

# Diary Reveals Sun Protective Practices

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A diary that provides a daily record of sun protection behavior is a promising new approach to skin cancer prevention. It can motivate people to become aware of how they are increasing their risk of skin cancer and reinforce the importance of following sun protective practices.

Daily records of sun exposure and protection are also a potentially valuable tool for evaluating the impact of skin cancer prevention programs.

There is precedent for this approach from other health behavior research. Food diaries, or dietary records, are often used in nutrition research to obtain an accurate assessment of the types and amounts of foods consumed.<sup>1-3</sup>

## Need for a Change

The goal of the pilot study we initiated at the Cancer Research Center of Hawaii was a reduction in the number of nonmelanoma skin cancers—basal cell and squamous cell carcinomas. These are the most common malignancies occurring in the United States, accounting for slightly more than one-third of all cancers. The number of new cases a year has been estimated at 900,000 - 1.2 million new cases.<sup>4</sup>

About 90 percent of all skin cancers diagnosed each year could be prevented if people protected themselves from the sun's rays.<sup>5</sup> The use of sunscreen, protective clothing, and avoidance of sun exposure at peak hours are important habits to develop.

## Aims of Pilot Program

The aims for our pilot program were to examine the feasibility of using sun exposure diaries; to pre-test a prototype diary, and to establish how many days the

diary should include. Because a questionnaire might be an alternative to a diary, our study began by comparing the results of a sun habits questionnaire and a one-week sun protection diary.

In this phase of the study, we also sought to determine whether a sun exposure diary, used alone, would alter the habits of the people who completed it.

## Study Participants

Subjects were recruited from the general public by word-of-mouth and from dermatology patients who had been seen for precancerous skin conditions or nonmelanomas. Twenty-three of them began the study and twenty completed it.

The female: male ratio was 60:40, and the average age was 45 years (range 26 to 74). Sixty percent were of Caucasian ethnicity, and the other 40 percent were Asian or Pacific Islanders. The educational level was high, with 50 percent having at least a college degree. They had lived in Hawaii an average of 22.6 years. Forty percent had visited a dermatologist within six months, and 60 percent had visited a dermatologist within the preceding two years.

SAMPLE COMPLETED DIARY PAGE												
Day: Saturday Sunday (Please circle one)		Weather			Date: June 29, 1995		Today's UV Index: II					
	Write in the box what you were doing most of during this one hour period.	Weather			Were you wearing sun-screen?		Were you wearing a hat?		Were you in the shade?		Were you covered up?	
		Mostly Sunny	Partly Cloudy	Very Cloudy	Yes	No	Yes	No	Yes	No	Yes	No
	Main OUTDOOR activities											
7 am												
8 am	Walk in park	✓			✓		✓			✓	✓	
9 am	Same	✓			✓		✓			✓	✓	
10 am												
11 am	Played Tennis	✓			✓		✓			✓	✓	
Noon	Lunch on lanai				✓			✓			✓	
1 pm								✓				
2 pm	Driving car	✓			✓			✓			✓	
3 pm	Errands	✓			✓			✓		✓	✓	
4 pm	Driving car		✓		✓			✓		✓	✓	
5 pm	Swimming at beach		✓		✓			✓		✓		✓
6 pm												
7 pm												

## Questionnaire Plus Diary

Each participant received a mailed packet including a cover letter, questionnaire, and a sun exposure diary. Participants were also telephoned after receiving the packet to review study procedures.

Educational information was not given to the study subjects at this time, as we were not attempting to

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influence their sun protection practices. They were asked to fill out and return the questionnaire, and then complete the sun exposure diary for the next seven days.

The questionnaire included a list of questions about background, characteristics, skin cancer-related beliefs and knowledge, sun exposure habits, and sun protection practices. Questions were based on those developed for previous research studies on skin cancer prevention.<sup>6,7</sup> Expert review of the questions was conducted by dermatologists and cancer control researchers.

**Sun Exposure on Weekends/Weekdays.** Based on sun exposure diary results, we found that weekend days (Saturday and Sunday) accounted for the great majority of time spent outdoors (42.4% of total), time spent in the sun (45.1%), sunscreen use (41.6%), and other sun protection practices.

Adding two weekdays raised the percentages for these behaviors to approximately 65%. Each of the remaining three weekdays accounted for about 11% of total exposure or protection. Therefore, it was determined that a four-day diary that included two weekdays and both weekend days is adequate to assess sun exposure and protection habits throughout the week. Longer periods of time prove fatiguing and burdensome to respondents.<sup>2,3</sup>

### Questionnaire Vs Diary

We compared questionnaire and diary reports of average sun exposure for weekdays and weekends during the peak sun hours of 10 a.m. to 3 p.m. Diary responses indicated a weekday average of 1.22 hours in the sun and a weekend daily average of 2.02 hours.

In responses to the questionnaires, subjects gave an average of 1.80 hours (summer) and 1.84 hours (winter) weekday

sun exposure, and 2.78 hours (summer) and 2.48 hours (winter) weekend day exposure. The difference can be attributed to the fact that the questionnaire asked respondents to estimate their usual exposure over time, while the diary reported the actual exposure. Though the questionnaires appear to slightly overestimate sun exposure, they are within a reasonable range of the diary responses.

Our subjects were working persons whose major sun exposure occurred during recreation and transport. Obviously, the length of time spent in the sun is greater for tourists and for those with outdoor occupations.

Questionnaire and diary responses are summarized in the Table, which lists sun protection habits. Subjects were asked to give their questionnaire responses in terms of frequency (rarely or never/sometimes/usually/always), and diary responses were converted to proportions based on the amount of time spent outdoors in the sun. Survey and questionnaire results were significantly correlated for use of sunscreen and covering up with protective clothing, but not for seeking shade when outdoors.

Sun Protection Habits		
	Questionnaire	Diary Responses
Use of sunscreen when outdoors	Rarely/never: 15%	29.5% of time (average)
	Sometimes: 20%	
	Usually: 40%	
	Always: 25%	
Covering up (with a shirt)	Rarely/never: 60%	13.0% of time (average)
	Sometimes: 25%	
	Usually: 15%	
	Always: 0%	
Staying in the shade outdoors	Rarely/never: 10%	31.2% of time (average)
	Sometimes: 40%	
	Usually: 40%	
	Always: 10%	

The sun exposure diary was in booklet form, with each page representing one day of the week. (See reproduction of sample page.) Beside each daylight hour, space was allotted for descriptions of sun exposure, intensity of the sun, main activities, and sun-protection habits, i.e., using sunscreen, wearing a hat, staying in the shade, covering up. At the end of the diary, subjects responded to questions about their use of the diary, and opinion of it.

Each participant who completed the study received a small thank-you gift of a sun protection kit with informational materials, samples of sunscreen, and a wide-brimmed hat.

### Study Results

Data analysis included calculating descriptive statistics for both questionnaire (survey) and diary responses. Indexes of sun protection practices were derived from the diary data, based on answers to questions about avoiding the sun at peak hours, covering up, and using sunscreen. We also determined whether answers given in the questionnaire differed from the reports written in the diary.

We concluded that self-monitoring can provide a more precise measurement of individuals' actions than responses to questionnaires about "typical habits."

### Opinions on Record-Keeping

Subjects were asked when they completed the diary, how they felt about it, and whether it affected their sun habits. Forty percent reported filling in the diary on an hourly basis throughout the day; another 40 percent completed it at the end of the day, and 20 percent used some combination of these times.

Opinions about the diary were generally favorable, with 70 percent saying it was easy to understand and use. Only 5 percent answered that it was confusing, and 10 percent reported that it was too much effort. Another 5 percent said it was interesting.

### Results of Self-Monitoring

Thirty-five percent of respondents felt the diary gave them a better understanding of their habits. However, the proportion of those who actually altered behavior patterns was considerably smaller:

Alterations in their sun exposure and/or protection habits as a result of using the diary were reported by 20 percent of subjects. The changes included being more careful to avoid the sun during its peak hours, to seek shade and wear sun-protective clothing, including a wide-brimmed hat and sunglasses, and to regularly apply sunscreen with a Sun Protection Factor (SPF) of 15 or greater.

### The Next Step

The reactions to the sun exposure diary were generally favorable. However, the fact that only one-fifth of respondents actually made behavioral changes points to the need for additional intervention strategies.

A second phase of the pilot study will include specific guidance to encourage individuals to make use of the diary to increase their awareness and keep track of their efforts to reduce sun exposure and follow sun

protection practices. Data from this study will not only examine knowledge and attitudes as related to behavior, but will also explore differences in high-risk versus average-risk individuals.

Subsequent phases of the pilot study will utilize a new four-day diary, including the two weekend days, and will test the use of self-monitoring and feedback interventions to improve sun protection habits. A questionnaire will also be used.

This pilot study was limited by its small, select sample, and by being conducted in Hawaii with its tropical location and year-round sunshine. Further research in other regions is needed to develop valid, reliable, and feasible measures of sun exposure and sun protection practices, and to test innovative skin cancer prevention strategies.

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*To obtain a single complimentary copy of the diary booklet, write to Karen Glanz, Ph.D., M.P.H., Prevention and Control Program, Cancer Research Center of Hawaii, University of Hawaii, 1236 Lauhala Street, Honolulu, HI 96813.*

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