manner. Depending on provincial or territorial regulations, additional signage on equipment, doorways, or at point-of-sale may be required. A copy of these guidelines should be available within facilities or in the client reception area.
15. Each tanning device must have a control to allow the person being exposed to easily turn off the tanning equipment at any time without the need to disconnect the electrical plug or remove the UV lamp (as per the *Radiation Emitting Devices Regulations (Tanning Equipment)*).
16. The operator should provide each client/customer with UV radiation safety eyewear that meets or exceeds the requirements in the *Radiation Emitting Devices Regulations (Tanning Equipment)* and covers the eyes securely. Eyewear should be made available for purchase, with instructions given on proper use and fit, and the operator should check that clients have eyewear with them at every session.
17. Protective eyewear used with sunlamps or tanning equipment should meet three criteria. The eyewear should have a spectral transmittance that is:
  - not more than 0.001 over the wavelength range from 200 to 320 nm; and
  - not more than 0.01 over the wavelength range from 320 to 400 nm.

In addition, eyewear transmittance should be sufficient over wavelengths greater than 400 nm to enable the user to read the labels and use the controls mentioned in the requirements. According to the IEC Standard (IEC 60335-2-27, Edition 5.2, 2015-04; Table 101)<sup>2</sup> the maximum transmission of light with wavelengths between 400 to 500 nm should not exceed 5 percent in order to minimize retina damage due to extensive blue-light exposure.

18. A physical barrier, such as a clear UV-transmitting plexiglass cover, should always be in place between the lamps and the individual being exposed to UV radiation, covering the top and bottom sections of a two-part, hinged tanning bed or covering the side sections of a vertically mounted booth. A physical barrier constructed of acrylic is also acceptable if it prevents direct physical contact between the user and the UV lamps in a horizontal device. This barrier will prevent injury to the user of the equipment in case of accidental lamp breakage. It will also guard against thermal burns from close contact with the lamps.
19. It is recommended that tanning equipment owners follow manufacturers' repair and maintenance schedules to ensure devices are kept within manufacturers' specifications or the operational standards of the *Radiation Emitting Devices Regulations (Tanning Equipment)*. Tanning equipment should always be turned off during maintenance (e.g., changing UV lamps, cleaning equipment, etc.). In the event that the lamps must remain on, employees should use protective eyewear and clothing to minimize exposure.
20. Adequate ventilation should be provided such that the temperature of the tanning booth does not exceed 30°C.
21. Common contact surfaces, including protective eyewear, should be disinfected between each use, to prevent infection. Disinfectants should not leave films behind after use and the product used must state that it is an effective disinfectant against bacteria and viruses. The product must not damage the plastic in the protective eyewear or the plexiglass barrier. Tanning pillows should be replaced if the outer covering is compromised (i.e. cracked, ripped, split open exposing the inner foam which may encourage infection). Individuals may contact their Provincial/Territorial public health officials for further guidance: [www.canada.ca/en/health-canada/services/environmental-workplace-health/radiation/federal-provincial-territorial-radiation-protection-committee.html](http://www.canada.ca/en/health-canada/services/environmental-workplace-health/radiation/federal-provincial-territorial-radiation-protection-committee.html)

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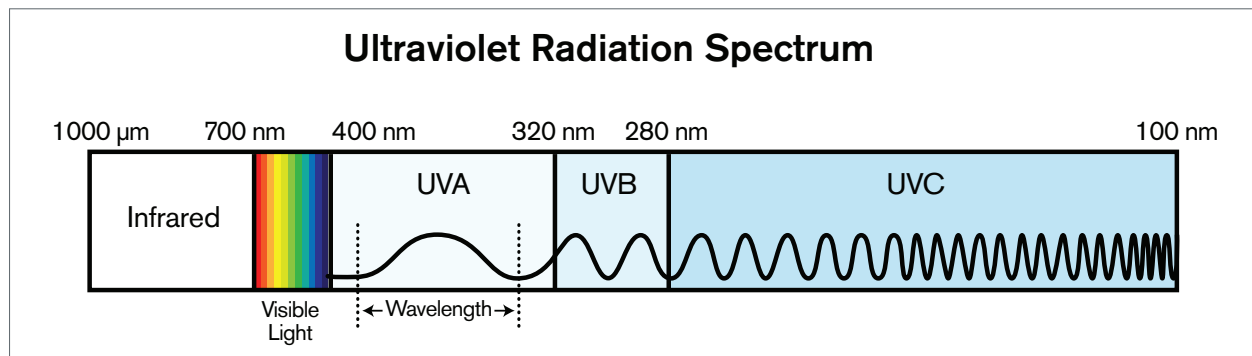
<sup>2</sup> Accurate at time of publication.

# WHAT IS UV RADIATION?

Optical radiation is part of the electromagnetic spectrum and a form of non-ionizing radiation that can exhibit properties of both waves and particles (photons). These may, as in the case of visible light, or may not, as in the case of ultraviolet or infrared light, be detectable by the human eye depending on their particular wavelength.

UV radiation is part of the invisible electromagnetic spectrum with wavelengths ranging from 400 to 100 nm (nm stands for nanometer which is one billionth of a meter). While UV radiation has a longer wavelength and less energy than X-rays, it has a shorter wavelength and is more energetic than visible light. The UV part of the spectrum is divided into three components; UVA, (400 to 320 nm), UVB, (320 to 280 nm) and UVC (280 to 100 nm). Depending on its wavelength, UV radiation may trigger different biological effects and will penetrate skin tissue to different degrees (more deeply in the case of UVA than UVB or UVC) (See Figure 1).

**FIGURE 1**



**UVA**—ultraviolet A radiation has a wavelength range of 320 to 400 nanometres which is closest to the “blue-end” of the light spectrum. UVA has to be 1000 times more intense than UVB to trigger the same erythema level, but UVA penetrates deeper into the dermis potentially causing damage to the underlying vascular system and dermal support structures. It is the most common radiation used in commercial tanning equipment and is responsible for the immediate darkening of the melanin already present in the skin. An intense exposure to UVA can result in burns in sensitive people. UVA rays can cause premature skin ageing due to their penetration in the dermis. Most tanning beds emit between 10–70 mW/cm<sup>2</sup> UVA, which is 2 to 14 times more than the sun at noon in the summer. Some high speed/high intensity tanners (e.g. facial) could emit even more UVA in some cases emitting greater than 30 times more than the Canadian summer sun.

**UVB**—ultraviolet B radiation has a wavelength range of 280 to 320 nanometres. UVB rays can penetrate the epidermis and are mostly responsible for sunburns (being 1000 times more erythemally effective than UVA) as well as for delayed tanning that appears within 2 or 3 days and lasts for a longer period of time. UVB is found at varying levels in all commercial types of tanning equipment. Always remember that the letter “B” in UVB reminds one of “burn”. Most tanning beds emit similar

levels of UVB to the noon-time summer sun however some pieces of tanning equipment can emit as much as 10 times more UVB radiation than others so they can cause serious burns in a very short period of time.

**UVC**—ultraviolet C radiation (100–280 nanometres) is hazardous to all forms of life, even with only very short exposures. UVC radiation from the sun is completely absorbed by the ozone layer in the higher atmosphere and never reaches the earth's level. Modern tanning equipment should not emit UVC radiation or at least comply to the UVC/UVB ratio dictated in the Regulations.

The sun is a major source of UV radiation, emitting mostly UVA and a small amount of UVB. Fortunately, the sun's emissions of the most energetic and harmful form of UV radiation, UVC, does not reach the Earth's surface. Other than natural sources, UV radiation can also come from a variety of different man-made products. Artificial sources may include certain lamps (e.g. incandescent, halogen, fluorescent, UV emitting LEDs etc.), UV curing devices, welding equipment, UV lasers, and tanning equipment.

Tanning equipment contains tanning lamps that emit mostly UVA radiation with a small amount of UVB. UV radiation from a tanning lamp is often generated within the fluorescent bulb by exciting the atoms of an inert gas with electricity. Portions of unwanted UV can be converted into visible light by having it transfer its energy into the phosphors deposited on the inside of the bulb. The percentage of UVA and UVB can vary from bulb to bulb depending on manufacture, operating temperature, wattage, and lamp age.

# TANNING LAMPS

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## Low Pressure Tanning Lamps

Low pressure fluorescent lamps are the most common in the tanning industry and can vary in size, length and UV output, emitting UVA and UVB, as well as visible light and some heat (infrared). The intensity of UV radiation from low pressure lamps can often exceed the sun's UV intensity several-fold, which is why exposure times in a tanning bed should be controlled by a knowledgeable or trained operator as required by the province/territories.

## High Pressure Tanning Lamps

High pressure lamps, also referred to as High Intensity Discharge (HID) lamps, are less common than low pressure fluorescent lamps and are relatively small in size in comparison. HID lamps produce UV radiation by means of an electric arc between tungsten electrodes within a quartz or alumina enclosure containing a pressurized gas with some metal salts. HID lamps emit considerably higher amounts of visible, UVA and UVB, than fluorescent lamps and also emit dangerous amounts of UVC radiation. As such, HID lamps require a filter during operation to prevent severe burning and skin damage. Typically, HID lamps are used for facial tanning and often have shorter exposure times due to their higher UV emissions. The manufacturer's exposure schedule should be adhered to when using HID lamps to prevent injury (see "Exposure Schedules" on page 14).

# SKIN AND THE UV-INDUCED TANNING PROCESS

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Skin is the largest organ of the body; its primary purpose is to protect the underlying tissues against harm from the environment (e.g. infection, toxins, physical injury, UV radiation, etc.) while maintaining the internal environment (e.g. temperature, humidity, etc.). Skin is comprised of two layers, the epidermis (outer layer) and the dermis (inner layer). The innermost section, or dermis, is formed of tissues containing nerves, blood vessels, lymphatics and fatty tissue. The outer layer, or epidermis, constitutes a series of layers. Skin cells, mostly consisting of keratinocytes, are created in the bottom or innermost layer of the epidermis. As cells age, they travel from the innermost layer of the epidermis to the outer surface of the skin where they die. The surface layer (or stratum corneum) forms a tough outer protective covering. As the cells move outward, they lose moisture, flatten and eventually flake off the surface of the skin in a process that takes approximately 28 days. It is the epidermis that is primarily involved in the tanning process.

## Skin Types

Knowledge of skin type is important when discussing tanning as tanning ability is dependent on skin type. Skin types are often described using the Fitzpatrick skin type classification system. This system helps to identify an individual's skin sensitivity to UV radiation based on that individual's natural skin colour. However photosensitivity is not only determined by constitutive skin pigmentation but is subject to other factors including genetic disposition for photosensitivity independent of skin colour, history of skin cancer, frequency of UV exposure, and use of agents (e.g. drugs, cosmetics etc.) that may increase one's photosensitivity (refer to Appendix B).

Fitzpatrick classification is grouped into 6 skin types, ranging from very fair (skin type I) to very dark (skin type VI), described as follows:

**Skin type I:** Always burns, never tans, extremely sensitive skin. This skin type is often found in people with red hair, fair to pale skin, freckles and blue eyes. People with this skin type should not use tanning equipment.

**Skin type II:** Usually burns, tans minimally. This skin type is often found in people with fair-haired, fair skin, and blue or hazel eyes.

**Skin type III:** May burn, tans well. This skin type is represented by the average Caucasian with fair skin.

**Skin type IV:** Rarely burns, tans well, and exhibits immediate pigment darkening. This skin type is often found in people with dark brown hair, naturally tinted or light brown pigmented skin, and dark coloured eyes.

**Skin type V:** Very rarely burns, tans easily and well, and exhibits immediate pigment darkening. This skin type is often found in people with dark brown hair, brown to dark pigmented skin, and dark coloured eyes.

**Skin type VI:** Very rarely burns, tans easily and well, and exhibits immediate pigment darkening. This skin type is often found in people with very dark hair, very dark skin, and dark coloured eyes.

Although subjective, Fitzpatrick skin type classification is used in artificial tanning to determine an individual's exposure schedule and maximum exposure time based on their skin's natural colour in order to avoid injury from burning or erythema (skin reddening) but still deliver a sufficient UV radiation dose necessary to develop and maintain a tan.

For this reason, the exposure schedule provided by the tanning equipment manufacturer takes into account exposure times, intervals between exposures and the degree of sensitivity for each skin type. The manufacturer recommended exposure times are weighed in accordance to the erythema reference action spectrum. The recommended exposure time of the first tanning session for untanned skin is based on an initial dose not exceeding 100 Joules per square metre ( $\text{J/m}^2$ ) to consider the more sensitive skin types and the recommended maximum exposure time is based on a dose not exceeding  $625 \text{ J/m}^2$ . The minimum interval between consecutive exposures and the maximum number of minutes of exposure per year based on a dose not exceeding 15 kilojoules per square metre ( $\text{kJ/m}^2$ ) can be found on a label affixed on the tanning equipment device.

It is the responsibility of the owner/operator of the tanning equipment to follow the manufacturer's exposure schedule by referring to the guide/label provided by the manufacturer for that particular tanning device to avoid injury.

## Tanning from Exposure to UV Radiation

A tan is a response to excessive UV radiation exposure which could create prolonged skin damage or skin cancer. Protection from a tan is limited and overexposure (sunburn) can occur. The user should be educated on the limitations of protection afforded by a tan.

There are two effects that occur in the skin following exposure to UV radiation. The first effect, immediate tanning or immediate pigment darkening (IPD), is a change in skin pigmentation which occurs immediately or shortly after exposure to UV radiation (primarily by UVA). This results from photo-oxidation and darkening of the melanin pigment present in the epidermis. This tan is only temporary and fades within 3 to 36 hours after exposure. A second process known as "delayed tanning" occurs in most individuals when the skin is exposed to UVB radiation, but not in people who lack the ability to produce sufficient amounts of melanin in the skin (i.e. Skin type I). An inability to tan increases the risk of skin cancer<sup>3</sup>, therefore individuals with Skin Type 1 should not use tanning equipment.

There are two processes involved in delayed tanning.

1. Melanocytes (skin cells capable of producing melanin pigment) are produced at the base of the epidermis with each melanocyte producing melanosomes containing the melanin pigment. These melanin containing units begin to spread throughout the layers of the skin as they work their way toward the keratinocytes at the surface of the skin. Melanin-containing cells cause the skin to appear darker in colour.

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<sup>3</sup> IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; v. 100D



2. The tough outer surface layer of dying skin cells thickens and absorbs more of the UVB radiation. This process serves as a protective mechanism in order to minimize further damage.

The above processes can take place over the course of a day and produce a noticeable tan within a few days that can last for weeks or months.

## Exposure Schedules

The exposure schedule is designed to allow a client to gradually build a tan, while minimising the risk of erythema. As per the Regulations, the initial dose must not to exceed  $100 \text{ J/m}^2$ , weighted according to the ISO 17166:1999 (CIE S 007/E:1998) erythema action spectrum, for the first exposure session for untanned skin, gradually increasing over the following sessions to a maximum of  $625 \text{ J/m}^2$  per session. The total amount of time (minutes) of exposure must not exceed the annual recommended dose of  $15 \text{ kJ/m}^2$ , weighted according to the CIE erythema action spectrum. The schedule is based on the skin type of the user and the output of UV-emitting lamps in the tanning unit. The exposure schedule displayed on the equipment provided by the equipment manufacturer should be followed for each particular product and skin type.

The recommended schedule within the international standard IEC 60335-2-27 Ed. 5.2 2015-04 follows that the initial dose should not exceed  $100 \text{ J/m}^2$  for untanned skin and that a waiting period of 48 hours should be respected between the first and second exposure to allow time to check for unexpected side effects. The recommended dose for the second exposure should not exceed  $250 \text{ J/m}^2$ . A single tanning course, consisting of a consecutive series of exposures, should not exceed a total dose of  $3 \text{ kJ/m}^2$ , weighted according to the erythema action spectrum, with the annual dose not exceeding  $15 \text{ kJ/m}^2$ . For more information regarding exposure scheduling, refer to the IEC 60335-2-27 Ed. 5.2 2015-04.

Furthermore, it is prudent to use gradual increments of approximately  $100 \text{ J/m}^2$  per week until a maximum of  $625 \text{ J/m}^2$  per session is reached. If any skin reddening (erythema) is visible 16–24 hours after any exposure, then further exposures should cease and may be continued the following week with the advice of a health care provider.

# RISKS OF UV-INDUCED TANNING

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Darkening of the skin (tanning) from exposure to UV is a biological response to UV radiation damage. Although UV radiation may provide some limited health benefits, including the treatment of certain skin conditions and specific autoimmune diseases, and help in the formation of vitamin D, the FPTRPC does not consider tanning a healthy activity. Whether from the sun or from tanning equipment, UV radiation can pose a risk to one's health.

Overexposure to UV has been linked to the following negative health outcomes:

- sunburns
- premature skin aging
- skin/eye cancer
- eye damage
- weakening of the immune system

The risks associated with UV-induced tanning outweigh the benefits as there is no clear threshold between positive and negative health effects and an individual's response is dependent upon a number of biological or physical variables which differ from person to person (e.g., skin type) and are subject to environmental conditions. Studies indicate that individuals who frequently tan are at greater risk of developing skin cancer later in life since the damage from UV exposure is cumulative and there is an escalating risk with total hours, sessions or years of tanning equipment use. Age of first use of tanning equipment is linked to an increased risk of developing melanoma and early onset of the disease.

Adverse health effects from overexposure to UV radiation include the following:

## Sunburn

Sunburn (or erythema) is an inflammatory redness of the skin caused by too much exposure to UV radiation, particularly UVB radiation. The small blood vessels in the skin dilate and increase blood flow to the skin's surface, resulting in redness and pain. The reaction can be almost immediate in severe cases, or may develop up to 24 hours later in less severe cases of overexposure. Delayed reactions, depending on the severity of the burn, include the skin shedding the upper layer of damaged skin and blistering. These responses to UV may render the skin more susceptible to infection. Individuals with open wounds or lesions are particularly sensitive to UV radiation as the protective epidermal layer is compromised. Studies indicate that people who have suffered severe and frequent sunburns during childhood are at greater risk of developing skin cancer later in life.

## Phototoxic and Photoallergic Reactions

A phototoxicity and photoallergy reaction is often an abnormal skin reaction to exposure from light or to UV radiation. Photoallergic reactions can manifest 24 to 72 hours following exposure to drugs and light/UV, often resulting in a rash resembling dermatitis. However, phototoxic reactions are more common and can occur rapidly following exposure, often resembling severe sunburn; the severity of which is dependent on the amount of the applied substance or photo-radiation. Examples of phototoxic and photoallergic reactions include, but are not limited to, hydroa vacciniforme, actinic prurigo, solar urticarial (solar 'hives' erythema), and polymorphic light eruption (allergic reaction to UV). Also, pre-existing conditions such as chronic actinic dermatosis, atopic eczema and psoriasis can be exacerbated by either solar or artificial UV radiation exposure. Individuals with lupus erythematosus, porphyria, or xeroderma pigmentosum are particularly sensitive and are encouraged not to use tanning equipment. Individuals who have the inability to tan or are deemed photosensitive should avoid tanning equipment. A number of drugs and/or cosmetics have also been shown to have phototoxic or photoallergic effects. The list of products that can cause photosensitivity is extensive and described in Appendix B.

## Premature Skin Aging

UV radiation causes actinic elastosis or premature ageing effects such as skin wrinkling, thinning of the skin, pigmentary change and loss of elasticity giving it a more leathery appearance. UV radiation can also cause the development of actinic keratoses which are scaly or crusty skin growths that resemble warts, often appearing on UV-exposed areas such as the face, scalp, lips, and the back of the hands. If left untreated, these growths may become cancerous.

## Skin Cancer

Skin cancer is the most common form of cancer in Canada. In 2016, there were an estimated 6,800 new cases of melanoma—the most deadly form of skin cancer. In the time period from 2010–2015, an average of 77,800 new cases of non-melanoma skin cancers per year were reported. More than ever, skin cancer seems to occur in younger individuals. Non-melanoma skin cancers, such as squamous and basal cell carcinomas, are most common, but rarely fatal, and in most cases, caused by UV exposure. Melanoma is a less common, but potentially deadly form of skin cancer. The main factors that predispose an individual to the development of melanoma include recreational exposure to either solar or artificial UV radiation, history of sunburn or history of skin cancer.

More information on Canadian cancer statistics is available at: [www.canada.ca/en/public-health/services/chronic-diseases/chronic-disease-facts-figures.html](http://www.canada.ca/en/public-health/services/chronic-diseases/chronic-disease-facts-figures.html)

### Non-melanoma skin cancer

Squamous Cell Carcinoma (SCC) is an uncontrolled growth of abnormal squamous cells, which comprise most of the skin's upper layers of the epidermis. SCC is not as common as Basal Cell Carcinoma but tends to be more aggressive since this type of skin cancer can spread to other parts

of the body if not treated promptly. SCCs are less harmful than melanoma and can be identified as elevated growths with a central depression, scaly red patches, open sores, or have a wart-like appearance that may easily bleed, crust or ulcerate. SCCs are most often found on areas on skin that are frequently exposed to the sun.

Basal Cell Carcinoma (BCC) is the most common form of non-melanoma skin cancer and the least fatal of all the skin cancers. Its appearance may be that of a red, pale or pearly colored round or flattened lump or scaly area that may form an ulcer with time. It tends to grow slowly, usually on areas on skin frequently exposed to the sun.

## Melanoma skin cancer

Melanoma which is comprised of cancerous melanocytes (cells containing the melanin pigment) is the third most common type of skin cancer, and the deadliest form. Exposure to UV radiation and heredity plays a role in the development of melanoma. There are four types melanoma:

- Superficial spreading melanoma, the most common form, typically stays within its area of origin before growing radially across the skin surface.
- Nodular melanoma, a more invasive form of melanoma, develops from superficial melanoma, growing downwards through the skin towards the basal layers.
- Lentigo maligna melanoma, a melanoma that has evolved from a lentigo maligna, typically presents on chronically sun damaged skin such as the face and the forearms of the elderly.
- Acral lentiginous melanoma, a type of lentiginous (a pigmented spot of melanocyte hyperplasia) skin melanoma, which although rare in Caucasians and people with lighter skin types, is the most common subtype in people with darker skins.

In 2009, international experts from the WHO International Agency for Research on Cancer (IARC), found significant evidence of an association between artificial tanning and the development of non-melanoma and melanoma skin cancer types. The IARC determined that the use of tanning equipment can increase the risk of developing cutaneous melanoma by 59% if first exposure occurs prior to 35 years of age<sup>4</sup>. The risk of developing skin cancer was also found to increase with cumulative exposure to UV radiation, i.e., there is an escalating risk with total hours, sessions or years of tanning equipment use. The WHO, IARC, the International Commission on Non-ionizing Radiation Protection (ICNIRP), and the Scientific Committee on Consumer Products (SCCP) to the European Commission have recommended that the use of tanning equipment should be avoided for children, adolescents and in individuals who have a diminished ability to tan. In light of scientific evidence, the WHO placed UV radiation emitting tanning equipment into its highest cancer risk category to a Group 1 ("carcinogenic to humans").

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<sup>4</sup> Boniol M, Autier P, Boyle P, Gandini S. Cutaneous melanoma attributable to sunbed use: systematic review and meta-analysis. British Medical Journal 2012; 345:e4757. Erratum correction: [www.bmj.com/content/345/bmj.e8503](http://www.bmj.com/content/345/bmj.e8503)

## Eye Problems

UV radiation may cause painful temporary injuries to the cornea and conjunctiva; called photokeratitis and photoconjunctivitis respectively. These conditions may develop two to twenty-four hours following exposure, with typical occurrence within six to twelve hours. UVA radiation may cause eye ageing effects, such as browning of the lens and its loss of elasticity with overexposure to UVB likely contributing to the appearance of cataracts in the lens. Repeated exposures can lead to the development of skin cancer around the eyes, pre-cancerous growths (e.g. pterygium) of the outer white part of the eye, conjunctival cancer or intraocular melanoma. Vision loss due to macular degeneration, while a risk factor, is predominantly caused by prolonged exposure to blue light in the visible spectrum, which is often a component of non-exclusive UV emitting sources. Proper use of eyewear when using tanning equipment will reduce risk of eye injuries.

## Weakened Immune System

Exposure to UV radiation weakens the immune system. UV-induced immunosuppression takes place both locally (i.e. skin) and systemically (i.e. the whole body), and has the potential to decrease the body's ability to defend itself against infection and serious illnesses, including skin cancer (i.e. non-melanoma and malignant melanoma) and other non-skin related types of cancer. The immunosuppressive nature of UV can be used to treat autoimmune diseases, for example, mycosis fungoides (also known as Alibert-Bazin syndrome or granuloma fungoides), a form of cutaneous T-cell lymphoma that can be treated with UV radiation exposure under controlled conditions. Similarly, phototherapy can be a treatment option for some types of eczema; an inflammatory skin condition.

## Appendix A

# *RADIATION EMITTING DEVICES ACT– RADIATION EMITTING DEVICES REGULATIONS (TANNING EQUIPMENT)*

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Extracts of the federal *Radiation Emitting Devices Act* and the federal *Radiation Emitting Devices Regulations (Tanning Equipment)*, Part XI of the *Radiation Emitting Devices Regulations*, in effect at the time of publication of this document, are shown below. Portions of the Act and the Regulations have been included here for convenience of reference only and do not have official sanction. In addition, the Act and the Regulations may be amended from time to time. For all purposes of interpreting and applying the law, users should consult the Regulations and the Act, as registered by the Clerk of the Privy Council and published in Part II of the *Canada Gazette*. Complete and current copies of the Regulations are available at [http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,\\_c.\\_1370/](http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1370/).

## Extract from the *Radiation Emitting Devices Act*, RSC 1985, c R-1, s 13(1)

### Regulations

13 (1) The Governor in Council may make regulations:

- (a) prescribing classes of radiation emitting devices for the purposes of this Act;
- (b) prescribing standards regulating the design, construction and functioning of any prescribed class of radiation emitting devices for the purpose of protecting individuals against genetic or personal injury, impairment of health or death from radiation;
- (c) exempting, with or without conditions, any radiation emitting device or class of radiation emitting device, including devices imported solely for the purpose of export, from the application of all or any of the provisions of this Act or the regulations;
- (d) respecting the labelling, packaging and advertising of radiation emitting devices, and the use of any material in the construction of any radiation emitting device, for the purpose of protecting individuals against genetic or personal injury, impairment of health or death from radiation;
- (e) prescribing the information that must be shown on any label or package and the manner in which that information must be shown;
- (f) requiring persons who manufacture, sell, lease, import into Canada or otherwise deal with any radiation emitting device to maintain such books and records as the Governor in Council considers necessary for the proper enforcement and administration of this Act;

- (g) prescribing the content of and the method of sending the notification required by subsection 6(1);
- (h) respecting the powers, duties and functions of inspectors and analysts;
- (h.1) respecting the seizure, taking away, detention, forfeiture and disposition of radiation emitting devices;
- (h.2) respecting the costs in relation to anything required or authorized under this Act;
- (h.3) respecting the implementation, in relation to radiation emitting devices, of international agreements that affect those devices;
- (h.4) prescribing anything that by this Act is to be prescribed; and
- (i) generally, for carrying out the purposes and provisions of this Act.

## Extract from the *Radiation Emitting Devices Act*, RSC 1985, c R-1, s 4

### **Sale, Lease and Importation**

4 Except as authorized by regulations made under paragraph 13(1)(c), no person shall sell, lease or import into Canada a radiation emitting device if the device:

- (a) does not comply with the standards, if any, prescribed under paragraph 13(1)(b) and applicable thereto; or
- (b) creates a risk to any individual of genetic or personal injury, impairment of health or death from radiation by reason of the fact that it:
  - (i) does not perform according to the performance characteristics claimed for it,
  - (ii) does not accomplish its claimed purpose, or
  - (iii) emits radiation that is not necessary in order for it to accomplish its claimed purpose.

## Extract from the *Radiation Emitting Devices Act*, RSC 1985, c R-1, s 5(1)

### **Deception**

5 (1) No person shall label, package or advertise a radiation emitting device in a manner that is false, misleading or deceptive or is likely to create an erroneous impression regarding its design, construction, performance, intended use, character, value, composition, merit or safety.



## Extract from the *Radiation Emitting Devices Act*, RSC 1985, c R-1, s 6

### Notification

#### Minister to be notified of non-compliance or defect

6 (1) Where a person who is the manufacturer or importer of a radiation emitting device becomes aware, after the device has left the person's premises, of the fact that the device:

(a) does not comply with the standards, if any, prescribed under paragraph 13(1)(b) and applicable thereto; or

(b) creates a risk to any individual of genetic or personal injury, impairment of health or death from radiation by reason of the fact that it:

(i) does not perform according to the performance characteristics claimed for it,

(ii) does not accomplish its claimed purpose, or

(iii) emits radiation that is not necessary in order for it to accomplish its claimed purpose, the person shall forthwith notify the Minister.

#### Minister may order notification

(2) Where the Minister determines,

(a) after being notified pursuant to subsection (1), or

(b) through the Minister's own investigation, research, inspection or testing, that a radiation emitting device falls under paragraph (1)(a) or (b), the manufacturer or importer of the device shall, if directed by the Minister, notify such persons as the Minister requires of the defect or non-compliance, by such method, giving such details and within such time period as are specified by the Minister.

## Extract of the *Radiation Emitting Devices Regulations*, CRC, c 1370, Schedule II, Part XI

### Tanning Equipment

#### Interpretation

1. The following definitions apply in this Part.

**double-contact medium screw lampholder** means a lampholder described in the International Electrotechnical Commission Standard IEC 60061-2, Edition 3.41, 2010-04, Sheet 7005-29-2, entitled *Position of holder thread in relation to the central and intermediate contacts of the lampholder E26d*, as amended from time to time. (douille à contact double pour vis moyenne)

**erythema reference action spectrum** means the erythema action spectrum set out in section 5.2 of the International Commission on Illumination Standard ISO 17166:1999(E) / CIE S 007/E-1998, First edition, entitled *Erythema Reference Action Spectrum and Standard Erythema Dose*, as amended from time to time. (spectre d'action érythémale de référence)

**exposure position** means any place, orientation or distance relative to the ultraviolet-radiating surface of tanning equipment at which it is recommended by the manufacturer that the user be exposed. (position pendant l'exposition)

**exposure scheduxle** means a program of exposure recommended by the manufacturer of tanning equipment that takes into account exposure times, intervals between exposures and the degree of sensitivity for each skin type. (programme d'expositions)

**irradiance** means radiant power incident per unit area, expressed in watts per square metre (W/m<sup>2</sup>). (éclairage énergétique)

**maximum exposure time** means the longest period for continuous exposure recommended by the manufacturer of tanning equipment. (durée maximale d'exposition)

**protective eyewear** means a device that is worn by the user of tanning equipment to reduce ultraviolet radiation reaching their eyes either directly or indirectly. (dispositif de protection des yeux)

**single-contact medium screw lampholder** means a lampholder described in the International Electrotechnical Commission Standard IEC 60061-2, Edition 3.41, 2010-04, Sheet 7005-21A-1, entitled *Lampholders E26*, as amended from time to time. (douille à contact unique pour vis moyenne)

**spectral irradiance** means the irradiance that results from radiation within an infinitesimally small wavelength range, expressed in watts per square metre per nanometre (W/m<sup>2</sup>/nm). (éclairage énergétique spectral)

**spectral transmittance** means the ratio of the spectral irradiance that is transmitted through protective eyewear to the spectral irradiance that is incident and normal to the surface of the eyewear. (transmittance spectrale)

**tanning equipment** means a device that  
(a) can be equipped with one or more ultraviolet lamps; and  
(b) induces skin tanning or other cosmetic effects.

It does not include any such device that is used in the production of therapeutic effects for medical purposes. (appareils de bronzage)

**timer** means a device that is capable of ending the emission of ultraviolet radiation from tanning equipment after a preset period. (minuterie)

**ultraviolet lamp** means a device that produces ultraviolet radiation in the wavelength range from 200 nm to 400 nm and is used in tanning equipment. (lampe à rayonnements ultraviolets)

**wavelength** means a wavelength as measured in air. (longueur d'onde)

## Information and Labelling

### General

2. The information and labels required by this Part must be provided in both official languages.

### Information

3. The following information must accompany each piece of tanning equipment:
  - (a) instructions for its operation and safe use that include
    - (i) detailed directions for determining the exposure positions,
    - (ii) the maximum exposure time,
    - (iii) the minimum interval between consecutive exposures recommended by the manufacturer,
    - (iv) the maximum number of persons who may, at the same time, be exposed to ultraviolet radiation from the tanning equipment, as recommended by the manufacturer, and
    - (v) the ultraviolet radiation warning labels described in section 5;
  - (b) instructions for obtaining repairs and the recommended replacement components and accessories that comply with the requirements of these regulations; and
  - (c) a warning to always follow the instructions that accompany the equipment so as to avoid injury.

### Labelling

4. Every piece of tanning equipment must have permanently affixed to its external surface the following information, clearly legible and readily accessible to view by the user immediately before use:
  - (a) the manufacturer's name and address;
  - (b) the model designation, serial number and month and year of manufacture;
  - (c) detailed directions for determining the exposure positions and a warning that the use of any other position may result in overexposure;
  - (d) the recommended exposure time, as calculated in seconds using the formula  $X / (\sum V_{\lambda} R_{\lambda})$  and converted into and expressed in minutes, where  
 $X$  is a dose not greater than 100 Joules/m<sup>2</sup> for the first exposure session for untanned skin, gradually increasing over the following sessions to a maximum of 625 Joules/m<sup>2</sup> per session,  
 $\lambda$  is the wavelength in nanometers,  
 $R_{\lambda}$  is the irradiance of the tanning equipment, measured at the minimum exposure distance, and  
 $V_{\lambda}$  is the weighting factor determined in accordance with the erythema reference action spectrum;
  - (e) the minimum interval between consecutive exposures;

(f) the maximum number of minutes of exposure per year, as recommended by the manufacturer based on a maximum annual dose of 15kJ/m<sup>2</sup> weighted in accordance with the erythema reference action spectrum and taking into account the recommended exposure schedule;

(g) the model designation for each type of ultraviolet lamp that is to be used in the tanning equipment; and

(h) the ultraviolet radiation warning labels designed in accordance with section 5.

5. The ultraviolet radiation warning must:

(a) be reproduced from the electronic file provided by the Minister;

(b) include in the French version of the label illustrated in Figure 1 of paragraph (e), enclosed within a black border,

(i) in the upper portion, on a white background, the signal word “Danger” in red with the hazard symbol to its right,

(ii) in the middle portion, the primary hazard statement “Les appareils de bronzage peuvent causer le cancer” in yellow on a black background,

(iii) in the lower left portion, the following statements in black on a white background and in the following order:

“L'exposition aux rayonnements ultraviolets (UV) peut avoir des effets nocifs sur la santé :”

“• La surexposition provoque des brûlures aux yeux et à la peau”

“• Les effets des UV sont cumulatifs et peuvent être cancérogènes—plus l'exposition régulière commence tôt, plus les risques qui y sont associés sont élevés”

“• Les facteurs de risque comprennent le type de peau, la photosensibilité et les antécédents de cancer de la peau”

“• Les médicaments et cosmétiques peuvent augmenter les effets des UV ”,

(iv) in the lower right portion, the following statements in black on a white background and in the following order:

“L'exposition aux UV peut contribuer, à long terme, au vieillissement prématuré et au cancer de la peau”

“• Suivre les instructions”

“• Porter un dispositif de protection des yeux”

“• Usage déconseillé aux personnes de moins de 18 ans”,

(v) in the lower left corner, the attribution “Santé Canada–Health Canada” on a white background, and

(vi) in the lower right corner, the attribution “Canada” on a white background;

(c) include in the English version of the label illustrated in Figure 2 of paragraph (e), enclosed within a black border:

(i) in the upper portion, on a white background, the signal word “Danger” in red with the hazard symbol to its right,

(ii) in the middle portion, the primary hazard statement “Tanning Equipment Can Cause Cancer” in yellow on a black background,

(iii) in the lower left portion, the following statements in black on a white background and in the following order:

“Ultraviolet (UV) radiation exposure can be hazardous to your health:”

“• Overexposure causes skin and eye burns”

“• UV effects are cumulative and may be carcinogenic—greater risks are associated with early and repeated exposure”

“• Risk factors include skin type, photosensitivity and history of skin cancer”

“• Drugs and cosmetics may increase UV effects”,

(iv) in the lower right portion, the following statements in black on a white background and in the following order:

“In the long term, UV exposure can contribute to premature ageing and skin cancer”

“• Follow instructions”

“• Use protective eyewear”

“• Not recommended for use by those under 18 years of age”,

(v) in the lower left corner, the attribution “Health Canada–Santé Canada” on a white background, and

(vi) in the lower right corner, the attribution “Canada” on a white background;

(d) measure:

(i) 75 mm high and 200 mm wide, in the case of tanning equipment used for full- or half-body exposure, and

(ii) 50 mm high and 100 mm wide, in any other case;

(d.1) be reproduced:

(i) in colours that are as close as possible to the colours in which they are set out in the electronic file referred to in paragraph (a), and

(ii) as clearly as possible taking into consideration the method of printing used; and

(e) conform to the following figures:

FIGURE 1

**Danger**

**Les appareils de bronzage peuvent causer le cancer**

L'exposition aux rayonnements ultraviolets (UV) peut avoir des effets nocifs sur la santé :

- La surexposition provoque des brûlures aux yeux et à la peau
- Les effets des UV sont cumulatifs et peuvent être cancérogènes — plus l'exposition régulière commence tôt, plus les risques qui y sont associés sont élevés
- Les facteurs de risque comprennent le type de peau, la photosensibilité et les antécédents de cancer de la peau
- Les médicaments et les cosmétiques peuvent augmenter les effets des UV

L'exposition aux UV peut contribuer, à long terme, au vieillissement prématuré et au cancer de la peau

- Suivre les instructions
- Porter un dispositif de protection des yeux
- Usage déconseillé aux personnes de moins de 18 ans

 Santé Canada Health Canada

**Canada**

FIGURE 2

**Danger**


**Tanning Equipment Can Cause Cancer**

Ultraviolet (UV) radiation exposure can be hazardous to your health:

- Overexposure causes skin and eye burns
- UV effects are cumulative and may be carcinogenic—greater risks are associated with early and repeated exposure
- Risk factors include skin type, photosensitivity and history of skin cancer
- Drugs and cosmetics may increase UV effects

In the long term, UV exposure can contribute to premature ageing and skin cancer

- Follow instructions
- Use protective eyewear
- Not recommended for use by those under 18 years of age

 Health Canada Santé Canada

**Canada**

6. (1) Subject to subsection (2), all advertising material in relation to tanning equipment must include the signal word “Danger” followed by the attribution “According to Health Canada / Selon Santé Canada”, the primary hazard statement “Tanning Equipment Can Cause Cancer / Les appareils de bronzage peuvent causer le cancer” and the statements set out in subparagraphs 5(b)(iii) and (iv) and 5(c)(iii) and (iv).

(2) Advertising material that is only English or French must include, in a clearly legible manner:

(a) if it is in only French, the signal word “Danger” followed by the attribution “Selon Santé Canada”, the primary hazard statement “Les appareils de bronzage peuvent causer le cancer” and the statements set out in subparagraphs 5(b)(iii) and (iv); and

(b) it is in only English, the signal word “Danger” followed by the attribution “According to Health Canada”, the primary hazard statement “Tanning Equipment Can Cause Cancer” and the statements set out in subparagraphs 5(c)(iii) and (iv).

7. Every ultraviolet lamp must have a tag, tape or card affixed to it that sets out:

(a) its model designation; and

(b) the warning “DANGER – Ultraviolet radiation. Follow instructions. Use only in fixtures equipped with a timer. / DANGER – Rayonnements ultraviolets. Suivre les instructions. À n'utiliser qu'avec un dispositif pourvu d'une minuterie.”

## **Construction Standards**

### **General**

8. All controls, meters, lights or other indicators of a piece of tanning equipment must be readily identifiable and clearly labelled to indicate their function.

### **Safety Features**

9. Every piece of tanning equipment must have the following safety features:

(a) a control by which the person being exposed may easily turn off the tanning equipment at any time without disconnecting the electrical plug or removing the ultraviolet lamps; and

(b) a timer that meets the functioning standards set out in section 16.

10. (1) Every piece of tanning equipment must have a physical barrier between the ultraviolet lamps and the user that prevents any direct physical contact between the user and the lamps.

(2) In the case of tanning beds, the physical barrier must be constructed of plexiglass or an equivalent material.



## Components and Accessories

11. Every ultraviolet lamp that is used in tanning equipment must be constructed so that it cannot be inserted and operated in a single-contact medium screw lampholder or a double-contact medium screw lampholder.
12. Every piece of tanning equipment must be accompanied by a number of sets of protective eyewear at least equal to the maximum number of persons who may, at the same time, be exposed to ultraviolet radiation from the tanning equipment, as recommended by the manufacturer of the equipment.

## Functioning Standards

13. Every piece of tanning equipment, whether it has its original components or replacement components recommended by the manufacturer, must, under the conditions of use specified by the manufacturer, meet the functioning standards set out in this Part.
14. Every ultraviolet lamp that is used in tanning equipment must function so that, at any distance and in any direction from the radiation source, the irradiance within the wavelength range from 200 nm to less than 260 nm does not exceed 0.003 of the irradiance within the wavelength range from 260 nm to 320 nm.
15. Every replacement ultraviolet lamp must function so that the maximum exposure time remains within 10% of the maximum exposure time originally recommended by the manufacturer.
16. The timer must:
  - (a) be adjustable to preset times and have a maximum timer setting not greater than the maximum exposure time recommended by the manufacturer;
  - (b) have a margin of error not greater than 10% of the maximum timer setting; and
  - (c) not automatically reset when the tanning equipment emissions have been ended by the timer.
17. Protective eyewear must have a spectral transmittance that is:
  - (a) not more than 0.001 over the wavelength range from 200 nm to 320 nm;
  - (b) not more than 0.01 over the wavelength range from 320 nm to 400 nm; and
  - (c) sufficient over wavelengths greater than 400 nm to enable the user to read the labels and use the control specified in paragraph 9(a).

# PRODUCTS THAT INCREASE SENSITIVITY TO ULTRAVIOLET RADIATION

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Many products, including prescribed medications, over-the-counter medicines, and a wide range of personal care products can increase the skin's sensitivity to UV radiation, also known as photosensitivity.

Photosensitivity can be caused by products applied directly to the skin or from medications or other substances that have been ingested. Examples include antidepressants, antibiotics, antihistamines, psoralens, antifungals, antidiabetic, oral contraceptives, tranquilizers, high blood pressure medications, and certain soaps or cosmetics.

## List of Photosensitizing Medications

The following list identifies medications and other agents that have been reported to cause photosensitivity reactions. However, it is provided for information purposes only, may not include all the photosensitive medications and may be subject to change. As there are hundreds of known photosensitizing agents under the following general categories, **individuals taking any medications or using any products (some listed below), should be advised to consult a health care provider or pharmacist before using tanning equipment.** Pharmaceutical manufacturer's package inserts should also be consulted regarding potential photosensitivity of medications.

\*An asterisk is shown next to a drug where photosensitive reactions are more likely to occur.

## Anti-cancer

Capecitabine

\*Dacarbazine

Dasatinib tyrosine kinase inhibitor

Farmorubicin

Fluorouracil (5-FU)

Flutamide

Imatinib

Mesna

Methotrexate

Paclitaxel

*Porphyrins and Metalloporphyrins:*

- Levulan
- Metvix
- Photofrin
- Visudyne and others

Tegafur-Uracil (UFT)

Vinblastine

## Anti-depressants

Amitriptyline	Maprotiline
Amoxapine	Nortriptyline
Citalopram	Paroxetine
Clomipramine	Phenelzine
Desipramine	Protriptyline
Doxepin	Sertraline
Escitalopram	Trazodone
Fluvoxamine	Trimipramine
Fluoxetine	Venlafaxine
Imipramine	

## Anti-histamines

Cetirizine	Isothipendyl
Cyproheptadine	Mequitazine
Dioxopromethazine	Trimeprazine
Diphenhydramine	

## Anti-hypertensives

Captopril	Minoxidil
Diltiazem	Nifedipine
Enalapril	Ramipril
Methyldopa	Valsartan

## Anti-inflammatory/anti-arthritis medications

Celecoxib	Indomethacin
Diclofenac	Ketoprofen
Diflunisal	Mesalazine
Hydrocortisone	Nabumetone
Ibuprofen	Naproxen

Phenylbutazone

\*Piroxicam

Sulindac

Tiaprofenic acid

## Anti-microbials

### *Fluoroquinolones:*

- Ciprofloxacin
- Fleroxacin
- Levofloxacin
- \*Lomefloxacin
- Moxifloxacin
- \*Nalidixic Acid
- Norfloxacin
- Ofloxacin
- Perfloxacin
- Sparfloxacin

### *\*Tetracyclines:*

- \*Demethylchlortetracycline
- \*Doxycycline
- Lymecycline
- Oxytetracycline
- Minocycline
- Tetracycline

### *Others:*

- Chloramphenicol
- Cotrimoxazole
- Dapsone
- Erythromycin
- Griseofulvin
- Hexachlorophene
- Pyrazinamide
- Sulfonamides
- Trimethoprim

## Anti-parasitic medications

Chloroquine

Halogenated salicylanilides

Ketoconazole

Quinine

\*Voriconazole

## Anti-psychotic medications

### *\*Phenothiazines:*

- \*Chlorpromazine
- Fluphenazine
- Perphenazine
- \*Prochlorperazine
- \*Promethazine
- \*Thioridazine
- Trifluoperazine

Flupentixol  
Haloperidol  
Olanzapine  
Thioxanthene

## Contraceptives, oral and Estrogens (birth control medication, female sex hormones)

Chlorotrianisene  
Diethylstilbestrol  
Estradiol  
Estrogens, conjugated and esterified

Ethinyl estradiol  
Medroxyprogesterone  
Megestrol  
Norethindrone acetate

## Diuretics

Acetazolamide  
Amiloride  
\*Chlorothiazide  
\*Furosemides

\*Hydrochlorothiazide  
Metolazone  
Triamterene

## Hypoglycemics and Anti-diabetics

Chlorpropamide  
Glibenclamide  
Sitagliptin

Sulfonylureas  
\*Tolbutamide

## Sunscreens

Avobenzone  
Benzophenones  
Cinnamates  
Homosalate

Oxybenzone  
\*PABA esters  
\*Para-aminobenzoic acid

## Others

Alprazolam

Amantadine

\*Amiodarone

Amlodipine

Atorvastatin

Azathioprine

Benzocaine

Benzoyl peroxide

\*Bergamot oil, oils of citron, lavender, lemon, lime, sandalwood, cedar (used in many perfumes and cosmetics; also topical exposure to citrus rind oils)

Carbamazepine

Chlordiazepoxide

Clofibrate

Clopidogrel

Coal tar

Desoximetasone

Disopyramide

Eculizumab

Efavirenz

*Epidermal Growth Factor  
receptor inhibitors:*

- Afatinib
- Cetuximab
- Erlotinib
- Gefitinib
- Lapatinib
- Panitumumab
- Vandetanib

\*Etretinate

Fenofibrate

Fluorescein

Gold Salts

Hydroxychloroquine

Hydroxyurea

Indapamide

Isoniazid

\*Isotretinoin

Itraconazole

Leflunomide

Methoxsalen

\*6-methylcoumarin (used in perfumes, shaving lotions and sunscreens)

\*Musk ambrette (used in perfumes)

Pravastatin

Phenytoin

Pirfenidone

\*Psoralens

Pyridoxine

Quinapril

Quinidine sulphate and gluconate

Ranitidine

Simvastatin

\*Tretinoin

Trioxsalen

Vemurafenib

# TANNING INJURY REPORT (SAMPLE)

TANNING INJURY REPORT			
<b>Tanning Facility Information</b>			
Name:		Address:	
Telephone:		City:	
		Province:	
		Postal Code:	
Operator on duty at time of injury:			
<b>Owner/Proprietor Information</b>			
Name:		Address:	
Telephone:		City:	
		Province:	
		Postal Code:	
<b>Tanning Equipment Information</b>			
Name of Manufacturer:	Model Number:	Serial Number:	Date of Manufacture:
Date of Purchase:		Name of Seller/Distributor:	
Type/Model of ultraviolet lamp(s) used in device:			
<b>Injury Information</b>			
Name of Injured Party (or parent of minor):		Address:	
Telephone:		City:	
		Province:	
		Postal Code:	
Date of injury:		Duration of UV Exposure:	
Name of attending physician, if applicable:			
Diagnosis/Treatment:			
Describe event/injuries (attach supplemental sheet if necessary):			
<b>Reporting Information</b>			
Date injury reported:		Name of Person taking Complaint:	
Corrective Action/Repairs made (including dates and person responsible):			

(Attach copy of patron's tanning record to this form)

A tanning facility should (a) report any injury, or any complaint of injury, to its regional health department within 5 days of the injury being reported, (b) send a copy of the injury report to the person who is injured or complains of an injury, and (c) send a copy to Health Canada (fax: 613-952-7584 or email: [ccrpb-pcrpcc@hc-sc.gc.ca](mailto:ccrpb-pcrpcc@hc-sc.gc.ca)).



# SOURCES AND EFFECTS OF ULTRAVIOLET RADIATION

Wavelength	UVC	UVB	UVA
	100–280 nm	280–320 nm	320–400 nm
Photon	more energetic		less energetic
Sources	<ul style="list-style-type: none"> <li>• Sun (negligible amount reaches the earth; absorbed by oxygen molecules, ozone and water vapour in the high atmosphere)</li> <li>• Germicidal lamps</li> <li>• Arc welding equipment</li> <li>• High intensity discharge (HID) lamps</li> <li>• Medical and industrial lasers</li> <li>• Fluorescent bulbs</li> </ul>	<ul style="list-style-type: none"> <li>• Sun (5% reaches the earth, wavelengths &gt;297 nm)</li> <li>• Germicidal lamps</li> <li>• Arc welding equipment</li> <li>• HID lamps</li> <li>• Phototherapeutic lamps</li> <li>• Medical and industrial lasers</li> <li>• Tanning equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Sun (most important part of natural UV radiation, at least 95%)</li> <li>• “Black light”</li> <li>• Germicidal lamps</li> <li>• Arc welding equipment</li> <li>• HID lamps</li> <li>• Phototherapeutic lamps</li> <li>• Tanning equipment</li> </ul>
Depth of Skin Penetration	<ul style="list-style-type: none"> <li>• Absorbed in the epidermis by keratin</li> <li>• Does not penetrate into the dermis</li> </ul>	<ul style="list-style-type: none"> <li>• Penetrates the basal layer of the skin</li> </ul>	<ul style="list-style-type: none"> <li>• Penetrates skin deeper than UVB and UVC</li> </ul>
Effects	<ul style="list-style-type: none"> <li>• Damage to cellular DNA: epithelium, cornea and bacteria</li> </ul>	<ul style="list-style-type: none"> <li>• Production of vitamin D<sub>3</sub> and delayed tanning Maximum acute and chronic biological effect</li> <li>• Sunburn, immuno-suppression, cellular damage, skin cancer, solar urticaria, premature skin ageing, photokeratoconjunctivitis, cataract, pterygium and solar retinitis</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate tanning</li> <li>• Promotes carcinogenic effects of UVB</li> <li>• Thermal burns</li> <li>• Sunburn, immuno-suppression, cellular damage, photoallergy, phototoxicity, premature skin ageing, photokeratoconjunctivitis cataract, pterygium and solar retinitis</li> </ul>

# GLOSSARY OF TERMS

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**Actinic elastosis**—also known as solar elastosis—a disorder associated with photoaging and refers to the accumulation of thickened malformed elastin fibers in the dermis in response to long-term exposure to UV radiation. The disorder is characterized by thickened, dry, rough, yellowish-colored, skin with deep creases and fine wrinkles.

**Actinic keratosis**—also known as solar keratosis which is often identified as rough, scaly elevated lesions (resembling a wart) caused by repeated exposure to the UV radiation from the sun and as a result can be often found on frequently sun exposed areas of the skin. If left unchecked, lesions may develop into skin cancer.

**Delayed tanning**—a type of tanning produced by UVB appearing a few days after exposure and lasting up to a few weeks. This process increases the number of melanocytes in the skin. At the same time, these melanocytes increase their production of melanin which then is oxidized giving the tanned appearance.

**Dermis**—lowest (innermost) layer of cells in the skin under the epidermis.

**Epidermis**—outer layers of skin in which melanin is found, and where tanning occurs.

**Erythema**—the medical term for inflammatory redness of the skin. It is the result of an exposure to UV radiation, particularly UVB. It is commonly called “sunburn”.

**Fitzpatrick skin type**—A skin type classification system based on one’s natural skin colour (I-VI) that is used to determine tanning ability or photosensitivity. Originally designed for phototherapy to reduce the risk of sunburns/overexposure during treatment.

**Immediate tanning**—also known as immediate pigment darkening (IPD)—a photo-oxidation process (mainly triggered by UVA) that causes rapid darkening of the melanin pigment already present in the skin with the change in pigmentation often lasting only for a short time (hours to days).

**MED—Minimum Erythmal Dose**—a measure of the accumulated erythemally weighted UV energy that would cause the first perceptible sign of reddening (i.e., erythema). The energy-equivalent depends on the skin type. For the most sensitive skin types, 1 MED is approximately 2 SED. For skin type II 1 MED is approximately 2.5 SED.

**Melanin**—a pigment that responsible for the color of our skin, hair, and eyes. Darker skin is associated with higher levels of melanin. Melanin is an effective absorber and scatterer of light, providing some protection to skin cells from UV radiation.

**Melanogenesis**—the production of melanin by cells called melanocytes. In the skin, melanogenesis occurs after exposure to UV radiation, causing the skin to visibly tan.

**Melanoma**—also known as Cutaneous Malignant Melanoma (CMM—the most serious (potentially fatal) but rarest form of skin cancer that occurs in melanocytes (pigment containing cells in the skin).

**Non-Melanoma Skin Cancer (NMSC)**—the most common type of skin cancer that occurs in either basal or squamous cells. Of the two types of non-melanoma skin cancers, Basal Cell Carcinoma (BCC) is the most common often occurring on frequently sun exposed areas of the body and develops in the cells lining the bottom of the epidermis near the dermis. Squamous Cell Carcinoma (SCC) develops in the cells lining the top of the epidermis and is also commonly found on frequently exposed areas of the skin but can spread to other parts of the body.

**Photokeratitis** and **photoconjunctivitis**—painful injuries to the cornea (the clear front window of the eye that covers the iris and pupil) and conjunctiva (a thin transparent membrane that covers white part of the eye) respectively, caused by overexposure to UV radiation that can be avoided by wearing protective eyewear.

**Photosensitivity**—a person's biological sensitivity or reactivity to visible light or UV radiation.

**Pterygium**—a benign growth of the conjunctiva that can invade the cornea which can affect vision.

**SED**—Standard Erythema Dose is a measure of the accumulated erythemally-weighted UV energy, where  $1 \text{ SED} = 100 \text{ J/m}^2$ .

**Stratum corneum**—tough outer layer of dead skin cells.

**Ultraviolet (UV) radiation**—defined as the part of the non-ionizing invisible electromagnetic spectrum which ranges from 400 nm to 100 nm. Tanning occurs as a result of exposure to UV radiation.