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Exposure to sunlight may decrease risk of advanced breast cancer by half

WINSTON-SALEM, N.C. - *October 18, 2007* - A research team from the Northern California Cancer Center, the University of Southern California, and Wake Forest University School of Medicine has found that increased exposure to sunlight – which increases levels of vitamin D in the body -- may decrease the risk of advanced breast cancer.

In a study reported online this week in the *American Journal of Epidemiology*, the researchers found that women with high sun exposure had half the risk of developing advanced breast cancer, which is cancer that has spread beyond the breast, compared to women with low sun exposure. These findings were observed only for women with naturally light skin color. The study defined high sun exposure as having dark skin on the forehead, an area that is usually exposed to sunlight.

The scientists used a portable reflectometer to measure skin color on the underarm, an area that is usually not directly exposed to sunlight. Based on these measurements, they classified the women as having light, medium or dark natural skin color. Researchers then compared sun exposure between women with breast cancer and those without breast cancer. Sun exposure was measured as the difference in skin color between the underarm and the forehead.

In women with naturally light skin pigmentation, the group without breast cancer had significantly more sun exposure than the group with breast cancer. The fact that this difference occurred only in one group suggests that the effect was due to differences in vitamin D production – and wasn't just because the women were sick and unable to go outdoors. In addition, the effect held true regardless of whether the cancer was diagnosed in the summer or in the winter. The difference was seen only in women with advanced disease, suggesting that vitamin D may be important in slowing the growth of breast cancer cells.

“We believe that sunlight helps to reduce women's risk of breast cancer because the body manufactures the active form of vitamin D from exposure to sunlight,” said Esther John, Ph.D., lead researcher on the study from the Northern California Cancer Center. “It is possible that these effects were observed only among light-skinned women because sun exposure produces less vitamin D among women with naturally darker pigmentation.”

These new findings about breast cancer risk and sun exposure based on skin color measurements are consistent with previous research by John and colleagues that had shown that women who reported frequent sun exposure had a lower risk of developing breast cancer than women with infrequent sun exposure.

The researchers stressed that sunlight is not the only source of vitamin D, which can be obtained from multivitamins, fatty fish and fortified foods such as milk, certain cereals and fruit juices. Women should not try to reduce their risk of breast cancer by sunbathing because of the risks of sun-induced skin cancer, they said.

“If future studies continue to show reductions in breast cancer risk associated with sun exposure, increasing vitamin D intake from diet and supplements may be the safest solution to achieve adequate levels of vitamin D,” said Gary Schwartz, Ph.D., a co-researcher from the Comprehensive Cancer Center at Wake Forest University School of Medicine.

“Since many risk factors for breast cancer are not modifiable, our finding that a modifiable factor, vitamin D, may reduce risk is important,” said Sue Ingles, Ph.D., a co-researcher from University of Southern California Keck School of Medicine.

The researchers compared 1,788 breast cancer patients in the San Francisco Bay area with a matched control group of 2,129 women who did not have breast cancer. They included non-Hispanic white, Hispanic and African-American women, thus women with a wide range of natural skin color and a wide range of capacity to produce vitamin D in the body. Skin color is an important factor that determines how much vitamin D is produced in the body after sun exposure. Dark-skinned individuals produce up to 10 times less vitamin D than light-skinned individuals for the same amount of time spent in the sun. People with darker skin are also more likely to be vitamin D deficient than people with lighter skin.

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The research team also included Wei Wang, Ph.D., of the University of Southern California Keck School of Medicine. The work was supported by grants from the National Cancer Institute and U.S. Department of Defense Medical Research Program.

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About the Northern California Cancer Center: The Northern California Cancer Center (www.nccc.org) is an established, nationally recognized leader dedicated to understanding the causes and prevention of cancer and to improve the quality of life for individuals living with cancer. NCCC has been working with scientists, educators, patients, clinicians, and community leaders successfully since 1974, and is an active

partner with Stanford University's Cancer Center. NCCC is a 501(c) 3 nonprofit with over 170 employees and a \$15 million operating budget.

Wake Forest University Baptist Medical Center is an academic health system comprised of North Carolina Baptist Hospital and Wake Forest University Health Sciences, which operates the university's School of Medicine. U.S. News & World Report ranks Wake Forest University School of Medicine 18th in primary care and 44th in research among the nation's medical schools. It ranks 35th in research funding by the National Institutes of Health. Almost 150 members of the medical school faculty are listed in Best Doctors in America.

The USC/Norris Comprehensive Cancer Center, located in Los Angeles, is a major regional and national resource for cancer research, treatment, prevention and education. Nearly 200 basic scientists, physicians and other Keck School of Medicine of USC faculty members who are members of the USC/Norris Cancer Center investigate the complex origins and progression of cancer, develop prevention strategies and search for cures. The National Cancer Institute (NCI) has designated the USC/Norris Cancer Center as one of the nation's 39 comprehensive cancer centers, a select group of institutions providing leadership in cancer treatment, research, prevention and education.