

## Do Athletes Practicing Outdoors Know and Care Enough About the Importance of Photoprotection?

Athletes practicing and competing outdoors are exposed to considerable UV radiation and at an increased risk for the development of UV-related skin conditions, including skin cancer.

Risk factors for skin cancer include genetics, immune status, and particularly UV radiation. Independent factors, such as phototype, family or personal history of melanoma, number of nevi, atypical nevi and solar lentigines, as well as sunburn history are also important risk indicators for skin cancer, especially melanoma (1-3). Additionally, exercise-induced immunosuppression may contribute to the development of skin cancers (4).

To the best of our knowledge, only one article has been previously published analyzing the effects of UV exposure in triathlon athletes (5).

Our aim was to analyze sun protection habits of athletes competing in the Croatian Olympic and Super Sprint triathlon and screen them for skin cancer and other skin lesions.

Participants completed a questionnaire consisting of questions regarding personal and family history, phenotypic characteristics, training habits, and sunlight-related risk factors. Additionally, a total body skin examination was performed by a board-certified dermatologist. Skin type, number of melanocytic nevi, presence of atypical nevi, solar lentigines, as well as suspicious lesions were recorded (Figure 1).

The study population consisted of 95 participants, 65 (68%) men and 30 (32%) women. Approximately 30% of participants spent 4 to 6 hours per week outdoors, while 21% spent more than 10 hours outdoors per week. Regarding sun protection habits, more than 90% of participants stated it was important to use sunscreen, however, almost 50% rarely used sunscreen while training, 27% frequently used sunscreen, while only 3% always used sunscreen. A staggering 20% of participants never used sunscreen. Unsurprisingly, almost a third of the athletes (26%) reported previously having severe sunburns with blisters.

This questionnaire is anonymous and serves for the purpose of early detection and analysis of the occurrence of malignant lesions on the skin that may be caused by exposure to UV rays, in individuals practicing triathlons.

SEX:	AGE:	PLACE OF RESIDENCE:
Eye color: 1. blue 2. green 3. brown 4. black	Hair color: 1. red 2. blonde 3. brown 4. black	
1. Training practice: A. professionally B. recreational	2. Training practice: A. <1 year B. 1-5 years C. 5-10 years D. >10 years	8. If YES, what: A. cap (baseball cap) B. hat C. sunglasses D. Clothing with UV protection
3. Amount of time I spend training outdoors (on average): A. up to 4h/week B. 4-8h/week C. 8-10h/week D. >10h/week	4. While training outdoors I use sunscreen (creams, etc.): A. always B. often C. rarely D. never	9. When training outdoors on a sunny day, I usually wear: A. long sleeve T-shirt B. long pants C. short sleeve T-shirt D. sleeveless shirt E. short pants
5. When using sunscreen, I apply: A. water resistant sunscreen B. non-water resistant sunscreen C. combination	6. When applying sunscreen, I apply a sunscreen with a sun protection factor (SPF) of: A. SPF <10 B. SPF 15-25 C. SPF 25-50 D. SPF 50+	10. Do you consider it important to apply UV protection agents while training? YES / NO
7. Use of other UV protection agents: YES / NO		11. Has anyone in your family been diagnosed with melanoma? YES / NO
		12. Has anyone in your family had any other type of skin tumor? YES / NO
		13. Have you been previously diagnosed with melanoma? YES / NO
		14. Have you been previously diagnosed with any other type of skin tumor? YES / NO
		15. Have you ever suffered from severe blistering sunburns? YES / NO
		16. Do you consider these skin cancer screenings useful? YES / NO
		16. Have you ever had a skin examination? YES / NO

### FILLED OUT BY THE PHYSICIAN:

- PHOTOTYPE (Fitzpatrick) I-IV
- PRESENCE OF FRECKLES (EPHELIDES): NO / YES
- NUMBER OF NEVI: 1. <20, 2. 20-50, 3. 50-100, 4. >100
- DYSPLASTIC NEVI: NO / YES (NUMBER...../BY NO.)
- SOLAR LENTIGO: NO / YES (NUMBER.....OR LENTIGINOSIS)
- DIFFUSE ACTINICALLY DAMAGED SKIN: NO / YES
- ACTINIC KERATOSIS: NO / YES (NUMBER...../LOCATION.....)
- SUSP BCC: NO / YES (NUMBER...../LOCATION.....)
- SUSP SCC: NO / YES (NUMBER...../LOCATION.....)
- SUSP MELANOMA: NO / YES (NUMBER...../LOCATION.....)

**Figure 1.** Questionnaire completed by every triathlon participant and a board-certified dermatologist.

Almost 10% reported a positive family history of melanoma and one reported positive personal history of melanoma.

Skin examinations revealed that nearly half of the participants (46%) had solar lentigines, 25% had atypical nevi, while 2 participants presented with actinically damaged skin and 2 participants with actinic keratoses. The majority of the triathletes (around 57%) had less than 20 nevi on their skin, while only around 10% had between 50 and 100 nevi. No lesions that were suggestive of invasive skin cancer – non-melanoma skin cancer or melanoma – were identified.

UV exposure is usually exceeded in most activities performed outdoors with exposed skin, even if they are performed in sunny conditions for only a short amount of time. The limit for UV exposure was exceeded more than 30 times during the Ironman Triathlon World Championship 1999 in Hawaii, as reported by Moehrle. Additionally, despite the application of water-resistant sunscreen (SPF 25+), these triathletes showed sunburn on sun-exposed skin, which was most probably due to water exposure, sweating, and friction (5). Other studies evaluating skin cancer and sun protection habits of outdoor athletes indicate that most do not appear to be aware of the serious potential health risks of extensive sun exposure (6-8).

Even though no invasive skin cancer was detected in our athletes, a significant number of participants presented with solar lentigines and a fair amount with atypical nevi, both considered risk factors for skin cancer. Additionally, a large proportion of participants had a history of severe blistering sunburns, which is not surprising given that 20% never use sunscreen.

Our results indicate that it is necessary to advise and educate outdoor athletes about sun-smart behavior. Avoiding training and competing in periods with high sun exposure, wearing adequate clothing, and applying water-resistant high-protection sunscreen regularly and sufficiently are practices and habits that should be encouraged. Screening for skin cancer is a valuable measure and should be performed in high-risk individuals such as triathletes.

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