

Artificial UV radiation

The following information is an excerpt from Reducing the incidence of skin cancer in Nova Scotia – Protecting youth from exposure to artificial ultraviolet radiation report dated October 2005 by the Sun Safe Nova Scotia coalition.

Indoor tanning

Exposure to artificial UV radiation for cosmetic purposes is the consumer's choice. Indoor artificial tanning is offered as a cosmetic service in the form of tanning beds and tanning booths. Commercial tanning equipment can be found at various outlets including beauty parlors, hair salons, fitness centers, health spas or at exclusive artificial tanning locations. In Nova Scotia, any business regardless of its primary function, is eligible to purchase tanning equipment and to offer artificial tanning to their patrons (e.g. video rental outlet, fitness centre, etc).

Some owners and operators require the provision of information about skin type, burning tendencies and medications for membership or user privileges of the tanning equipment. Use of a tanning bed, referred to as a "tanning session", may last up to 25 minutes at a frequency decided upon by the consumer. Some locations do not permit more than two tanning sessions per 24-hour period.

Artificial tanning beds emit both UVA and UVB radiation at relatively controlled rates when purchased new. Most artificial tanning equipment emits UVA to UVB in roughly a 9:1 ratio. Both UVA and UVB exposure with or without subsequent burns cause cell damage and an increased risk of skin cancer development.

Alternatives to indoor tanning using artificial UV exposure include outdoor tanning, make up and self tanning lotions, as well as the newest item, the "spray tan," which involves exposure to aerosol skin-darkening particles for approximately 60

seconds. A “spray tan” is expected to last about seven days. The effects of “spray tans” remain to be studied.

Artificial UV radiation – Skin cancer and other health concerns

The most significant risk factor for developing skin cancer is exposure to UV radiation. For both basal cell carcinoma and melanoma, intermittent intense exposures seem to carry higher risk than do lower level, or chronic exposures. Alternatively, the risk for squamous cell carcinoma is strongly associated with chronic UV exposure. The damaging effects of both artificial and natural UV radiation accumulate with each and every exposure. The type of skin and number of burns as well as previous skin cancers all increase the risk of further skin cancer development. There have been many prospective and retrospective case studies indicating an association between artificial tanning bed use and the development of skin cancers. In March 2005, Gallagher et al published their findings of a scientific review of ten studies comparing cases of melanoma with a patient history of ‘ever’ or ‘never’ using a tanning bed.^[7] For those who used a tanning bed, they were at an increased level of risk of developing a melanoma.^[7] Those who received their first artificial tanning bed exposure as a young adult or had the longest duration of exposure to artificial UV radiation had a significantly elevated risk compared to the other groups.^[7] Similar to tobacco use, the carcinogenic effects of artificial tanning bed use are expected to affect a certain group of the population and to present later in life. However, with the recent increase of skin cancer in young adults the effects of UV radiation may be more immediate than initially thought. We now have evidence that preventing exposure to artificial radiation can reduce this risk and protect the health of Nova Scotia’s youth.

In addition to the carcinogenic effects of exposure to artificial UV radiation, tanning bed use can also cause other health and dermatological problems. People who tan put themselves at an increased risk of UV-radiation skin burns, burns to the cornea of the eye along with other eye damage. In addition, certain individuals such as patients with photosensitivity conditions like lupus are at an increased risk of life-threatening reactions.^[3, 5] Such reactions are usually the result of medications that cause extreme light-sensitivity. Other skin problems including infections and structural damage such as premature aging and wrinkles are the result of tanning bed use. Yet, despite this evidence, artificial tanning has been promoted as a healthful way to achieve a protective tan.^[5]

Artificial UV radiation – Adolescent behaviour

It is clear that a tanned appearance has become a symbol for healthy skin and attractiveness. Studies show a significant interest and preference for tanned skin, especially in the female, young, and single populations.^[1, 8-11] To date there has been only one reported study examining the tanning behaviour of Canadian youth. In 1998, Lovato et al conducted a national survey on sun exposure and protective behaviours for different age-groups.^[12] Of the 4023 successful surveys, 574 were completed by youth ages 15 – 24.^[12] It is not known how many surveys were completed in Nova Scotia. Results of this study indicated that the majority of youth were exposed to sun on a daily basis, experienced at least one sunburn per year and did not protect themselves from the sun consistently.^[12] A suntan was actively sought by 44 per cent of all youth during the study period, either from the sun or by using artificial methods.^[12] Tanning beds were the most common method of artificial tanning (82 per cent).^[12] Although this study does not specifically represent the adolescent population, nor define artificial tanning by specific

age, there is evidence in other studies that 10 per cent of US and Swedish adolescents ages 12-18 have used artificial tanning equipment at least once.^[1, 10] In each study, females were far more likely to report tanning bed use than males.^[1, 10, 12, 13] The use of such facilities also increased with age.^[1, 10, 13] Adolescents with the best tan response were more likely to use tanning beds, but use among those with the more sensitive skin type was also recorded.^[13]

Appearance-related motives have been identified as strong psychological indicators of intentional sun exposure among adolescents.^[10, 13] Surveyed adolescents used tanning beds to develop a base tan, to improve attractiveness and because it was common among their peers.^[10, 13] Many of these reasons were identified in all age groups indicating that these preferences and behaviours are established at an early age.^[10] Reasons for not using artificial tanning equipment included: “tanning salons are dangerous for the skin,” “preference for solar exposure,” “no desire to tan,” and “too expensive.”^[9] Yet, despite this understanding by some, there is still a high number of adolescents who tan using artificial tanning equipment. In the United States tanning bed use increased from 7 per cent among 14-year old girls to 16 per cent by age 15 and more than doubled again by age 17 to 35 per cent.^[1] Since youth is an especially critical period during which UV irradiation increases skin cancer risk, altering the tanning behaviour of minors is an important goal in disease prevention.^[3]

Artificial UV radiation – Industry growth

In the United States the commercial indoor tanning business has become one of the fastest growing industries with over 30,000 facilities providing artificial tanning

services.^[6, 14] Between 1986 and 1996 there was a three-fold increase in the percentage of US tanners who used tanning beds.^[6]

In 2003 the North American tanning industry served an estimated 28 million persons, including 2.3 million teenagers, generating a revenue of nearly \$5 billion US.^{[3,}

^{14]} In July 2005 the authors investigated the tanning salon industry in Nova Scotia. Using databases onsite at the Nova Scotia Business Service Centre, we reviewed the section titled Tanning Salons in the *Atlantic Provinces Business-to-Business Sales and Marketing Directory from 1991 to 2005*. In 1991 there were 27 registered tanning salons in Nova Scotia; increasing to 157 in 2005 (Figure 1). This is nearly a six-fold increase in the number of salons in 14 years. Analyzing the data from each year identified a 12 per cent annual increase in the number of salons. Currently, Nova Scotia ranks fifth in all provinces and territories in the number of salons per province (Figure 2).

Figure 1

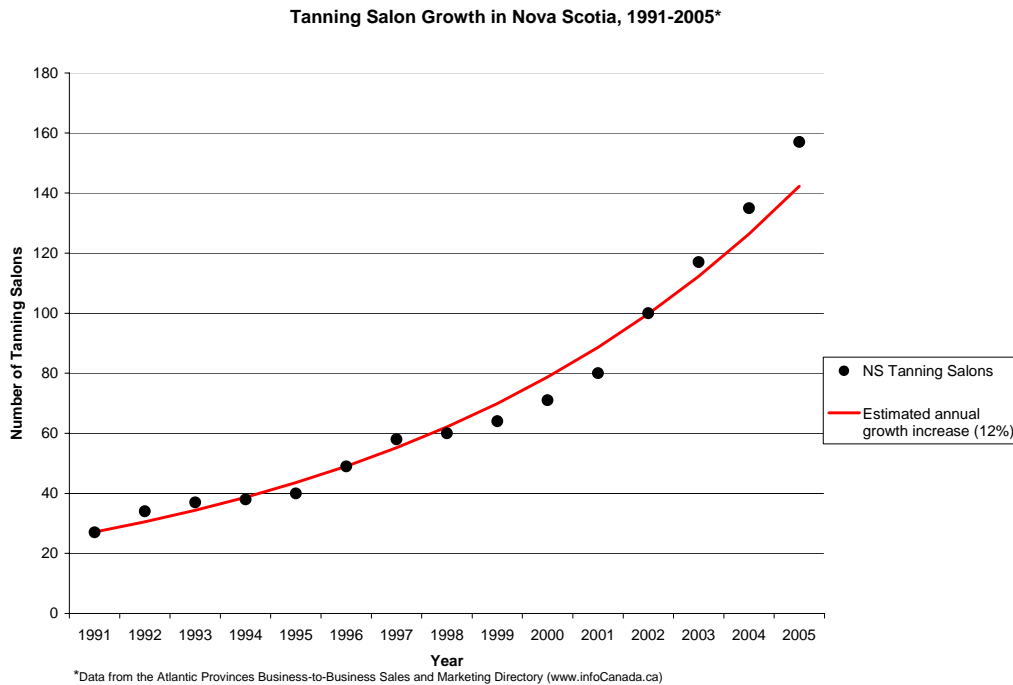
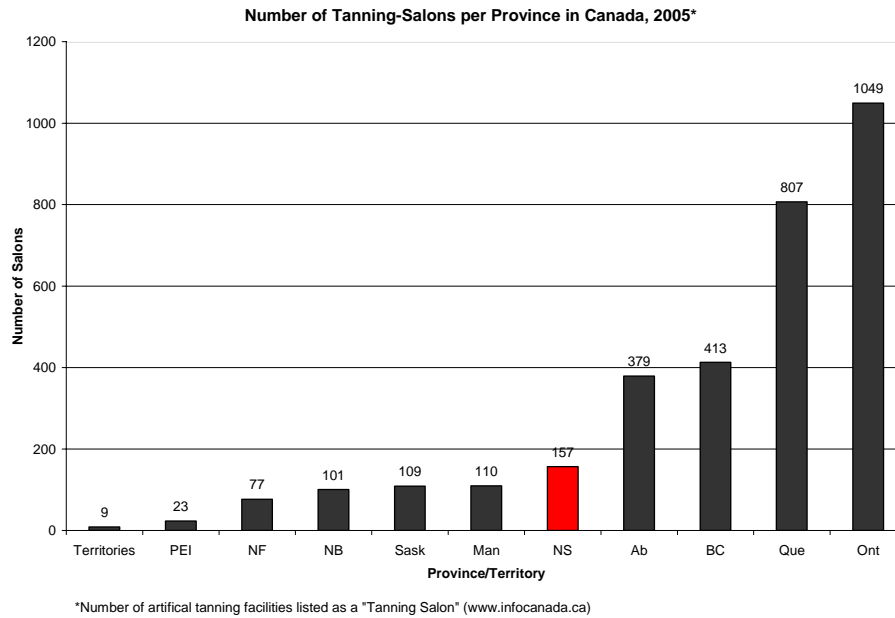


Figure 2



Artificial UV radiation – The industry in Nova Scotia

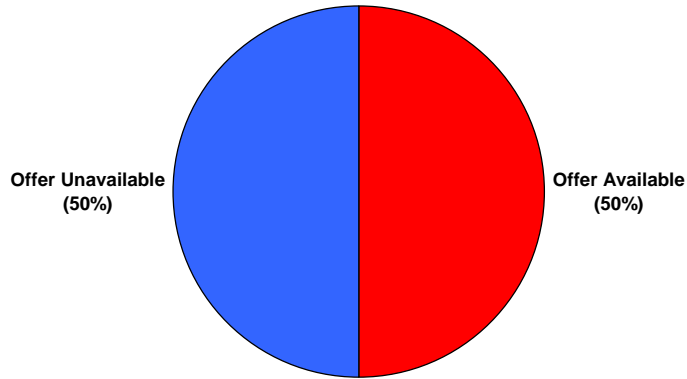
In order to identify the similarities and differences of professional practice within the HRM tanning industry, the authors contacted all 56 tanning salons registered in the HRM directory. Standard questions were asked to each company representative and all information was recorded. Highlights from this survey include:

- Number of tanning beds per facility ranged from 1 to 13. The average number of beds was 5.4.
- Business hours available for tanning ranged from 43/week to 94/week. The average was 68.4 hours/week.
- The price for 1 tanning session ranged from \$3.95 to \$8.00 before taxes. Only three companies offered a tanning session for under \$5. There were many promotional packages available at most tanning salons.

- Unlimited tanning was offered at 50 per cent of the tanning salons, ranging from \$40-\$80 per month (Figure 3).
- Businesses that did not offer unlimited tanning packages stated that such packages were: “Not healthy,” “Not endorsed by their insurance company,” and “Not feasible for the consumer.”
- Protective eye goggles were supplied free of charge at 70 per cent of the companies. All other companies sold goggles. Those who did not supply free goggles had the following reasons: “Not sanitary,” “Not recommended by Health Canada,” and “Too many were getting stolen.”
- The majority of salons recommended tanning every second day (38 per cent). 17 per cent stated that it was not permitted to tan more than twice within 24 hours. Some salons stated that schedules depended upon one’s skin type (Figure 4). For those who offer unlimited tanning, tanning every day was common.
- The majority of salons (58 per cent) stated that individuals under 18 would need a parent’s signature/permission in order to tan. 31 per cent stated that anyone under the age of 16 would need consent. Any age (presuming no less than 14) was fine for 13 per cent of the companies (Figure 5).

Figure 3

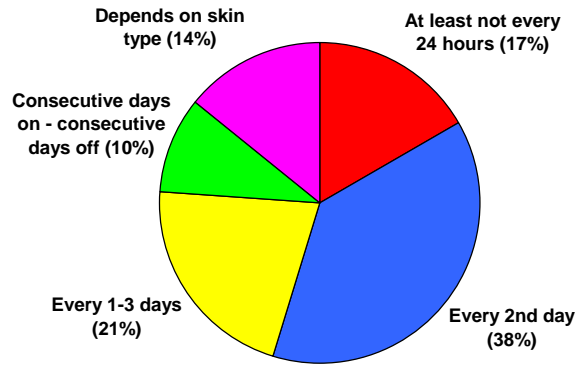
Survey* Question #1: Do you currently offer unlimited tanning packages to your patrons?



*Survey conducted on all artificial tanning facilities listed as a Tanning Salon in the HRM Telephone Directory in July of 2005

Figure 4

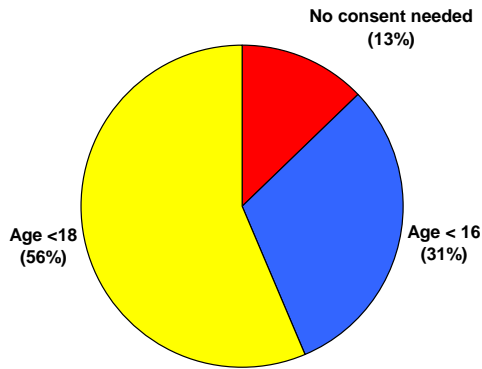
Survey* Question #2: What do you recommend as a maximum artificial tanning schedule?



*Survey conducted on all artificial tanning facilities listed as a Tanning Salon in the HRM Telephone Directory in July of 2005

Figure 5

Survey* Question #3: At which age does a patron need parental consent?



*Survey conducted on all artificial tanning facilities listed as a Tanning Salon in the HRM Telephone Directory in July of 2005

Results from this survey establish the inconsistencies within the artificial tanning industry in the HRM. Strikingly, some businesses recognize that certain practices such as unlimited tanning and offering tanning to those under the age of 18 are not acceptable. Despite not soliciting the operators' knowledge of the guidelines and regulations (*RED Act*), it can be concluded that the *RED Act*, in particular, is not being followed. In February 2005 Health Canada made amendments to the *RED Act*. These included signage, specific exposure times per session as well as per year. Session-exposure time should be controlled by the tanning bed manufacturers; however, the total amount of annual exposure can only be followed by the operator or consumer. The *RED Act* states that a tanning bed must not be able to emit more than 625 J/m^2 per tanning session and that no one should receive artificial UV radiation in excess of 15kJ/m^2 per year.^[15] At these maximums an individual should be

exposed to no more than 24 tans of maximum exposure per year. Tanning salon patrons who tan daily, tan up to ten-times the stated amount.

The discrepancies among the tanning service providers in the HRM are the result of lack of education and regulation in this industry. As a result, health-conscientious companies are forced to compete with places that abuse these service privileges. Other studies have also reported variation in services, noting that in one community, 75 per cent of tanning salons promoted unlimited tanning.^[11] Other professional inconsistencies within the tanning salon service include the enormous variability in tanning bed UV output as well as the variability in training among tanning salon operators.^[11]

Artificial UV radiation – Current regulations

To date, tanning operations are poorly regulated and existing regulations and recommendations are frequently ignored.^[6] For example, state inspections of North Carolina tanning facilities discovered that the Food and Drug Administration-recommended exposure schedule was not being followed with 95 per cent of patrons exceeding the times recommended.^[23] Poor compliance to such regulations and guidelines is predicted throughout North America. In Canada there are two documents, *Guidelines for Tanning Salon Owners, Operators and Users* and the *Radiations Emissions Device (RED) Act* that attempt to govern the industry. The former is an annual guide established by the federal Ministry of Health to provide information and suggest direction for operation.^[2] It is not known how many tanning salons are

aware of and knowledgeable about these guidelines. The *RED Act* controls the manufacturing and importing of tanning equipment.^[4] Companies are required to follow these regulations before selling equipment to Canadian retailers. Inspectors from the Consumer and Clinical Radiation Protection Bureau (CCRPB) are responsible for enforcing the *RED Act* and are in direct contact with manufacturers and importers. Should an incident occur in the retail setting, field inspections by this department may occur and the local health department should be contacted by the operator. The *RED Act* also suggests maximum doses of artificial UV radiation per tanning session and per year. Although tanning-equipment is limited to the amount of time per session, there is no control of how much exposure an individual gathers per year. The onus to comply with the *RED Act* lies with the manufacturer and not with the retailer. A significant limitation of the *RED Act* is that it is not retroactive and applies only to artificial tanning equipment manufactured or sold after the amendments were implemented in February 2005.

References

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