



# USRT Update 2010

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*A collaborative effort between the University of Minnesota School of Public Health, the National Cancer Institute, and the American Registry of Radiologic Technologists*

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The U.S. Radiologic Technologists (USRT) Study is a collaborative effort between the University of Minnesota, the National Cancer Institute, and the American Registry of Radiologic Technologists (ARRT). The long range goal of the study is to understand how repeated low-dose ionizing radiation exposure like that experienced by radiologic technologists is related to cancer and other health conditions. This study is unique in several ways. It is the largest and most comprehensive study of people who are exposed to ionizing radiation in medical jobs. The study is nationwide, representing all fifty states in the U.S., and the population is three-quarters female.

The past and ongoing participation of tens of thousands of radiologic technologists has enabled the USRT Study to provide critical information about the human health effects of ionizing radiation. This study began in 1983 when all radiologic technologists (RT) who were registered with the ARRT for at least two years were invited to participate. The study population of 146,000 technologists includes both current and former RTs certified in radiography, nuclear medicine, and/or radiation therapy. Since 1983, three questionnaire surveys were conducted and more than 70% of the study population responded to each survey. Selected sub-groups of responders were asked to provide additional information about their health history and about 9,500 participants donated a blood sample.

## **Genetic Determinants of Disease and Ionizing Radiation**

During the past year the USRT Study published results on breast and thyroid cancer, with a considerable emphasis on the genetic determinants of these diseases. The study team explored genetic markers that will help explain risks of breast cancer which may lead to a better understanding of how ionizing radiation affects individuals. For example, the risk of breast cancer is believed to be influenced by how hormones are regulated. Study researchers published a paper in 2009 that suggested that the genetic coding that controls the metabolism of estrogen modifies the risk of breast cancer associated with ionizing radiation. Other published papers explored new genetic markers for breast cancer and non-radiation related risk factors for thyroid cancer.

## **Studying Cancer Risk through Consortium Studies**

The size of the USRT Study and the quality of the information provided by the participants has positioned this study to be a key contributor to international collaborations, or consortium studies, to identify genetic risks for breast cancer. Discovering how the myriad of genetic variations may influence disease risk is a complex problem and requires studying large numbers of people with and without a particular disease. The well-characterized anonymous data from multiple studies are pooled to conduct consortium studies. The genetic information is used to discover new genetic markers of disease or confirm markers that were previously discovered. During the last year the USRT Study participated in several consortium studies for breast cancer and is now participating in studies of thyroid cancer. The contribution of the participants of the USRT Study is invaluable to these efforts to better understand disease.

## Studies of Skin Cancer Risk

To date, the USRT Study has mostly focused on risks for leukemia, breast, and thyroid cancers, plus a few non-cancer conditions. While the study team will continue to explore these important diseases, they will focus increasingly on evaluating skin cancers during the next few years. Cancer of the skin is the most common of all cancers and affects millions of people each year. Fortunately, the most common types of skin cancer, basal cell and squamous cell carcinomas, are highly curable. Melanoma is a less common but more serious form of skin cancer. Although most skin cancers are not fatal, these cancers carry a burden beyond the cost of treatment, including the inconvenience, anxiety, and additional time that goes along with on-going follow-up. In fact, skin cancers are now the fifth most costly cancer in Medicare patients because of their frequent occurrence.

## Ultraviolet Radiation, Vitamin D, and Cancer Risk

Exposure to ultraviolet radiation (UVR) from sunlight can increase a person's risk of getting some types of skin cancer, but the level of exposure at which there is no or minimal risk is unknown. An additional question is whether exposures to UVR from the sun and ionizing radiation at work can act together to increase the risk of skin cancer. The USRT Study presents a unique opportunity to address this issue as the participants live across the entire U.S., from Florida to Alaska, and are exposed to widely varying levels of sun exposure. While the effects of UVR can be damaging, exposure to sunlight also has known benefits; in particular the production of vitamin D. In recent years, both scientists and the general public have become increasingly interested in whether vitamin D protects against cancer and other diseases, but many questions remain. The USRT Study is playing an important role in answering some of these questions. During the past year more than 1,500 study participants from across the country provided blood samples that will help investigators understand the factors that contribute to the body's production of vitamin D. About 550 of them also donated a second blood sample in a different season.

Study researchers will examine how vitamin D levels vary according to gender, geographic location, and by season of year within individuals. Ultimately this information will be used to evaluate whether the risk of certain cancers and other diseases are affected by a person's vitamin D level.

## On-going participation of USRT Cohort Members

The ongoing success of the USRT Study is largely due to the astounding efforts of the women and men who have participated over the years. The information provided will greatly contribute to solving the complicated puzzles of cancer and other diseases.

*You can find more information about the USRT Study, including summaries and copies of the papers published in medical journals, using the navigation links on the study website (<http://www.radtechstudy.nci.nih.gov>).*

### Privacy

As a participant, you have provided us with personal information, and sometimes biological samples, that are vital to our efforts to evaluate potential health risks related to occupational radiation exposure. We are grateful for your trust and want to assure you that we take great care to protect your privacy and keep confidential all information you have provided to the study. Only authorized study personnel have access to your information and we do not share your name or other personal information with anyone outside the study. Furthermore, we have obtained a Certificate of Confidentiality on behalf of the Secretary of the Department of Health and Human Services that ensures that the researchers on this study cannot be forced to disclose any information about you that we collect as part of the genetic studies, including any DNA samples or the results of testing on these samples.