



## THYROID CANCER

### Risks of thyroid cancer associated with neck CT scans

#### BACKGROUND

Over the past few decades, the use of radiologic imaging studies has become increasingly popular. In particular, CT scans are commonly used in the diagnosis of a variety of medical problems. CT scans use ionizing radiation which, in high doses, increases the risk of cancers, specifically thyroid cancer; this has been studied extensively among survivors of atomic bombs, which also emit ionizing radiation, but at much higher energies. Thus, CT scans of the neck may predispose patients to developing thyroid cancer due to the direct exposure of the neck area during the procedure. This study used mathematical calculations to see how much radiation is absorbed by the thyroid during a neck CT scan. The calculations were then used to estimate the risk of developing thyroid cancer based on the patient's age and sex at the time of the neck CT scan.

#### THE FULL ARTICLE TITLE

Tipnis SV et al. Thyroid Doses and Risks to Adult Patients Undergoing Neck CT Examinations. *Am J Roentgenol* 2015 May;204(5):1064-8.

#### SUMMARY OF THE STUDY

This study was done at a single medical center of 68 adult patients who received a single neck CT scan. The researchers calculated the size of the patients' necks, thyroid glands, and how much radiation was absorbed by the thyroid gland as a result of the procedure. The main findings were that the dose of radiation corresponded to

the age and sex of the patient, with higher risks of thyroid cancer among patients who were younger and female. For example, a 20-year old woman had about 6 times the risk of developing thyroid cancer (0.2%) as a 20-year old man. These risks were lower in both men and women if they were older at the time of the neck CT scan.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The results of this study suggest that neck CT scans contribute some small, but increased, risks toward the development of thyroid cancer, especially in patients who are younger and female. The findings confirm what is already well-understood from studies of childhood survivors of atomic bombs, such as those which occurred at Chernobyl, Hiroshima, and Nagasaki. Patients who are concerned about the radiation risks of CT scans should discuss with their physician the risks and benefits of having the study done.

— Angela M. Leung, MD, MSc

#### ATA THYROID BROCHURE LINKS

Thyroid cancer: <http://www.thyroid.org/cancer-of-the-thyroid-gland>

Childhood Head and Neck Irradiation: <http://www.thyroid.org/pediatric-endocrinology>

#### ABBREVIATIONS & DEFINITIONS

**Ionizing radiation:** radiation that can damage cells, causing cell death or mutation. It can originate from radioactive materials, x-ray tubes or specialized machines. It is invisible and not directly detectable by human senses.

**Computerized tomography (CT) scans:** radiology xray study that operates by using ionizing radiation to get a picture of tissues of the body. CT scan are often done using contrast material that contains high amounts of iodine.