

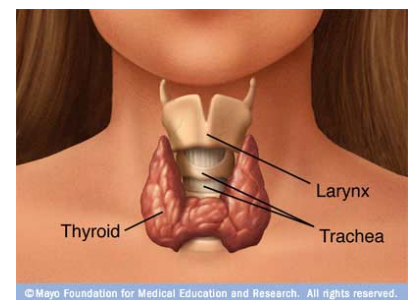
Moving Beyond Cancer Treatment

Dedicated to Living after Cancer

Thyroid Problems After Cancer

Anatomy of the thyroid gland:

The thyroid gland is located in the front of the neck, below the larynx (voice box). The small, two-inch gland consists of two lobes, one on each side of the windpipe, connected by tissue called the isthmus. The thyroid tissue is made up of two types of cells: follicular cells and parafollicular cells. Most of the thyroid tissue consists of the follicular cells, which secrete iodine-containing hormones called thyroxine (T4) and triiodothyronine (T3). The parafollicular cells secrete the hormone calcitonin. The thyroid needs iodine to produce the hormones.



Functions of the thyroid gland:

The thyroid plays an important role in regulating the body's metabolism and calcium balance. The T4 and T3 hormones stimulate every tissue in the body to produce proteins and increase the amount of oxygen used by cells. The harder the cells work, the harder the organs work. The calcitonin hormone works together with the parathyroid hormone to regulate calcium levels in the body. Levels of hormones secreted by the thyroid are controlled by the pituitary gland's thyroid-stimulating hormone, which in turn is controlled by the hypothalamus (*University of Maryland Medical Center. All rights reserved. University of Maryland Medical Center 22 South Greene Street Baltimore, Maryland 21201.800.492.5538*.)

Effects of Cancer Treatment

Some treatments given for adult cancer may affect the thyroid gland. Thyroid problems may occur shortly after radiation, but generally do not occur until several years later. If treated promptly, thyroid problems are easily managed. Regular check-ups may help discover thyroid problems early so that the proper treatment can be started. Damage to the thyroid gland after cancer is usually the result of radiation to the brain or neck. Several different types of thyroid problems may develop including an underactive thyroid (hypothyroidism), overactive thyroid (hyperthyroidism), and growths on the thyroid that may be benign (nodules) or malignant (cancer).

Who is at risk for thyroid problems?

People who received radiation that may have affected the thyroid gland directly are at risk for primary hypothyroidism, compensated hypothyroidism, hyperthyroidism, thyroid nodules, and/or thyroid cancer. People who received radiation that may have affected the pituitary gland in the brain are at risk for central hypothyroidism.

Other factors that have been shown to increase the risk of thyroid problems following cancer include being:

- Female
- Treated with higher radiation doses
- Treated at a young age

Steps to protect your health

Since thyroid problems may occur many years after cancer treatment, a yearly check-up is recommended for survivors who are at risk of developing thyroid problems. This check-up should include palpation (feeling) of the thyroid gland and a blood test to measure the levels of TSH and T4.

Female survivors at risk for thyroid problems who are planning to become pregnant should have their thyroid levels checked *before attempting pregnancy*. This is important to do before becoming pregnant, because mothers with thyroid disease have a higher possibility of having babies with developmental problems. Thyroid levels must also be monitored periodically throughout pregnancy.

If problems with thyroid levels are identified, you may be referred to an endocrinologist (hormone specialist) for continuing treatment. If a lump is detected on the thyroid, you may be referred to a surgeon or other specialist for evaluation and management.

POTENTIAL PROBLEMS and TREATMENTS

Hypothyroidism

Hypothyroidism occurs when the thyroid gland is underactive, resulting in insufficient production of thyroid hormones. This is the most common thyroid problem seen in cancer survivors. In this condition thyroid hormone levels are low and the body's metabolism slows down. Signs and symptoms of hypothyroidism may include increased sensitivity to cold, constipation, dry skin, puffiness of the face and hands, hoarse voice, elevated cholesterol level, weight gain, muscle and joint aches, weakness, and depression.

There are three different types of hypothyroidism seen in cancer survivors:

- **Primary hypothyroidism** is caused by direct damage to the thyroid gland. Blood tests in people with primary hypothyroidism show a high TSH.
- **Central hypothyroidism** is caused by damage to the pituitary gland in the brain. Blood tests in people with central hypothyroidism show low TSH, T3 and T4 levels.
- **Compensated hypothyroidism** occurs when the pituitary gland has to overwork the thyroid gland to keep the level of thyroid hormones normal in the blood. This may be a temporary problem after radiation, or it may be a sign that the thyroid gland is beginning to fail. Blood tests in people with compensated hypothyroidism show higher than normal TSH levels and normal T3 and T4 levels. Some survivors with compensated hypothyroidism may be treated with thyroid hormone in order to decrease the workload on the thyroid gland.

All types of hypothyroidism are treated with daily thyroid pills. Treatment is usually for life. In some cases of compensated hypothyroidism, treatment may be stopped if the thyroid gland begins to function normally.

Hyperthyroidism

Hyperthyroidism occurs when the thyroid gland is overactive, resulting in excessive production of thyroid hormones. In this condition thyroid hormone levels are high and the body's metabolism speeds up. Signs and symptoms of hyperthyroidism may include weight loss, rapid or irregular heartbeat, nervousness, heat intolerance, increased sweating, fatigue, bulging or protruding eyes (exophthalmos), frequent bowel movements, irregular menstrual periods, and enlarged thyroid gland (goiter).

Hyperthyroidism may be treated in several ways. Sometimes medication is given on a temporary basis to prevent excess thyroid hormone production. Radioactive iodine therapy is the most common form of treatment. Taken by mouth, radioactive iodine causes the gland to shrink and

thus destroys the hormone-producing cells in the gland. In a few cases, surgery to remove the thyroid gland is recommended. Your healthcare provider will determine which treatment option is the best choice for you. Treatment for hyperthyroidism may result in hypothyroidism, which is then treated with a daily thyroid pill.

Thyroid Nodules

These growths may occur many years after radiation to the thyroid gland. They usually begin as slow-growing, painless lumps in the neck. Typically, most thyroid growths do not cause any symptoms. Thyroid growths that are palpated on physical exam require additional testing. This is generally done with an ultrasound (picture made using sound waves) and biopsy (sampling the thyroid tissue to check for cancer cells). Surgery may be performed to remove enlarging nodules because of the concern about thyroid cancer.

Thyroid Cancer

Like thyroid nodules, thyroid cancer also usually occurs many years after radiation to the thyroid gland, does not cause any symptoms, and is first noticed as a slow-growing, painless lump. Treatment for thyroid cancer involves surgery to remove the cancer and as much additional normal thyroid tissue as the surgeon feels is necessary. After surgery, additional treatment with radioactive iodine (I-131) may be needed to destroy any remaining thyroid tissue. Most individuals will need to take daily thyroid pills following surgery.