



## THYROID CANCER

### Development of new testing to determine which small thyroid cancers should be treated surgically

#### BACKGROUND

Papillary cancer is, by far, the most common type of thyroid cancer and, overall, has a very good survival rate/prognosis. Those unusual cases of papillary thyroid cancer having guarded/relatively poor prognosis generally have spread to other body sites, such as the neck lymph nodes, the lungs and/or the bones. In general, appropriate management for papillary thyroid cancer requires surgery, followed in some cases by treatment with radioactive iodine therapy.

Recent studies aimed at predicting the behavior of papillary thyroid cancer have found that very small cancers (< 1 cm in diameter, called papillary micro-carcinomas) are unlikely to grow and spread and probably do not need to be removed surgically. Rather, such small cancers might simply be monitored for growth, with surgery only performed if such growth occurs. Unfortunately, however, a very small number of papillary micro-carcinomas will spread to distant body sites, without actually growing themselves. Because of this, an important area of research focuses on identifying which papillary micro-carcinomas will spread to distant body sites, so that these specific cancers can be removed surgically before they spread.

Cancer cells develop because of genetic changes in the normal cells from which they arise. Additional genetic changes can then occur within these cancer cells, giving them the ability to spread to other body sites. Because of this, one strategy for identifying which papillary micro-carcinomas will spread out of the thyroid is to define which genetic changes allow this to occur and then to surgically remove only those papillary micro-carcinomas having these specific genetic changes.

The purpose of the study reviewed here was to compare the genetic changes in papillary micro-carcinomas that have spread out of the thyroid to the genetic changes in papillary micro-carcinomas that have remained within the thyroid.

#### THE FULL ARTICLE TITLE

Perera D et al 2019 Genomic and transcriptomic characterization of papillary microcarcinomas with lateral neck lymph node metastases J Clin Endocrinol Metab. Epub 2019 Jun 25. PMID: 31237614.

#### SUMMARY OF THE STUDY

To accomplish their study, the authors compared changes in genetic material (DNA and RNA) between 71 papillary micro-carcinomas having no evidence of spread out of the thyroid and 40 papillary micro-carcinomas known to have spread to neck lymph nodes. In so doing, the authors found no significant DNA differences between the two groups. However, significant RNA differences were identified in the group having known lymph node spread, when compared to the group without such spread. Moreover, the authors calculated that the absence of these RNA changes in a papillary micro-carcinomas confers a 98% probability that it will not spread out of the thyroid. Interestingly, the presence of these RNA changes did a relatively poor job of predicting which papillary micro-carcinomas will spread out of the thyroid.

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

It is clear that only a small subset of papillary micro-carcinomas will spread out of the thyroid and, in theory, only this subset should be surgically removed. Ideally, such surgery should be performed prior to the spread of cancer out of the thyroid, since such spread is associated with relatively poor prognosis and requires more aggressive treatment. The research reviewed here describes the development of a test allowing identification of those papillary micro-carcinomas that will not spread out of the thyroid. The results presented are encouraging and provide justification for further studies to validate the accuracy of the described testing.

— Jason D. Prescott, MD PhD





## THYROID CANCER, continued

### ATA THYROID BROCHURE LINKS

Radioactive Iodine Therapy: <https://www.thyroid.org/radioactive-iodine/>

Thyroid Cancer (Papillary and Follicular): <https://www.thyroid.org/thyroid-cancer/>

Thyroid Surgery: <https://www.thyroid.org/thyroid-surgery/>

### ABBREVIATIONS & DEFINITIONS

**Papillary Thyroid Cancer:** the most common type of thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

**Papillary Microcarcinoma:** a papillary thyroid cancer smaller than 1 cm in diameter.

**Cancer Metastasis:** spread of the cancer from the initial organ where it developed to other organs, such as the lungs and bone.

**Lymph Node:** bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

**Radioactive Iodine (RAI):** this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (*Thyroid Scan*) or to take pictures of the whole body to look for thyroid cancer (*Whole Body Scan*).

**Negative Predictive Value:** the likelihood that a patient does not have a disease when the test used to diagnose that disease is negative.

**Positive Predictive Value:** the likelihood that a patient has a disease when the test used to diagnose that disease is positive.

