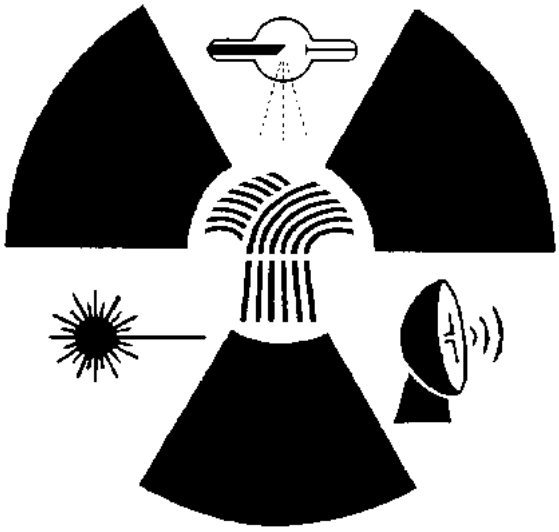
GUIDELINES
FOR
TANNING SALON
OWNERS & OPERATORS



Report RSU 117/OT/0406

Occupational Health and Safety Division
Radiation Safety Unit
400 - 1870 Albert Street
Regina, Canada
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April 16, 2006

Guidelines for Tanning Salon Operators

Radiation Safety Unit
Occupational Health and Safety Division
Saskatchewan Labour
April 2006

This set of guidelines is an adaptation of tanning salon guidelines prepared by the British Columbia Ministry of Health. We wish to thank our British Columbia counterparts on the Personal Services Establishment Committee and in the Radiation Protection Branch for the many hours of research, review and consultation they put into preparing the British Columbia Guidelines for Tanning Salon Operators.

Introduction

Prolonged exposure to Ultraviolet (UV) A and B radiation can cause sunburn, premature skin aging, skin cancers, cataracts and other eye and skin diseases. It has also been shown that UV can suppress the body's immune system.

Skin cancers in Saskatchewan are quite prevalent. In 2004, there were 2615 skin cancers (comprised of 1826 basal cell carcinoma, 644 squamous cell carcinoma, 105 malignant melanoma and 40 other) reported to the Saskatchewan Cancer Agency. In Canada, 2004, more than 76,000 new cases of skin cancer were diagnosed. One in seven of today's children is expected to develop some form of skin cancer in his or her lifetime. Evidence indicates that 85 per cent or more of all skin cancers are caused by exposure to UV radiation.

When a person chooses to acquire or enhance a tan using a tanning facility, it is important for that person to be aware of the hazards involved so they can make an informed decision about the amount of exposure they receive. This booklet is designed to give owners and staff of tanning salons a fundamental understanding of ultraviolet radiation and its effects on people. It discusses the risks of tanning, provides information on certain products that increase that risk, and a list of general guidelines for tanning salon personnel. The final section contains a series of questions and answers for tanning salon personnel to test their knowledge and understanding of the information in this booklet.

Public Health Officials, owners and operators may refer to this document, *The Radiation Health and Safety Regulations, 2005* and to the Department of Health's *Guideline for Personal Service Facilities* when assessing whether a tanning salon is being operated in accordance with the proper procedures. However, following the guidelines listed in this document does not relieve the operator from the obligation to take any additional measures necessary to minimize health hazards in their establishment. Operators are also responsible for ensuring that they are conducting business in compliance with municipal and other regulatory requirements, and for obtaining business licences and/or operating permits from the appropriate licensing authorities.

These guidelines were reviewed by the province's Radiation Health and Safety Committee.

Saskatchewan Labour welcomes written comments and/or suggestions on these guidelines, and will take any such feedback into consideration in future revisions. Comments should be addressed to the Radiation Safety Unit, Occupational Health & Safety Division, Saskatchewan Labour, 400 - 1870 Albert Street, Regina, Saskatchewan, S4P 4W1.

Glossary of Terms

Delayed tanning- tanning process resulting in an increase in the amount of melanin pigment produced in the skin.

Dermis - lowest (innermost) layer of cells in the skin. Also called –Corium.

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 can be produced by exposure to ultraviolet radiation, particularly UVB radiation. When this happens, it is commonly called “sunburn”.

Immediate pigment darkening - tanning process that darkens only the melanin pigment already present in the skin.

Melanin - pigment in the skin which becomes darker when exposed to ultraviolet radiation.

Melanoma - most serious form of skin cancer.

Photokeratitis and photoconjunctivitis - painful injuries to the cornea and conjunctiva caused by overexposure to ultraviolet radiation.

Stratum corneum - tough outer layer of dying skin cells.

UVA - ultraviolet radiation (sometimes called "long wave" radiation - 320 to 400 nanometres) most common in commercial tanning equipment.

UVB - ultraviolet radiation (sometimes called "short wave" radiation - 280 to 320 nanometres) responsible for most sunburns as well as long lasting tans. VB is found at varying levels in all commercial tanning devices.

UVC - ultraviolet radiation (100 - 280 nanometres) is very dangerous to all forms of life, even with only very short exposures. UVC radiation from the sun is completely absorbed by the earth's atmosphere. Modern tanning equipment does not emit UVC radiation.

UV Radiation - ultraviolet radiation - is electromagnetic radiation of the same nature as visible light, but having shorter wavelengths and higher energies. The wavelength range of 100 to 400 nanometres includes the entire spectrum of ultraviolet radiation.

Risks of Tanning

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 the blood flow to the skin's surface, making it red and painful. This reaction can be almost immediate in severe cases, or may develop up to 24 hours later in less severe cases of overexposure.

Some people with fair skin are genetically incapable of producing sufficient melanin in their bodies to allow tanning. They usually burn, whether in the sun or when using tanning equipment.

Premature Aging

Ultraviolet radiation causes premature aging effects such as skin wrinkling and hardening of the skin. Overexposure to UV radiation can also make the skin more fragile and vulnerable to damage.

Skin Cancer

Skin cancer is the most common form of cancer in Canada. In 2004, there were more than 76,000 new cases of this increasingly prevalent skin disease. In Saskatchewan, in 2004, there were 2615 skin cancers (comprised of 1826 basal cell carcinoma, 644 squamous cell carcinoma, 105 malignant melanoma and 40 other) reported to the Saskatchewan Cancer Agency. One in seven of today's children will develop skin cancer during their lifetime.

Squamous and basal cell cancers are the most common, but rarely fatal, forms of skin cancer. Exposure to UV radiation can cause these forms of cancer.

Malignant melanoma is a less common, but potentially deadly, type of skin cancer. Melanoma has been linked to intense intermittent and long-term exposure to ultraviolet radiation during childhood or the teenage years.

The risk of developing skin cancer increases as total exposure to UV radiation increases. People with fair skin who burn easily are also more at risk of developing skin cancer.

Eye Problems

Ultraviolet radiation may cause painful temporary injuries to the cornea and conjunctiva called photokeratitis and photoconjunctivitis. These injuries - normally caused by too much UVB or UVC radiation - are more commonly known as 'welder's flash' or 'snow blindness'. These conditions may develop from 2 to 24 hours after exposure, but usually occur within 6 to 12 hours. UVA radiation may cause eye aging effects, such as browning of the lens and loss of elasticity. Overexposure to UVB can cause cataracts in the lens. Some people have also reported retina damage due to too much UV radiation.

Tanning Safety Guidelines

Owners/operators of tanning salons must be aware of and adhere to the pertinent regulations in *The Radiation Health and Safety Regulations, 2005* (see Appendix E). Owners/operators of *tanning salons* should also refer to the Department of Health publication: *Guidelines for Personal Service Facilities* available from local Health District Offices. These guidelines describe the minimum health standards required of Personal Service Facilities. In addition, tanning salon operators should follow the guidelines listed below.

It is recommended that tanning clients be advised to consider discussing the risks of artificial tanning with their family physicians.

GUIDELINES

1. All tanning equipment must comply with the appropriate regulations under Health Canada's Radiation Emitting Devices (RED) Act as per the tanning salon requirements in Sections 23 & 24 of *The Radiation Health and Safety Regulations, 2005* (Appendix E). Operators must check with their equipment supplier to ensure that sunlamps, tanning beds and any associated apparatus being purchased are in compliance with the RED Act.
2. Knowledgeable operators or staff members who can inform and assist the public in the safe use of tanning devices should always be available during business hours. Staff should be familiar with these guidelines, and have completed the questionnaire at the back of this booklet.
3. It is recommended that tanning salon operators ascertain a client's ability to tan, history of sunburns, history of skin infections, rashes or other conditions, use of certain medications or cosmetics and keep records of the same. This information is to be used in exposure planning and client education.
4. People who always burn and never tan should be advised not to use tanning equipment. People who do not tan easily (for example, fair-skinned adults with red or blond hair and freckles) should receive lower (shorter) exposures than customers with dark skin and dark hair. Anyone who has a skin infection, rash or other skin condition should not use tanning equipment until the problem is resolved or a doctor has been consulted.
5. It is recommended that persons under the age of 18 should NOT be allowed to use tanning equipment without parental consent.
6. Operators should ensure that clients are informed about factors which could adversely affect their tolerance to ultraviolet radiation exposure. This should include information about both oral and topical medications and cosmetics or lotions applied to the skin. For further information see Appendix D.
7. Know your UV light bulbs:

   First and maximum exposure times for different skin types depend on the strength and type of ultraviolet emissions from the light bulbs used in each individual piece of tanning equipment. There are many different models and brands of ultraviolet light bulbs available on the market, producing varying intensities and emitting different amounts of UVA and UVB radiation.

While all pieces of tanning equipment are required to carry specific information about maximum exposure times and minimum intervals between exposures, this information is based on the bulbs provided with the original equipment. It is not uncommon for replacement bulbs installed in tanning equipment by operators to have different - and often higher - levels of ultraviolet emissions than the original bulbs. Cases of overexposure to UV radiation have occurred as a result of clients being exposed to tanning equipment which has had its original bulbs replaced with newer, more powerful bulbs.

For this reason, it is essential that operators ensure that clients are informed as to the maximum exposure time (in minutes) and the minimum time interval needed between consecutive exposures for the particular make and model of bulbs that are actually installed in each separate tanning machine.

Operators should endeavour to ensure that replacement bulbs identical to the original bulbs supplied with the tanning device are used. When replacement bulbs identical to the original bulbs are used, the manufacturer’s information on the exterior of the tanning device will apply. However, if the replacement bulbs are not the same type as those installed with the original equipment, the manufacturer's information may not be correct and maximum allowable exposure times may differ from the manufacturer's information. In this case the owner/operator must update the information on the exterior of the tanning device and advise clients of the change.

Please note also that:

(a) Maximum exposure time cannot be increased to compensate for decreasing UV intensity as bulbs age; and

(b) Different beds have different maximum exposure times. A client accustomed to tanning on a bed with a high proportion of UVA radiation must be advised that they cannot have a similar exposure time on a UVA tanning bed with a higher proportion of UVB radiation.

8. Ensure that ultraviolet radiation warning labels, in conformity to The Radiation Health and Safety Regulations, 2005, are posted in plain view and easily readable at all tanning locations within the facility, and in the client reception area as well.

9. Ensure that each tanning device can be easily turned off by the person who is being exposed, without their having to disconnect the electrical plug or remove the ultraviolet lamp (a requirement of The Radiation Health & Safety Regulations, 2005).

10. Ensure that each client/customer is provided with - and instructed on how to wear - ultraviolet radiation safety eyewear which cover the eyes securely.

    Protective eyewear used with tanning equipment must meet the following criteria. The eyewear must have a spectral transmission that is:

    1) not more than 0.001 over the short wavelength range from 200 to 320 nm;
    2) not more than 0.01 over the long wavelength range from 320 to 400 nm; and
    3) sufficient over wavelengths greater than 400 nm to enable the user to see through them, clearly enough to read the labels and operate the controls.

    A list of some eyewear that meets these specifications is included in Appendix C. For

additional information on eyewear contact the Radiation Safety Unit, Saskatchewan Labour, 400 - 1870 Albert Street, Regina, Saskatchewan (306) 787-4538.

11. Ensure that a physical barrier (i.e., a clear UV-transmitting acrylic cover) is in place between the lamps and the person being exposed to UV radiation, covering the top section of two part or hinged tanning beds as well as over the bottom section. 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 bulbs.

12. Whenever maintenance is being performed on any tanning equipment (e.g., changing UV bulbs, cleaning equipment, etc.) ensure that employees either turn off all the tanning bulbs while working on or around the equipment, or else wear protective eyewear and clothing to minimize their exposure and protect against potential damage to their eyes and skin

13. Ensure that adequate ventilation is provided in such a way that the temperature of the tanning booth/room does not exceed 30°C.

14. Clients should be advised that they may have a delayed, adverse reaction to UV exposure (e.g., red, irritated and watering eyes or an itching skin rash or sunburn) after they leave the tanning salon. This delayed reaction can take anywhere from less than an hour to as long as a day and a half to develop. If a serious adverse reaction results, they should be advised to consult their doctor. They should also be asked to notify the tanning salon operator of their reaction. Upon receipt of notification of an adverse reaction, the owner/operator should investigate the incident and implement whatever changes the investigation may indicate are needed.

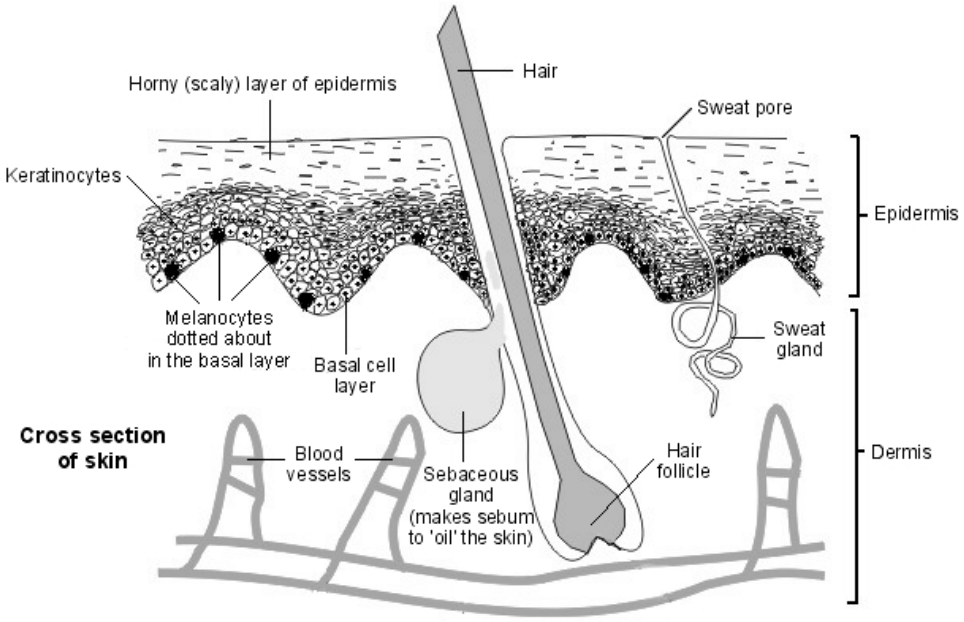
    All such incidents shall be documented and these documents shall be available to an officer on request. Where an injury to a person is reported to the owner/operator by a duly qualified medical practitioner as an injury that is known or suspected to have been caused or exacerbated by exposure of the person to the tanning equipment under the owner's control, the owner shall inform the department immediately.

15. Infection control:

    Ensure that common contact surfaces, including protective eyewear, are disinfected between each use, with a low level disinfectant. Refer to the Department of Health's Guideline *for Personal Service Facilities*, regarding the importance of proper hand washing, and the use and care of critical items, including sterilization of equipment and disposal of wastes.

Appendix A - The Tanning Process

Skin is made up of basically two layers, the epidermis (outer layer) and the dermis (corium or inner layer). The innermost section or dermis is formed of tissues containing nerves, blood vessels, lymphatics and fatty tissue. The outer layer or epidermis is made up of a series of layers. Cells are created in the bottom or innermost layer of the epidermis. As cells age, they travel from the innermost layer of the epidermis, through the middle layers, out toward the surface of the skin where they die. This 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. This process takes about 28 days.



Tanning

There are two effects that occur in the skin following exposure to UV radiation. When the skin is exposed to ultraviolet radiation, a slight immediate pigment darkening or immediate tanning is sometimes observable. It is believed this results from darkening of the melanin pigment that is already present in the epidermis as it absorbs and filters out some of the damaging UV radiation. This tan is only temporary, and fades within 3 to 36 hours after exposure. This type of tan is strongly stimulated by UVA radiation.

A second process known as "delayed tanning" occurs in some individuals when the skin is exposed to ultraviolet radiation. This process causes two responses. First, more melanocytes (skin cells capable of producing melanin pigment) are produced at the base of the epidermis, and each melanocyte produces more melanin pigment. These melanin containing cells begin to distribute themselves throughout the layers of the skin, as they work their way toward the surface of the skin. This greater presence of melanin-containing cells causes the skin to appear darker in colour. Second, the tough outer or surface layer of dying skin cells thickens and absorbs more of the hazardous shortwave UVB radiation, thereby increasing protection to the inner living skin tissue from the harmful rays. This second takes one or more days to happen, and produces a noticeable tan within a few days that can last for weeks or even months.

Appendix B

Forms of Radiation

Ultraviolet (UV) Radiation is a form of electromagnetic energy with wavelengths ranging from 100 to 400 nanometres. These wavelengths can be divided into UVA (wavelength 320 to 400 nanometres), UVB (wavelength 280 to 320 nanometres) and UVC radiation (100 to 280 nanometres).

UVA (wavelength 320 to 400 nanometres, sometimes known as “black light” or "longwave" radiation) carries less energy than UVB and UVC, although UVA penetrates more deeply into the skin and underlying tissues. UVA is about 1,000 times more effective than UVB in producing an immediate tanning effect, by causing the melanin in the epidermis to darken immediately (i.e., as soon as the skin is exposed). Intense, prolonged exposure to UVA can burn sensitive skin. Prolonged UVA exposure can damage underlying structures in the corium and cause premature aging of the skin.

UVB (wavelength 280 to 320 nanometres, sometimes called "shortwave” or "erythemal" UV radiation) carries more energy than the longer wave UVA radiation, although it does not penetrate as deeply into the skin as UVA. UVB is 1,000 times more likely to cause sunburn (erythema) than UVA. Exposure to UVB causes a delayed tanning effect - that it takes two or three days for the tan to appear. Repeated exposure to UVB radiation also causes skin thickening with a longer lasting tan. Various factors (including skin type, length of exposure, and genetic background) may influence how a person will react to exposure to UV radiation. To help you remember that UVB is 1,000 times more able to cause sunburn than UVA, remember: "B" is for "Burn".

UVC (wavelength 100 to 280 nanometres, sometimes called "germicidal" UV radiation) is very dangerous to all forms of life, even with only very short exposures. Fortunately, UVC radiation from the sun is completely absorbed by the earth's atmosphere, and does not reach the surface of the earth. Modern tanning equipment does not emit UVC radiation.

Most tanning equipment produce from 7 to 20 mW/cm^2 (milliwatts per square centimetre) of UVA. That's three to eight times more UVA than the sun produces at midday during summer months. Face tanners generally emit much more UVA than tanning beds.

All tanning equipment also emit varying amounts of UVB. The amount of UVB emitted varies with each lamp. Even tanning lamps labelled 'Only UVA' still emit some UVB. Some lamps may emit ten times more UVB than others, causing significant sunburn in a short time, even to people who have previously used tanning lamps.

	Radiation Type		Health Effects
	Long Waves		
	900 nm		
		Invisible Infrared (IR) Radiation	Lower energy radiation, no photochemical damage mechanism.
	800 nm		
	700 nm		
	600 nm		
		Visible light	
	500 nm		
	400 nm		
Invisible Ultraviolet Radiation		UVA	Radiation may cause skin cancers. UVB in particular can cause severe burning.
	300 nm		
		UVB	
	200 nm		Used for sterilizing water, germicidal, etc.
		UVC	
	100 nm		Higher energy radiation, such as x-rays and gamma rays. Also a health risk.
	Short Waves		

SOURCES AND EFFECTS OF ULTRAVIOLET RADIATION *

UV-C	**UV-B**	**UV-A**
Wavelength: 100-280 nm Higher energy per photon.	**Wavelength:** 280-320 nm Intermediate energy per photon.	**Wavelength:** 320-400 nm Lower energy per photon
Sources: - Sun (UV-C is absorbed by molecular oxygen, ozone and water vapour in the upper atmosphere) - Germicidal lamps - Arc welding equipment - High intensity discharge lamps (HIDL)	**Sources:** - Sun (5% of UVR at ground level, only wavelengths > 297 nm) - Germicidal lamps - Arc welding equipment - HIDL - Therapeutics lamps - Medical and industrial lasers	**Sources:** - Sun (95% of UVR at ground level) - Black light lamps - Germicidal lamps - Arc welding equipment - HIDL - Therapeutics lamps - **Tanning devices (sunbeds)**
Penetration: - Photons between 100 to 200 nm are absorbed in air. - Absorbed by keratine in the epidermis, does not penetrates to the dermis.	**Penetration:** - Partially absorbed by ozone in the upper atmosphere - Penetrates to the dermis	**Penetration:** - Not absorbed by ozone - Penetrates deeper into the skin than any other form of UVR.
Effects: - DNA effects for unprotected cells: epithelium, cornea and bacteria.	**Effects:** - Responsible for vitamin D_3 production and delayed tanning. - Most effective in causing acute and chronic harmful effects. - Sunburn, immuno-suppression, cellular damage, skin cancer, solar urticary, photo-ageing and, photokerato-conjunctivitis, cataract, and pterygium.	**Effects:** - Causes immediate tanning. - Can potentiate some carcinogenic effects of UVB. - Thermal burns - Sunburn, immuno-suppression, cellular damage, photoallergy, phototoxicity, photo-ageing, photokerato-conjunctivitis, cataract and pterygium, solar retinitis?

* Table is taken from the Federal Provincial Territorial Radiation Protection Committee's Position Statement and Overview on Solar and Artificial Ultraviolet Radiation: Health Effects And Protection Measures

Appendix C

Protective Eyewear for Sunlamps

Protective eyewear used with tanning equipment like tanning beds must meet the following three criteria. The eyewear must have a spectral transmission that is:

1) not more than 0.001 over the short wavelength range from 200 to 320 nm;

2) not more than 0.01 over the long wavelength range from 320 to 400 nm; and

3) sufficient over wavelengths greater than 400 nm to enable the user to see through them, clearly enough to read the labels and operate the controls.

The following eyewear products have been tested by the British Columbia Radiation Protection Service and found to meet the criteria above:

a) Super Sunnies, Lucas Products Corporation, U.S.A.

b) Le String, Irex100, by Bolle, France

c) Eurotan Blinkers, eye Pro Inc., U.S.A.

d) Wink Ease

e) Ultra Eyes

f) Ten Stuck Sonnan Clip

g) Peepers, 1992 California SunCare, Inc.

h) Hytique EyeLids

i) Sun-clipse, Apollo's St. Louis, Missouri

j) Australian Gold, distr by ETS, Inc.

k) SunGlobes, World Suncare Products Corp.

The following do not meet the criteria above:

a) Cool Eyes Inc. (does not meet criterion #1)

Appendix D

Products that Increase the Risk

Many products, including prescribed medications, over-the-counter patent medicines, and a wide range of personal care products can increase the skin's sensitivity to UV radiation. This can result in photosensitivity, an intense reaction of the skin to ultraviolet radiation which can cause burning (or erythema) in a much shorter time period than would normally be expected.

Photosensitivity can be caused by products applied directly to the skin or from medications or other substances that have been ingested.

The article below, which lists a number of agents that may cause photosensitivity reactions, is taken from *The Medical Letter on Drugs & Therapeutics*, Vol. 37, Issue 946, April 14, 1995, and reprinted with permission.

Because there are literally hundreds of known photosensitizing agents under these general categories, clients taking any medications or using any of the other products listed below should be advised to consult a physician or pharmacist before tanning,

DRUGS THAT CAUSE PHOTOSENSITIVITY*

As the weather becomes warmer, physicians may see more photosensitivity reactions due to systemic or topical drugs, perfumes, cosmetics or sunscreens (JE Allen, *Clin Pharm*, 12:580, 1993; TS Potter and K Hashimoto, *Compr Ther*, 20:414, 1994). Even brief exposure to sunlight in warm or cold weather can cause intense cutaneous reactions in patients with drug-induced photosensitivity, and some patients may continue to be sensitive to sunlight long after stopping use of the offending agent.

The table that follows lists some drugs and other agents that have been reported to cause photosensitivity reactions. Those marked with an asterisk are more frequent causes of reactions. Phototoxic drugs used for therapeutic purposes such as the psoralens trioxsalen (Trisoralen) and methoxsalen (Oxsoralen), used for vitiligo and psoriasis, and coal tar (Zetar, and others), used for psoriasis, are not included.

SOME AGENTS THAT MAY CAUSE PHOTOSENSITIVITY REACTIONS

ANTICANCER DRUGS

Dacarbazine (*DTIC-Dome*)
Fluorouracil (*Fluoroplex,* and others)
Flutamide (*Eulexin*)
Methotrexate (*Folex,* and others)
Vinblastine (*Velban,* and others)

*Reactions occur more frequently

**The Medical Letter* • Vol. 37 (issue 946) April 14, 1995

ANTIDEPRESSANTS

Amitriptyline (*Elavil,* and others)
Amoxapine (*Asendin,* and others)
Clomipramine (*Anafranil*)
Desipramine (*Norpramin,* and others)
Doxepin (*Adapin,* and others)
Imipramine (*Tofranil,* and others).
Maprotiline (*Ludiomil,* and others)
Nortriptyline (*Aventyl,* and others)
Phenelzine (*Nardil*)
Protriptyline (*Vivactil*)
Trazodone (*Desyrel,* and others)
Trimipramine (*Surmonti)*

ANTIHISTAMINES
Cyproheptadine (*Periactin*, and others)
Diphenhydramine (*Benadryl*, and others)

ANTIHYPERTENSIVES
Captopril (*Capoten*)
Diltiazem (*Cardizem*, and others)
Methyldopa (*Aldomet*, and others)
Minoxidil (*Loniten*, and others)
Nifedipine (*Procerdia*, and others)

ANTIMICROBIALS
Ciprofloxacin (*Cipro*)
Clofazimine (*Lamprene*)
Dapsone (generic)
*Demeclocycline (*Declomycin*, and others)
*Doxycycline (*Vibramycin*, and others)
Enoxacin (*Penetrex*)
Flucytosine ((*Ancobon*)
Griseofulvin (*Fulvicin-U/F*, and others)
*Lomefloxacin (*Maxaquin*)
Minocycline (*Minocin*, and others)
*Nalidixic acid (*NegGram*, and others)
Norfloxacin (*Noroxin*)
Ofloxacin (*Floxin*)
Oxytetracycline (*Terramycin)*
Pyrazinamide (generic)
Sulfonamides
Tetracycline (*Achromycin* and others)
Trimethoprim (*Proloprim*, and others)

ANTIPARASITIC DRUGS
Chloroquine (*Aralen*, and others)
Quinine (many manufacturers)
Thiabendazole (*Mintezol*)

ANTIPSYCHOTIC DRUGS
Chlorpromazine (*Thorazine*, and others)
Fluphenazine (*Permitil*, and others)
Haloperidol (*Haldol*, and others)
Perphenazine (*Trilafon*, and others)
*Prochlorperazine (*Compazine*, and others)
Thioridazine (*Mellaril*, and others)
Thiothizene (*Navane* and others)
Trifluoperazine (*Stelazine*, and others)
Triflupromazine (*Vesprin*)

DIURETICS
Acetazolamide (*Diamox*, and others)
Amiloride (*Midamor*, and others)
Bendroflumethiazide (*Naturetin*, and others)
Benzthiazide *(Exna)*
*Chlorothiazide (*Diuril*, and others)
*Furosamides (*Lasix*, and others)
*Hydrochlorothiazide (*HydroDIURIL*, and others)
Hydroflumethiazide (*Diucardin, Saluron*)
Methyclothiazide (*Aquatensen*, and others)
Metolazone (*Mykrox, Zaroxolyn*)
Polythiazide (*Renese*)
Triamterene (*Dyrenium*)
Trichlormethiazide *(Metahydrin, and* others)

HYPOGLYCEMICS
Acetohexamide (*Dymelor*)
Chlorpropamide (*Diabinese*, and others)
Glipizide (*Glucotrol*, and others)
Glyburide (*DiaBeta*, and others)
Tolazamide (*Tolinase*, and others)
*Tolbutamide (*Orinase*, and others)

NONSTEROIDAL ANTI-INFLAMMATORY DRUGS
Diflunisal (*Dolobid*)
IbuProfen (*Motrin*, and others)
Indomethacin (*Indocin*, and others)
Ketoprofen (*Orudis*, and others)
Nabumetone (*Relafen*)
Naproxen (*Naprosyn*, and others)
Phenylbutazone (*Butazolidin*, and others)
*Piroxicam (*Feldene*, and others)
Sulindac (*Clinoril*, and others)

SUNSCREENS

*Aminobenzoic acid (PABA - 405 Solar Cream)
Avobenzone (*Photoplex;* Shade UVAGuard)
*Benzophonones (*Bain de Soleil; Solbar*, and others)
Cinnamates (*Bull Frog; Coppertone*, and others)
Homosalate (*Coppertone: Tropical Blend, and* others)
Menthyl anthranilate (*Hawaiian Tropic, Neutrogena*, and others)
*PABA esters (*Tropical Blend, Presun*, and others)

OTHERS
Alprazolam (*Xanax,* and others)
Amantadine (*Symmetrel*, and others)
*Amiodarone (*Cordarone)*
Benzocaine (many manufacturers)
Benzoyl peroxide (*Oxy 10*, and others)
*Bergamot oil, oils of citron, lavender, lime, sandalwood, cedar (used In many perfumes and cosmetics); also topical exposure to citrus rind oils)
Carbamazepine (*Tegretol*, and others)
Chlordiazepoxide (*Librium*, and others)
Clofibrate (*Atromid-S,* and others)
Contraceptives, oral
Desoximetasone (*Topicort*, and others)
Disopyramide (*Norpace*, and others)
Etretinate (*Tegison*)
Fluorescein (*Fluorescite*, and others)
Gold Salts (*Myochrysine*, and others)
Hexachlorophene, (*pHisoHax*, and others)
Isotretinoin (*Accutane*)
*6-methylcoumarin (used in perfumes, shaving lotions and sunscreens)
*Musk ambrette (used in perfumes)
*Promethazine (*Phenergan*, and others)
Quinidine sulphate and gluconate (many manufacturers)
Tretinoin (*Retin-A*)
Trimeprazine (*Temaril*)

Appendix E

The Radiation Health and Safety Regulations, 2005

Commercial tanning salons – safety features

23 An owner of a commercial tanning salon must ensure that each tanning enclosure is designed, constructed and maintained in accordance with *Radiation Emitting Devices Regulations* (Canada), Part XI, Tanning equipment.

Shields for tanning equipment

24 The owner of a commercial tanning salon must ensure that each tanning enclosure is designed with shields or other means to prevent the user from coming into direct contact with the ultraviolet lamp.

THE RADIATION EMITTING DEVICES REGULATIONS (TANNING EQUIPMENT)

PART XI

TANNING EQUIPMENT

Interpretation

1. The following definitions apply in this Part.

"double-contact medium screw lampholder" means a lampholder described in *American National Standard for Lampholders for Electric Lamps*, ANSI C81.62-1991, Standard Sheet 2-158-1, entitled *Double-Contact Medium Screw Lampholder*, published by the American National Standards Institute and approved on July 15, 1991. (*douille à contact double pour vis moyenne*)

"erythema reference action spectrum" means the erythema action spectrum set out in section 5.2 of CIE Standard CIE S 007/E-1998 entitled *Erythema Reference Action Spectrum and Standard Erythema Dose*, published in 1998 by the Commission internationale de l'éclairage. (*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 schedule" 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^2). (*éclairement 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 the ultraviolet radiation reaching their eyes either directly or indirectly. (*dispositif de protection des yeux*)

"single-contact medium screw lampholder" means a lampholder described in *American National Standard for Lampholders for Electric Lamps*, ANSI C81.62-1991, Standard Sheet 2-157-1, entitled *Single-Contact Medium Screw Lampholder*, published by the American National Standards Institute and approved on July 15, 1991. (*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 ($W/m^2/nm$). (*éclairement 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. (*appareil 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

$$X / (\Sigma V_\lambda R_\lambda)$$

and converted into and expressed in minutes, where

X is a dose not greater than 100 J/m^2 for the first exposure session for untanned skin, gradually increasing over the following sessions to a maximum of 625 J/m^2 per session,

λ is the wavelength in nanometers,

R_λ is the irradiance of the tanning equipment, measured at the minimum exposure distance, and

V_λ 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 15 kJ/m^2, 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 labels 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 "Rayonnements ultraviolets" in yellow on a black background, and

(iii) in the lower portion, the following message in black on a white background:

"La surexposition provoque des brûlures aux yeux et à la peau. Porter le dispositif de protection des yeux. Suivre les instructions. Médicaments et cosmétiques peuvent augmenter les effets des UV. L'exposition aux UV peut avoir des effets nocifs sur la santé et contribuer, à long terme, au vieillissement prématuré et au cancer de la peau. Ces effets sont cumulatifs. Plus l'exposition régulière commence tôt, plus les risques qui y sont associés sont élevés.";

(*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 "Ultraviolet Radiation" in yellow on a black background, and

(iii) in the lower portion, the following message in black on a white background:

"Overexposure causes skin and eye burns. Use protective eyewear. Follow instructions. Drugs and cosmetics may increase UV effects. UV exposure can be hazardous to your health and in the long term can contribute to premature skin ageing and skin cancer. UV effects are cumulative. Greater risks are associated with early and repeated exposure.";

(*d*) measure

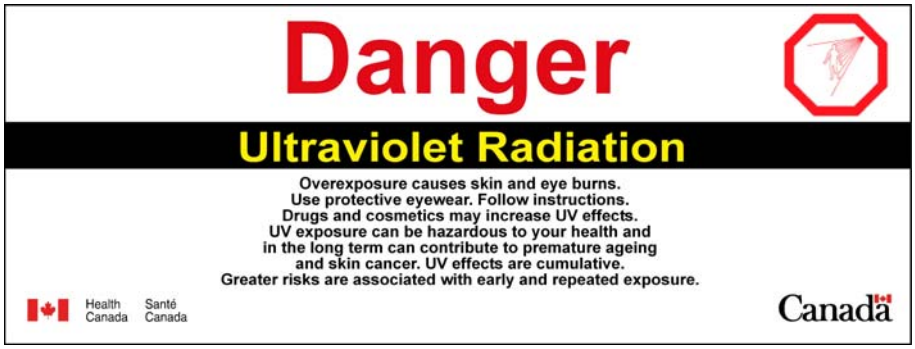
(i) 75 mm high and 200 mm wide, in the case of tanning equipment used for full- or half-body exposure, and

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

(*e*) conform to the following diagrams:

Figure 1

Figure 2



6. (1) Subject to subsection (2), all advertising material in relation to tanning equipment must include, in a clearly legible manner, the signal word "Danger", the primary hazard statements "Ultraviolet Radiation / Rayonnements ultraviolets" and the messages set out in subparagraphs 5(*b*)(iii) and (*c*)(iii).

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

(*a*) if it is only in French, the signal word "Danger", the primary hazard statement "Rayonnements ultraviolets" and the message set out in subparagraph 5(*b*)(iii); and

(*b*) if it is only in English, the signal word "Danger", the primary hazard statement "Ultraviolet Radiation" and the message set out in subparagraph 5(*c*)(iii).

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*).

Appendix F

Federal Provincial Territorial Radiation Protection Committee (FPTRPC)* Position Statement on Ultraviolet Radiation

1. There is ample scientific evidence demonstrating that excessive exposure to ultraviolet radiation (UVR) in sunlight and from artificial sources causes acute and chronic adverse health effects. The main organs affected by UVR are the skin and the eyes. There is increasing evidence indicating that UVR also acts as a systemic immuno-suppressor.

2. Exposure to solar and artificial ultraviolet radiation is widely recognized as an important, and preventable, cause of skin cancer. There is significant scientific evidence indicating that long-term exposure to UVR also plays a role in the development of some types of cataract and other eye and skin conditions.

3. The main source of ultraviolet radiation in the environment is the sun. Outdoor workers and people spending leisure time in the sun may be overexposed to UVR, particularly during spring and summer. Artificial sources of UVR can be found in the work and recreation environments. Welding arcs, special-purpose lamps, and other sources can expose workers to high levels of UVR. Tanning equipment accounts for significant additional UVR exposure of users.

4. The UVR dose to the population can be significantly decreased by applying simple strategies and control measures to reduce sun exposure. The FPTRPC recommends that protective measures against excessive exposure to solar and artificial ultraviolet radiation, such as those contained its overview document, be implemented by health, education, labour, and recreation authorities in all provinces and territories and adopted by the general public.

5. The FPTRPC recommends that particular attention be given to the reduction of UVR exposure among the following groups:
    - **Children**. As much as 60 % of the lifetime UVR exposure takes place before the age of 18 years.
    - **Sensitive people**. People with lightly pigmented skin, hair and eyes are at higher risk of developing skin cancer.
    - **Outdoor workers**. Outdoor UVR dose exceeds exposure guidelines, especially during spring and summer.

6. The FPTRPC recommends that tanning and the use of tanning equipment, particularly by minors, be discouraged. The FPTRPC further recommends that provincial and territorial authorities evaluate the need for operator-based regulation of tanning salons.

* The **Federal Provincial Territorial Radiation Protection Committee** comprises a forum of delegates from each of the following government organizations: Canadian Nuclear Safety Commission, Department of National Defense; Health Canada, Radiation Protection Bureau; and Provincial and Territorial Radiation Protection Programs. It was established to support Federal, Provincial and Territorial government radiation protection agencies with their respective mandates in Canada. The mission of the committee is to advance the development and harmonization of practices and standards for radiation protection within Federal, Provincial and Territorial jurisdictions.

TANNING OPERATOR - KNOWLEDGE QUESTIONNAIRE

The owner or manager of the facility should ensure that each operator completes the following questionnaire to evaluate his or her knowledge about UV radiation. (Please photocopy as needed)

It is recommended that the owner or manager retain copies of the completed questionnaire in their appropriate employee training file. It is also recommended that operators **not** be permitted to work with clients until they can answer **all** of the questions in the questionnaire correctly.

Operator's name: _____ Date completed: _____

1. Name the three wavelength regions that ultraviolet radiation may be divided into.

2. Which of these three wavelength regions of ultraviolet radiation is now most prevalent in commercial tanning equipment emissions?

3. Briefly, what is the skin's reaction that causes erythema?

4. List one painful eye injury resulting from ultraviolet radiation exposure.

5. Of UVA and UVB, which penetrates most deeply into the layers of the skin?

6. Of UVA and UVB, which is responsible for long term or long lasting tans?

7. What is the correct medical term for skin reddening or sunburn?

8. List two common categories of drugs or medications which may increase sensitivity to ultraviolet exposure.

9. The sun produces about 2.5 mW/cm^2 of UVA in summer around noon. How much UVA does a typical tanning bed produce?

10. What precautions should be taken by an employee when performing maintenance on any of the tanning equipment (e.g., changing UV bulbs, cleaning equipment, etc.)?

True or False

11. Most conventional commercial tanning devices emit some UVB radiation.

    True False

12. The risk of developing skin cancer will increase as total ultraviolet exposure is increased.

    True False

13. Cataracts can be a long term chronic effect of ultraviolet radiation exposure of the eyes.

True False

14. After using a commercial tanning facility, if a customer complains of red irritated and watering eyes, or an itching skin rash causing discomfort, the customer should be told that the cause might be related to ultraviolet exposure.

True False

15. The customer doesn't have to wear protective eye-wear while using a tanning device at a commercial tanning facility if he or she does not want to.

True False

16. A fair-skinned person with red or blond hair and freckles should be allowed to use a tanning unit for as long as a dark haired, dark skinned, brown eyed individual.

True False

17. Ultraviolet radiation is responsible for premature skin aging effects such as wrinkling and skin hardening.

True False

18. UVA radiation exposure causes the skin to produce more melanin-producing cells, thus creating a longer lasting tan.

True False

19. It is the customer's responsibility to ask the owner or operator for instructions on the proper use of tanning equipment.

True False

Results: Correct Answers _____ **Incorrect Answers** _____

Comments: _____

_____

Owner's or manager's signature _____ Date _____

TANNING OPERATOR KNOWLEDGE - ANSWER KEY

CORE QUESTIONS

1. **UVA, UVB and UVC** are the three ultraviolet radiation wavelength regions.

2. **UVA and UVB**: Commercial tanning equipment all emit primarily UVA radiation, with either a small amount of UVB or else UVA with a considerable amount of UVB.

3. **Erythema** is the medical term for inflammatory redness of the skin. It can be produced by exposure to UV Radiation. When this happens, Erythema is commonly called "sunburn".

4. **Photokeratitis** or **photoconjunctivitis** (also known as welder's flash or snow blindness) are two painful eye injuries that can result from exposure to UV radiation.

5. **UVA** is the wavelength which penetrates most deeply into the skin

6. **UVB** causes long lasting tans by increasing the production of the melanin pigment in the skin.

7. **Erythema** occurs when the small blood vessels in the skin dilate and increase the flow of blood to the skin's surface.

8. **Antibiotics, antihistamines, oral contraceptives and tranquilizers** are some of the common classes of drugs which can increase the skin's sensitivity to UV radiation. (See Appendix B for full list).

9. Tanning beds typically produce between **7 to 20 mW/cm^2 of UVA**, which is as much as three to eight times the UVA the sun produces at noon in the summer.

10. When maintenance is being performed on the tanning equipment, the employee should either turn off all the tanning bulbs while working on or around the equipment, or else wear protective eyewear and clothing to minimize their exposure and protect against potential damage to their eyes and skin

True or False Questions

11. **True**
    All tanning lamps emit some UVB radiation, the form of ultraviolet radiation with the greatest capability of causing sunburns. All operators **must** be aware of the maximum exposure times for their clients, depending on their skin type and the intensity of the lamps used in their tanning equipment.

12. **True**
    The risk of developing skin cancer increases as total exposure to ultraviolet rays increases.

13. **True**
    Ultraviolet radiation exposure to the eyes can cause cataracts, photokeratitis and other painful eye injuries.

14. **True**
    Operators should tell customers that exposure to ultraviolet radiation at a tanning salon can cause watering eyes, an itching skin rash or sunburn.

15. **False**
    All customers **must** wear protective eye-wear while using tanning equipment.

16. **False**
    Fair-skinned people with red or blond hair and freckles should not use a tanning device for as long as people with dark hair, dark skin and brown eyes. Fair-skinned people are most at risk of burning and skin cancer. Children, the elderly and those who always burn or don't tan well should not use tanning units at all.

17. **True**
    Ultraviolet radiation causes premature skin aging effects such as wrinkling and hardening.

18. **False**
    Although UVA radiation penetrates more deeply into the skin, it is mainly the UVB exposure that causes the skin to produce more melanin, muting a long lasting tan. UVB radiation is 1,000 times more likely to cause sunburn than the same intensity of UVA radiation.

19. **False**
    Operators must provide customers with clear instructions on how to use tanning equipment, including maximum exposure times (based on their skin type) and the need to wear protective eye wear while tanning.