

# Researchers study how patterns, timing of sunlight exposure contribute to skin cancers

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(Medical Xpress)—Researchers at Moffitt Cancer Center, the University of South Florida and the International Agency for Research on Cancer in France have studied the patterns and timing of sunlight exposure and how each is related to two nonmelanoma skin cancers – basal cell carcinoma and squamous cell carcinoma.

This study, published in the open-access journal [BioMed Central](#), is the first case-control study to simultaneously evaluate identical patterns and timing of [sunlight exposure](#) as they are related to basal cell and squamous cell carcinomas in the same U.S. population with high annual ultraviolet radiation exposure. Patterns of sunlight exposure are continuous or intermittent, and timing refers to exposure during childhood, adulthood or both. It included 703 Florida residents - 218 with [basal cell carcinoma](#), 169 with squamous cell carcinoma and 316 without skin cancer. The research goal was to identify potential differences or similarities in sunlight exposure responses for basal cell and squamous cell carcinomas.

"There are more than a million new cases of basal cell and squamous cell carcinomas diagnosed in the United States each year," said senior study author Dana E. Rollison, Ph.D., associate member of the Cancer Epidemiology Program, and vice president and chief health information officer at Moffitt. "While mortality associated with [nonmelanoma skin cancers](#), such as basal cell and squamous cell carcinomas, is low, patients may experience substantial morbidity and treatment costs are high."

It is estimated that 25 percent of lifetime sunlight exposure occurs before age 18. Youth is a time of greater toxic sunlight exposure and also a time when the chances of receiving blistering sunburns are higher.

"Blistering sunburn is believed to result from high doses of [intense ultraviolet radiation](#) exposure in short increments of time and is considered to be a measure of intermittent exposure," said study co-author Michelle Iannacone, Marie Curie [postdoctoral fellow](#) at the International Agency for Research on Cancer.

The researchers surveyed those with basal cell and squamous cell carcinomas, as well as those with no history of skin cancer, to determine the effects of intermittent versus continuous sunlight exposure, as well as the timing of the exposure and age. They noted that although the relationship between both cancers and sunlight exposure is complex, researchers began to identify cumulative outdoor sunlight exposure as a risk factor for nonmelanoma skin cancer beginning in the 1950s.

Being exposed to ultraviolet radiation intermittently, perhaps while on summer vacation in high ultraviolet radiation regions, and continuous exposure through working at a job outside in the sunlight were patterns the researchers wanted to identify and correlate to basal cell and squamous cell carcinomas.

Study subjects were surveyed on their recollections of their history of sun exposure.

Survey results reveal that a history of blistering sunburn was associated with both basal cell and squamous cell carcinomas. Having a job in the sunlight was also associated with basal cell and squamous cell carcinomas. Measures of younger age at sunlight exposure "tended to be associated with squamous cell carcinoma, but not basal cell carcinoma, risk," researchers concluded.

"Sunlight exposure, regardless of the exposure pattern, is associated with both basal cell and

squamous [cell carcinomas](#)," Iannacone said.

"Understanding how sunlight exposure response may differ by nonmelanoma skin cancer type is important for educating the public on safe sunlight behaviors. Applying sunscreen while on vacation may decrease basal cell carcinoma risk with intermittent sunlight exposure, but may not impact the risk of [squamous cell carcinoma](#), which may be more strongly related to continuous sunlight exposure."

Provided by H. Lee Moffitt Cancer Center & Research Institute

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