



**APSA**  
American Pediatric  
Surgical Association  
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## Thyroid Cancer

*Patient and family information, brought to you by the Education Committee of APSA*

### Overview - “What is it?”

Thyroid cancer is a cancer that involves the thyroid gland, a butterfly-shaped gland in the front part of the neck. The thyroid makes hormones that are important for growth, metabolism, and control of calcium levels in the body.

Thyroid cancer is the third most common solid tumor malignancy in children. It occurs four times more commonly in females compared to males. Some risk factors for the development of thyroid cancer include history of radiation and chemotherapy. Other types of cancer (medullary thyroid cancer) are common in certain families.

### Signs and Symptoms - “What symptoms will my child have?”

The most common presentation is a firm, non-painful neck mass in the location of the thyroid gland. This may be accompanied by swollen lymph nodes, difficulty swallowing. Less commonly, a fullness in the neck, persistent hoarseness or difficulty swallowing may be experienced.

### Diagnosis - “What tests are done to find out what my child has?”

If you are worried regarding symptoms that we mentioned previously, you should take a child to a doctor who can perform a careful examination of the head and neck area which would include the thyroid and the surrounding lymph nodes to check for lumps.

#### **Types of Thyroid Cancer:**

- **Papillary:** This form of thyroid cancer arises from cells that make thyroid hormone. This cancer grows slowly but can spread to the lymph glands close to the thyroid (80% of the time). It can rarely spread to other organs such as the lungs (20% of the time) and other structures of the neck such as the esophagus, neck muscles and airway (30%). It is the most common type of thyroid cancer in children.

- **Follicular:** This type of cancer also comes from the cells that make thyroid hormone. It spreads through blood vessels and therefore, more commonly spreads to sites of the body away from the neck.
- **Medullary Thyroid Cancer (MTC):** This more aggressive type of cancer occur in cells within the thyroid gland that control calcium levels. It is seen more commonly within families with a specific genetic mutation (RET gene) such as multiple endocrine neoplasia type 2 (MEN 2). These cancers occur in younger children and can be very aggressive. If your family has known MEN 2, it is important to have your baby examined even at a very young age (age less than one year) in order to treat this cancer before it spreads. In fact there are certain inheritable changes in specific chromosomes that are classified as the highest risk of MTC. In these cases, thyroid removal is recommended before one year of age.
- **Anaplastic:** This form of cancer is not seen in children. It is fast growing and can be fatal.

**Lab Tests:** A blood test may be performed to see how well the thyroid is functioning.

**Ultrasound of the thyroid:** consists of examining the gland with sound waves and a computer, can determine characteristics of the lump—such as its location, whether it contains fluid (cyst), or whether other lumps exist.

**Radioactive iodine scan:** looks at whether or not the mass takes up iodine. Sometimes masses that do NOT take up iodine are more likely to be cancerous.

In some situations, a fine needle aspirate is performed, where a doctor inserts a needle directly into the mass and removes a sample of the cells. Another doctor will examine the cells under the microscope to determine whether they are cancerous. Sometimes it is necessary to remove part of the gland with the tumor in order to help with the diagnosis and treatment of the problem.

If MEN 2 is a disease process in your family, it is mandatory that your child be tested for the possibility that he or she inherited the abnormal chromosome. The type of RET gene abnormality will determine when surgery should be performed.

**Conditions that mimic this condition:** Other tumors or growths arising from the neck need to be ruled out, including other thyroid masses or enlarged lymph nodes.

## Treatment - “What will be done to make my child better?”

### Surgery:

- Most cases of papillary and follicular thyroid cancer start with thyroid lobectomy (removal of the half of the thyroid that contains the disease). This aggressive approach in children is because there is a higher chance of thyroid cancer in children compared to adults, and a fine needle aspiration may miss cancerous tumors from the mass. At the

time of the thyroid lobectomy, the sample containing the tumor is frozen and examined under a microscope. If papillary or follicular cancer is seen and confirmed, removal of the rest of the gland performed. Removal of the rest of the gland is performed because extensive disease, higher rates of spread, and recurrences are more common in children. Sometimes the pathologist (doctor who examines the cells under the microscope) cannot definitively make a call with regard to the presence of cancer using this quick technique. If so, he or she will need to do more extensive tests which may take a few days. If cancer is seen, then the other half of the thyroid is removed as soon as possible, before scarring of the operative site can occur.

- If lymph nodes are involved, then they need to be removed.
- If *follicular* cancer is small (less than 1.5 cm in its largest dimension), a lobectomy may be considered.
- In MTC, most children between 3-5 years of age should have RET testing, thyroid ultrasound and a blood test to check their calcitonin levels, and thyroid removal before age of five years. However, some types of RET abnormalities (“D types”) put the patients at such high risk that surgery to remove the thyroid is recommended before age one.

**Preoperative preparation:** No special preparation is needed. The child should shower or bathe the night before or the morning of surgery.

**Postoperative care:** Your child may require an overnight hospitalization or may require a hospital stay for a couple of days. Some surgeons leave a small drain in the surgical bed to allow excess fluid to be removed. Your child will be checked for evidence of bleeding (neck swelling), nerve injury (hoarseness), and low calcium levels for several hours after surgery.

**Risks/Benefits:** Risks of surgery include bleeding in the hours immediately following surgery. This manifests as swelling in the neck, and if there is a lot of blood, it may compress the airway and cause difficulty breathing. This occurs rarely, but will require an emergent operation to evacuate the blood clot and find the bleeding vessel. Another complication is injury to the nerves around the thyroid. These nerves control the muscles of the voice box and may cause hoarseness. The injury may be temporary or permanent. The thyroid is located very close to the other glands that also control calcium levels (parathyroid glands). These glands may be injured or removed at the time of the surgery; calcium levels may go down after thyroid surgery. Calcium blood levels will be checked. Symptoms of low calcium include numbness or tingling around the face, mouth and fingertips.

**Radioactive Iodine Therapy:** For *papillary* and *follicular* cancer, radioactive iodine therapy is usually performed six weeks or so after surgery to destroy remaining cancer cells. The iodine is concentrated by the remaining thyroid cells, and the radiation specifically kills remaining thyroid cells.

**Chemotherapy:** If the cancer has spread to other parts of the body, drugs may be required to stop or slow down the growth of the cancer.

**Radiation therapy:** Some forms of cancer may require radiation.

## Home Care - “What do I need to do once my child goes home?”

**Diet:** Usually the child can be on a regular diet appropriate for age when he or she goes home.

**Activity:** If your child had a biopsy only, regular activity can be resumed about two days after surgical procedure. Regular activity can resume slowly a few days after surgery.

**Wound care:** Specific wound care issues should be addressed with your child’s surgeon. Usually wounds are kept dry for about three days, then child may shower. Soaking the wound (such as baths or swimming) should wait until a week after surgery.

**Medicines:** Medicines for pain such as acetaminophen (Tylenol®) or ibuprofen (Motrin® or Advil®). Stronger pain medications like a narcotic may be needed to help with pain for a few days after surgery. Stool softeners and laxatives are needed to help regular stooling after surgery, especially if narcotics are still needed for pain.

If your child required removal of the entire thyroid gland, he or she will require thyroid hormone replacement to help normalize his or her growth and metabolism. Thyroid hormone also slows down the growth of thyroid cells, which may be present.

If your child has persistent low calcium levels, he or she will need calcium supplements.

**What to call the doctor for:** A call to the surgeon should be done if there is worry about infection (unexplained fevers, redness and drainage of the wound). If your child experiences numbness and/or tingling around the fingers and the face, you should call the surgeon or endocrinologist as well.

**Follow-up care:** A wound check is often performed in 2-3 weeks after surgery. Often, the child’s oncologist can also provide follow-up of the wound as well.

## Long Term Outcomes - “Are there future conditions to worry about?”

Future outcomes for this type of cancer are excellent. The best outcomes are seen in teenage girls, papillary type of tumor, and tumors localized to the thyroid gland.

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