



## A Review On: Thyroid Cancer

Pravin S. Pawar <sup>\*1</sup>, Afroj A. Shaikh<sup>2</sup>, Kanchan M. Jambhale<sup>3</sup>

<sup>1</sup>Department of Pharmacology, HSBPVT, GOI, Faculty of Pharmacy, Kashti,  
Shrigonda 413701, India

<sup>2</sup>Department of Pharmacology, HSBPVT, GOI, Faculty of Pharmacy, Kashti,  
Shrigonda 413701, India

<sup>3</sup>Assistant Professor at HSBPVT, GOI, Faculty of Pharmacy, Kashti,  
Shrigonda 413701, India

### \*Corresponding Author

Name: Mr. Pravin S. Pawar

Contact: +91 91685 92395

Email: afrojs952@gmail.com

ORCID: <https://orcid.org/0000-0001-9189-9848>

### Abstract

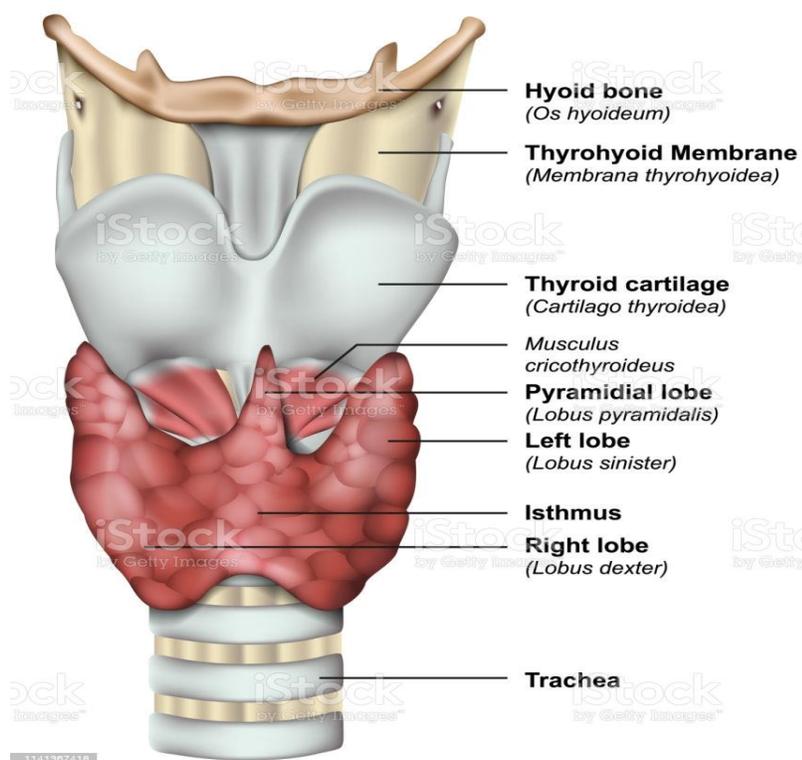
Thyroid cancer is uncommon with an estimated lifetime risk of 0.8% for women and 0.3% for men. The incidence appears to be increasing by 4% per year and is currently the eighth commonest cancer in women. Thyroid cancer is one of the rarest forms of cancer, and yet there are wide variations in the degree of malignancy, ranging from the most rapidly fatal to the relatively benign. This difference depends almost entirely on the histological type. Despite that thyroid cancer accounts for over 90% of tumors that arise from the endocrine system, these tumors barely represent 2% of solid tumors in adults. Many entities are grouped under the general term of thyroid cancer, and they differ in Histological features as well as molecular and clinical behavior. Thus, the prognosis for patients with thyroid cancer ranges from a survival rate of >97% at 5 years, in the case of differentiated thyroid tumors sensitive to radioactive iodine, to a 4-month median survival for anaplastic tumors.

**Keywords:** Thyroid Cancer, Thyroid Gland, Clinical studies, Different Types, symptoms .

## Introduction

In this review research we will study all about thyroid cancer. Thyroid cancer was discovered by Caleb Parry in 1786, but the pathogenesis of thyroid disease was not discovered until 1882-86. Thyroid cancer is a cancer that affects the thyroid organ in the neck. Thyroid cancer is cancer that develops from the tissue of the thyroid gland. It is a disease in which cells grow abnormally and have the potential to spread to other parts of the body. There are four main types of Thyroid Cancer: Papillary, Follicular, Anaplastic and Medullary. The first symptom of thyroid cancer is a nodule in the thyroid region of the neck. The thyroid gland is in the front part of the neck, below the thyroid cartilage. In most people, the thyroid cannot be seen or felt. It is shaped like a butterfly, with 2 lobes the right lobe and the left lobe joined by a narrow piece of gland called the isthmus. The thyroid gland has 2 main types of cells. Glands that release hormones into the blood stream are called endocrine glands the thyroid is the largest endocrine gland of the body. There are two types of thyroid hormone tri-iodothyronine T3 and thyroxine T4. These hormones control the speed at which the cells work (metabolism), and are important in brain development and growth in children. The amount of thyroid hormone in the blood stream is controlled by the pituitary gland. Thyroid Cancer can occur at any age, it is most common in people aged 40–60 years. Doctors can't explain why a person gets cancer. The two main causes of Thyroid Cancer are being a Female and Age.

## Structure of Thyroid Gland:



**Figure 1: Thyroid Gland**

## **Risk factor:**

Factors that may increase the risk of thyroid cancer include

### **1. Female sex**

Thyroid cancer occurs more in women as compare to men.

### **2. Radiation**

Radiation therapy treatment to head & neck increase the risk of thyroid cancer.

### **3. Genetic Syndromes**

Increase the risk of thyroid cancer.

## **Cause:**

Thyroid cancer occurs when cells in thyroid undergo genetic changes Known as mutations. The mutations allow the cells to grow and multiply rapidly. The cells also lose the ability to die as normal cells can die. The abnormal cells can invade nearby tissue and can spread to other parts of the body.

## **Sing & Symptoms:**

As thyroid cancer grows, it may cause

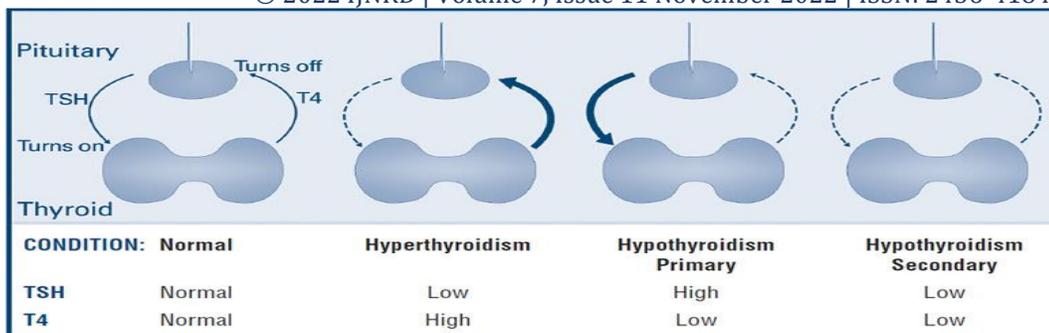
1. A lump (nodule) that can be felt through the skin on your neck
2. Changes to voice, including increasing hoarseness
3. Difficulty in swallowing
4. Pain in r neck and throat
5. Swollen lymph nodes in neck.

**(Thyroid cancer generally does not cause any signs or symptoms early)**

## **Diagnosis**

### **1. Hormones and Antibody Blood Test:**

These tests are help to identify Thyroid hormone level in blood but that can be ordered if you have any sign or symptoms or other harmful factors



**Figure 2: Function & Test Brochure**

Some common Thyroid blood test included:

- Thyroid-stimulating hormone
- Total T4
- Free T4
- Total tri-iodothyronine
- Free tri-iodothyronine
- Reverse T3
- Thyroid binding globulin
- Antithyroglobulin Antibodies
- Thyroid-stimulating immunoglobulin
- Thyroid Receptor Antibodies
- Anti-Thyroid peroxidase Antibodies \

## 2. Thyroid Ultrasound:

Nodules, lumps can visualize by thyroid ultrasound and enlargement of your gland.

## 3. MRI or CT Scans:

A clear picture of larger thyroid nodules or goiter can be provided by CT scan. It clearly identify the size and shape of thyroid.

## 4. Radioactive Iodine Uptake:

Radioactive Iodine uptake test having one another name know as RAI-U. it help to detect signs of grave disease, toxic effects on body. RAI-U primarily take during pregnancy period.

## 5. Fine Needle Aspiration Biopsy:

Fine Needle Aspiration Biopsy (FNA) also known as Needle biopsy. Suspicious thyroid lumps and nodules are evaluated by FNA Biopsy. In FNA biopsy, a thin needle is injected directly into the nodule which is help to withdrawn cells. These cells are evaluated in laboratory for cancer identification.

## Treatment

Very small thyroid cancers that have a low risk of spreading in the body might not need treatment.

**1) Surgery :**

Most people with thyroid cancer undergo surgery to remove the thyroid. When the thyroid cancer is spread to more portion in such condition surgery is very important treatment. Thyroid surgery carries a risk of bleeding and infection. Damage to your parathyroid glands also can occur during surgery, which can lead to low calcium levels in your body.

**2) Thyroid hormone therapy**

Thyroid hormone therapy has two benefits: It supplies the missing hormone to thyroid would normally produce, and it suppresses the production of thyroid stimulating hormone from your pituitary gland. High level of thyroid-stimulating hormone could stimulate any remaining cancer cells to grow.

**3) Radioactive iodine:**

Radioactive iodine treatment is used after thyroidectomy to destroy any remaining cancer thyroid tissue, as well as microscopic areas of thyroid cancer that weren't removed during surgery. Radioactive iodine treatment may also be used to treat thyroid cancer that recurs after treatment or that spreads to other areas of the body.

**4) External radiation therapy**

Radiation therapy can also be given externally using a machine that aims high energy beams such as X-rays and protons. Radiation therapy may also be recommended after surgery if there is an increased risk that cancer will recur.

**5) Targeted drug therapy**

Targeted drug treatments focus on specific abnormalities present within cancer cells. By blocking these abnormalities, targeted drug treatments can cause cancer cells to die.

**6) Injecting alcohol into cancers :**

Alcohol ablation involves injecting small thyroid cancers with alcohol using injection. Alcohol ablation might be an option if cancer is very small and surgery isn't an option.

**Conclusion**

Thyroid cancer is more common in women than in men. Thyroid cancer is one of the rarest cancer type .The treatment of thyroid cancer depend on the tumor type and its stage at the time of diagnosis. Many thyroid cancers remain stable, microscopic, and indolent. Early diagnosis and appropriate treatment can improve diagnosis and reduce mortality. Generally Thyroid cancer occurs when cells in thyroid undergo genetic changes.

## References

1. National Cancer Institute. SEER stat fact sheets thyroid cancer. <http://seer.cancer.gov/statfacts/html/thyro.html>. January 12, 2015.
2. National Cancer Institute. Thyroid cancer treatment . July 11, 2014. <http://cancer.gov/cancertopics/pdq/treatment/thyroid/HealthProfessional>. January 12, 2015.
3. National Cancer Registry Ireland. Cancer of the thyroid. National Cancer Registry, 2012 <https://www.ncri.ie/publications/cancer-trends-and-projections/cancer-trends-cancers-thyroid>
4. Williams E.D.Guest editorial: two proposals regarding the terminology of thyroid tumors. 2000 <https://journals.sagepub.com/doi/10.1177/106689690000800304>
5. World Health Organisation. Obesity and overweight [Internet]. Geneva: WHO Media Centre; 2015. Available from: <http://who.int/mediacentre/factsheets/fs311/en>.
6. What Is New in Thyroid Cancer: The Special Issue of the Journal Cancer; by Efisio Puxeddu, Giovanni Tallini and Roberta Vanni Cancers 2020 <https://doi.org/10.3390/cancers12103036>
7. Radiation-Induced Thyroid Cancers: Overview of Molecular Signatures; by Keiji Suzuki, Vladimir Saenko, Shunichi Yamashita and Norisato Mitsutake Cancers 2019 <https://doi.org/10.3390/cancers11091290>
8. Thyroid Cancer: Molecular Aspects and New Therapeutic Strategies Enrique Grande, Juan José Díez, Carles Zafon , and Jaume Capdevila <https://www.hindawi.com/journals/jtr/2012/847108/>
9. Diagnosis and Treatment of Patients with Thyroid Cancer Quang T. Nguyen, DO, FACP, FACE, FTOS, Eun Joo Lee, [...], and Raymond A. Plodkowski, MD <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4415174/>
10. Effect of Thyroid Cancer Marcin Barczy Commentary: Journal of Thyroid Disorders & Therapy, 2021 <https://www.longdom.org/thyroid-disorders-therapy.html>
11. Thyroid surgery for differentiated thyroid cancer — recent advances and future directions Tracy S. Wang & Julie Ann Sosa Nature Reviews Endocrinology <https://www.nature.com/articles/s41574-018-0080-7>
12. Thyroid cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment S. Filetti C. Durante D. Hartl M.G. Papotti A. Berrutithe ESMO Guidelines Committee [https://www.annalsofoncology.org/article/S0923-7534\(20\)32555-2/fulltext](https://www.annalsofoncology.org/article/S0923-7534(20)32555-2/fulltext)
13. Nikiforov YE, Nikiforova MN, Molecular genetics and diagnosis of thyroid cancer. Nature reviews. Endocrinology. 2011 Aug 30 <https://pubmed.ncbi.nlm.nih.gov/21878896/>
14. Current Knowledge in Thyroid Cancer—From Bench to Bedside Daniela Grimm <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5536017/>
15. Differentiated Thyroid Cancer: How Do Current Practice Guidelines Affect Management ? Owens P.W.a · McVeigh T.P.a,b · Fahey E.J.a · Bell M.c · Quill D.S.a · Kerin M.J.a · Lowery A.J.a <https://www.karger.com/Article/Fulltext/493261>
16. Thyroid Cancer ; Christine Allen, in xPharm: The Comprehensive Pharmacology Reference, 2007 <https://www.sciencedirect.com/topics/medicine-and-dentistry/thyroid-cancer>
17. Thyroid Carcinoma: Epidemiology, Histology, and Diagnosis Jatin P. Shah, MD <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5526593/>
18. Molecular pathogenesis and mechanisms of thyroid cancer Mingzhao Xing <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3791171/>

19. Thyroid Cancer Symptoms, Diagnosis, and Treatments . Written by Gary Clayman, DMD, MD, FACS. <https://www.endocrineweb.com/conditions/thyroid-cancer/thyroid-cancer>
20. Thyroid Cancer ;Angela Greco, ... Marco A. Pierotti, in Cancer Genomics, 2014 , <https://www.sciencedirect.com/topics/medicine-and-dentistry/thyroid-cancer>
21. Diagnosis and Management of an Anaplastic Thyroid Cancer: Case Report I. Made Pande Dwipayana<sup>1</sup>, Prima Yogi<sup>1</sup>, Siswadi Semadi<sup>1</sup>, Suma Wirawan<sup>2</sup> and Ketut Widian. <https://biomedpharmajournal.org/vol10no3/diagnosis-and-management-of-an-anaplastic-thyroid-cancer-case-report/>
22. Thyroid cancer ,Author links open overlay panel, CosimoDuranteMD <https://www.sciencedirect.com/science/article/abs/pii/S0140673616301726>
23. *Tests for Thyroid Cancer*. (n.d.). Retrieved from [www.cancer.org](http://www.cancer.org): <https://www.cancer.org/cancer/thyroid-cancer/detection-diagnosis-staging/how-diagnosisd.html>
24. *Thyroid Function Tests*. (n.d.). Retrieved from [www.thyroid.org](http://www.thyroid.org): <https://www.thyroid.org/thyroid-function-tests/>