



An Overview of Thyroid Diseases

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✧ What's the thyroid?

✧ What does the thyroid do?

✧ Thyroid Disease- The "Hidden" Health Problem

✧ Hyperthyroidism

✧ Hypothyroidism

✧ Thyroid Nodules

✧ Who's at risk?

✧ Diagnosis & treatment

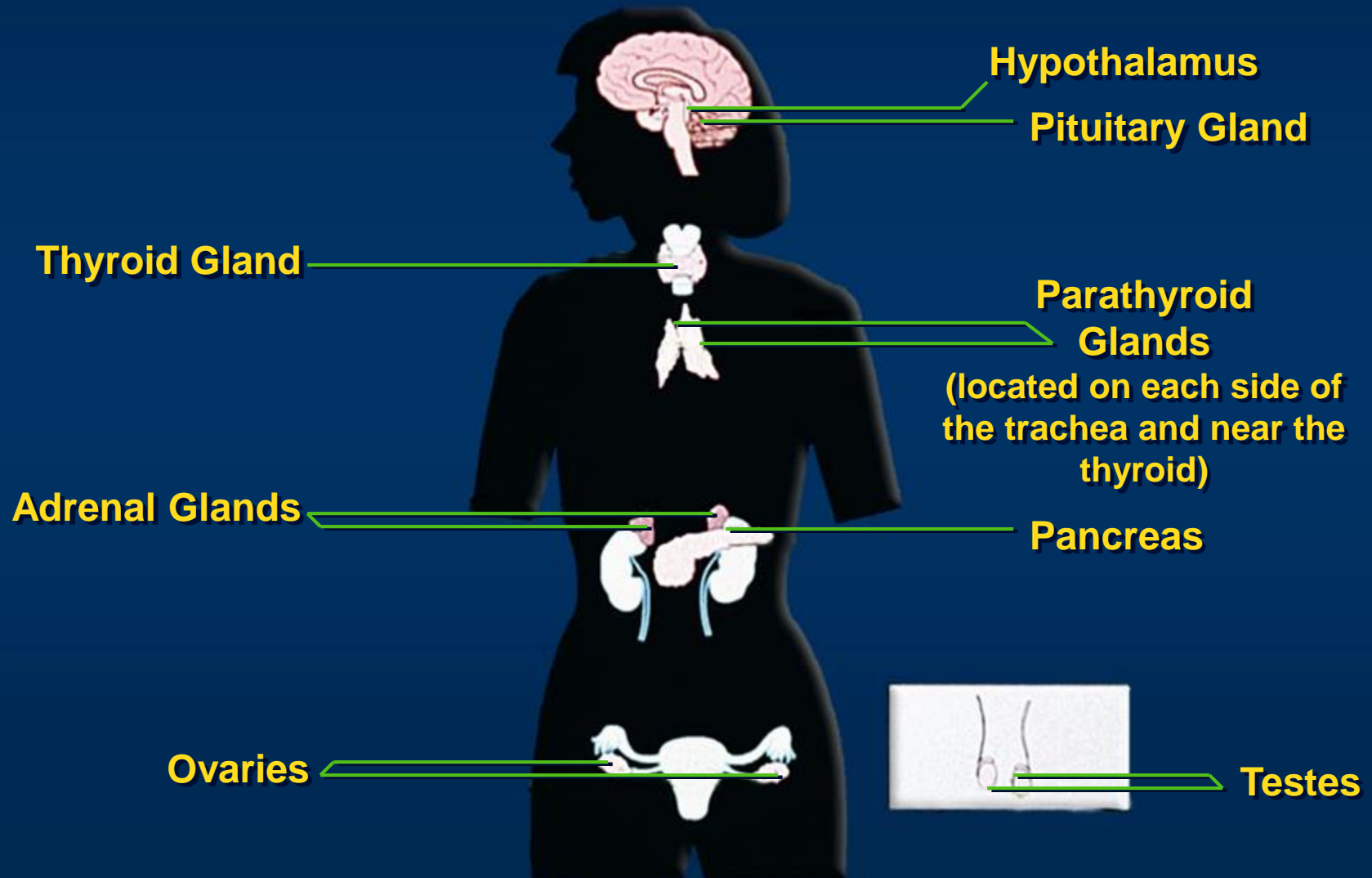


What Are Hormones?

- Chemicals : are secreted by glands and released into the bloodstream
- Regulators of specific body functions



The Endocrine System





What's the Thyroid?

- ✧ A small, butterfly-shaped gland at the base of the Adam's Apple
- ✧ The “engine” that regulates the body's speed
- ✧ If your thyroid is malfunctioning, so are you!

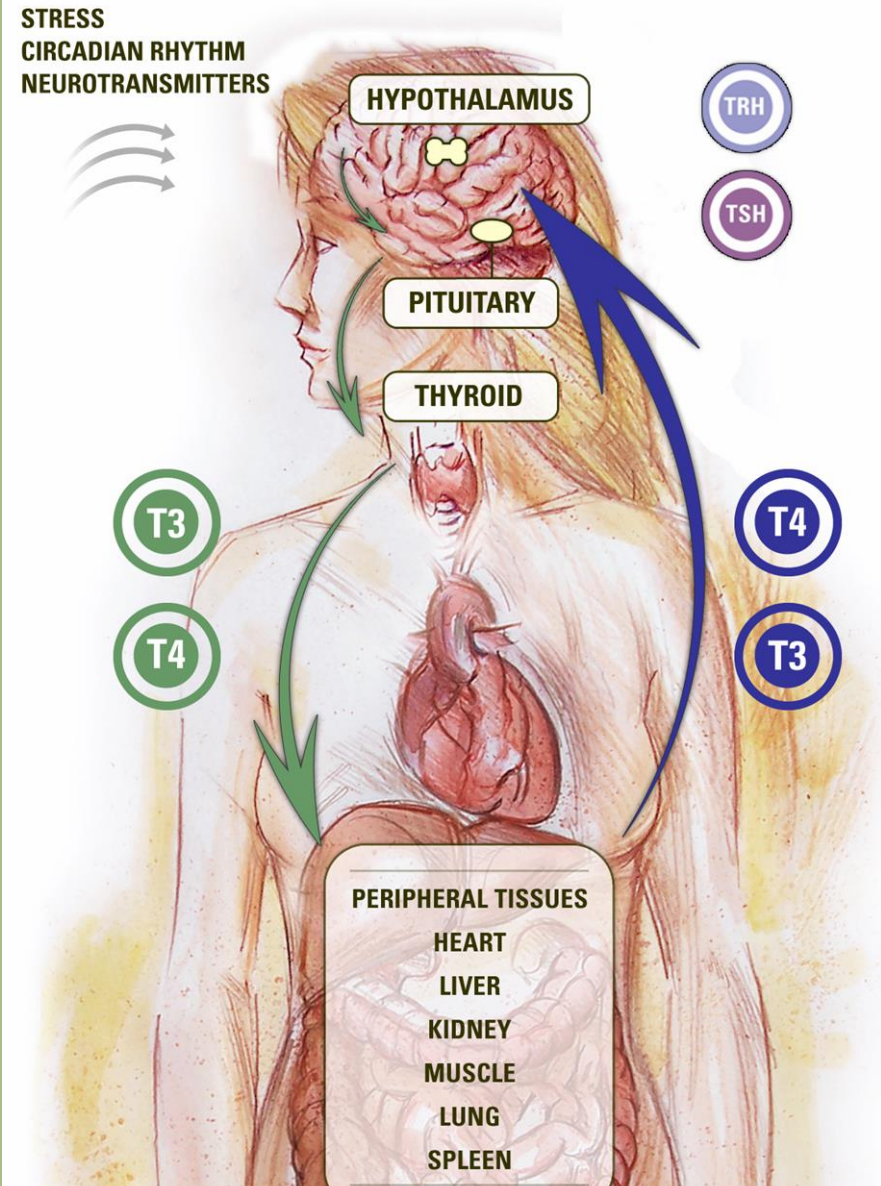


What does the thyroid do?

- ✧ Extracts iodine (“the fuel”) from the bloodstream
- ✧ Produces two thyroid hormones called:
 - ✧ Thyroxine (T4)
 - ✧ Triiodothyronine (T3)
- ✧ Secretes thyroid hormone into the bloodstream
- ✧ Affect every cell, tissue and organ in the human body



The Role of the Pituitary Gland

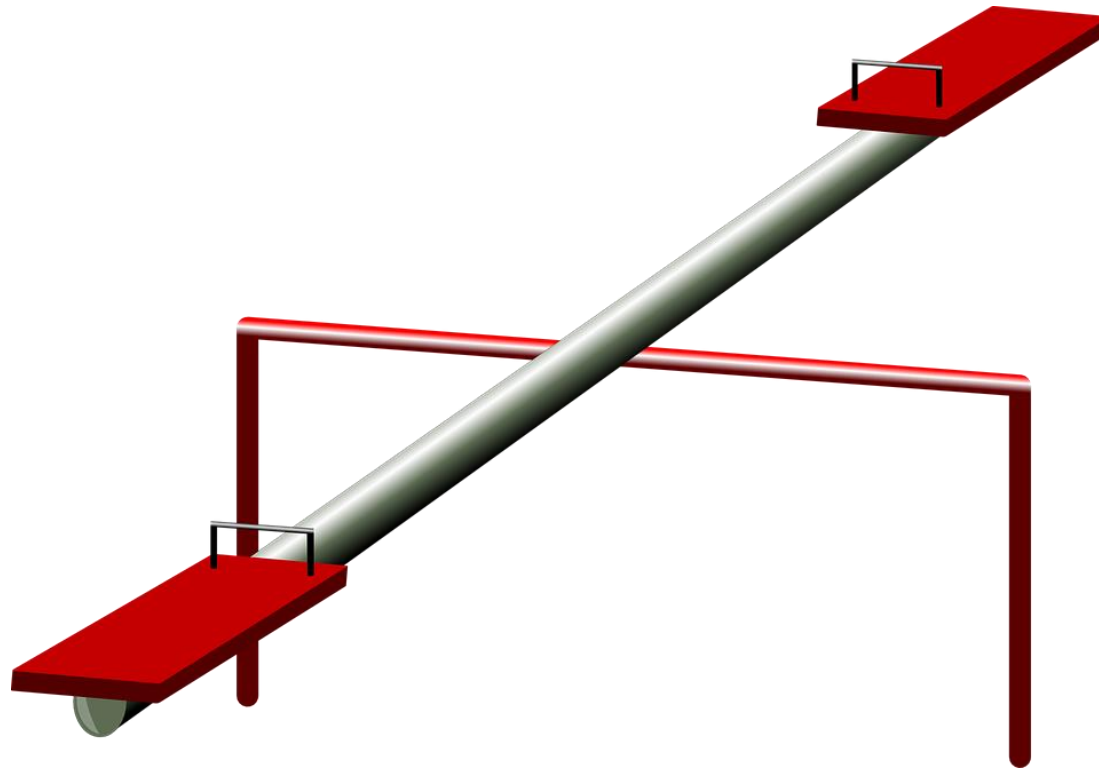


- ✧ Known as the “Master Gland”
 - ✧ Controls all the glands in the endocrine system
- ✧ Acts as the thyroid’s “accelerator”
 - ✧ Sends messages in the form of *thyroid-stimulating hormone* (TSH)
 - ✧ These messages tell the thyroid how much thyroid hormone to produce
- ✧ **TSH levels rise or fall based on the amount of thyroid hormone being produced**





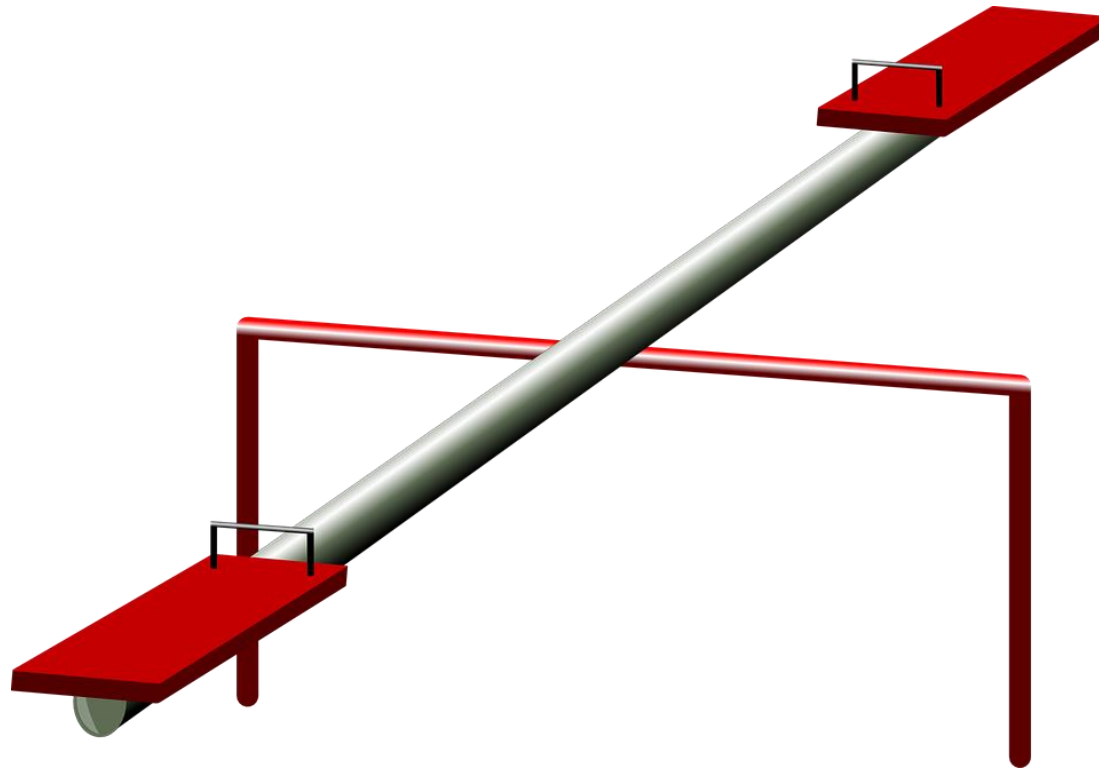
TSH is High



T4 is Low



T4 is High



TSH is Low



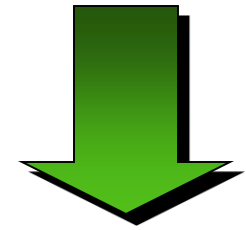
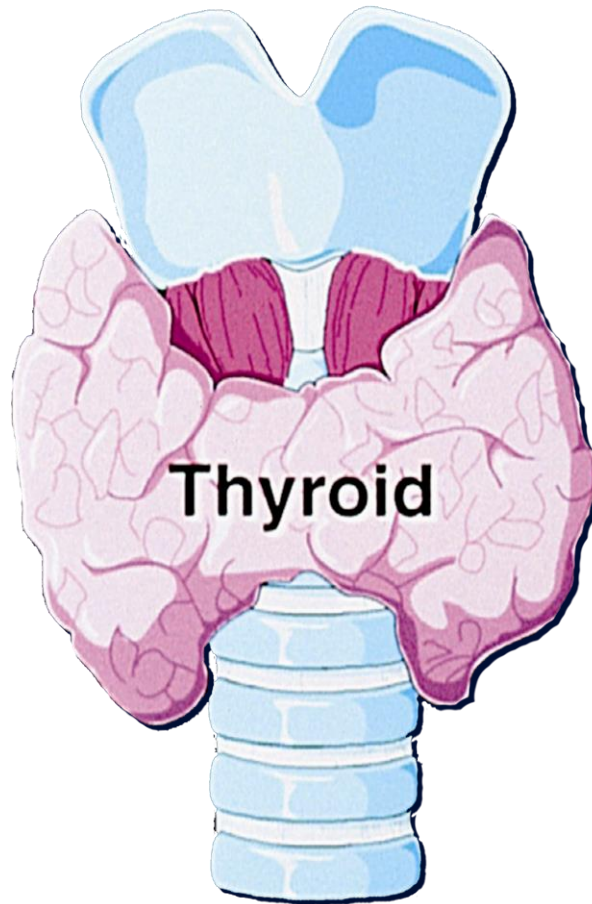


Thyroid Disease- The “Hidden” Health Problem



Hyperthyroidism

- ✖ Too much thyroid hormone
- ✖ Metabolism speeds up



Hypothyroidism

- ✖ Not enough thyroid hormone
- ✖ Metabolism slows down



Hyperthyroidism



- ✧ Overproduction of thyroid hormone, causing metabolism acceleration
- ✧ Affects roughly 1% of the U.S. population or two million Americans
- ✧ Graves' Disease
 - ✧ Most common form of hyperthyroidism
 - ✧ Autoimmune disorder



Symptoms of Hyp



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Treating Thyroid Disorders

Hyperthyroidism

- ✦ Radioiodine Therapy
- ✦ Stop thyroid hormone production
 - ✦ Anti-thyroid drugs
- ✦ Surgery
- ✦ Treatment tailored to patient's needs

Graves Disease: Therapy

- Medical therapy with methimazole
 - Use propylthiouracyl (PTU) only in the 1st trimester of pregnancy
 - PTU has been associated with irreversible hepatocellular necrosis and death
- Radioactive iodine therapy
- Surgery: thyroidectomy



Medical Therapy: Methimazole

Advantages



- 25-30% of patients achieve remission, esp. small goiter
- Can be use in pregnancy
- Can be use in breast feeding
- Can be use in children

Disadvantages



- Pruritus, rash
- Arthralgia
- Agranulocytosis, neutropenia
- Liver dysfunction

Radioactive iodine therapy



- Definitive therapy
- No association with cancer and birth defects in nonpregnant females (always ✓ hCG)
- Hypothyroidism
- Rarely, radiation thyroiditis (transient)
- ? worsening of ophthalmopathy
- Cannot be use during pregnancy or breast feeding
- Caution in children

Graves Disease: Surgery



- Rapid resolution of hyperthyroid state



Complications:

- Hypothyroidism
- Recurrence
- Bleeding, infection
- Hypoparathyroidism
- Vocal cord paralysis



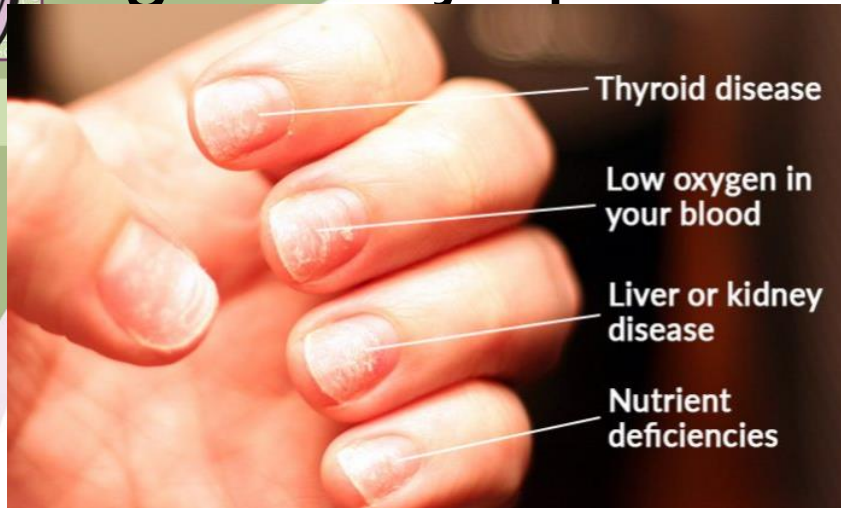
Hypothyroidism



- ✧ Underproduction of thyroid hormone, causing metabolism to slow
- ✧ Affects up to 25 million Americans, approximately twelve million remain undiagnosed
- ✧ Hashimoto's Thyroiditis
 - ✧ Most common thyroid disease in the U.S.
 - ✧ Autoimmune disease



Signs & Symptoms of Hypothyroidism



- Lethargy
- Dry Skin (Coarse & Scaly)
- Muscle Aches & Weakness
- Constipation
- Anorexia



In this patient with advanced pretibial myxedema, these striking skin changes are due to accumulations of mucopolysaccharides ("myxedema"). These changes are reversible with thyroid hormone.



“Hidden” features of Hypothyroidism:



Cardiovascular:

Slow heartbeat

Elevated Cholesterol

Aging:

Dry, Scaly Skin

Sparse or Coarse Hair

Gynecological:

Irregular Menstruation

Infertility

Ear, Nose & Throat:

Hoarse Voice

Gastrointestinal:

Constipation

Weight Gain

Psychiatric:

Impaired Concentration

Depression

Lethargy, Fatigue

Muscular:

Muscle Weakness

Stiffness

Blood:

Anemia



Remembering the Signs & Symptoms of Hypothyroidism

Sleepiness, Fatigue

Loss of Memory, Trouble Concentrating

Unusually Dry Skin

Goiter

Gradual Personality Change, Depression

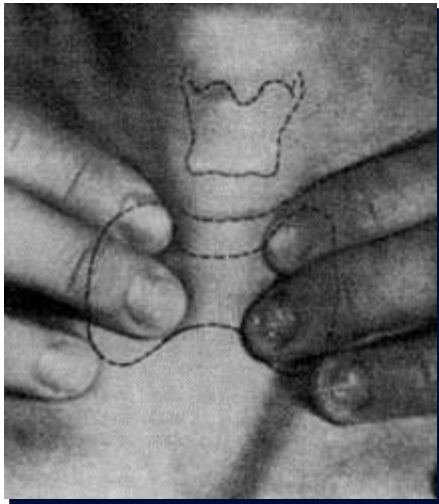
Increase in Weight

Sensitivity to Cold

Hair Loss



Diagnosing Hypothyroidism



- Family and personal medical history
 - Hypothyroidism may be Hereditary
- Physical exam
 - MD observes the patient
 - Palpates the thyroid
 - Interviews patient
- Laboratory Tests
 - TSH
 - Free T4

Who's at Risk?



✧ Women over 40

✧ Five to seven times more likely to develop Hashimoto's Thyroiditis than men

✧ Women 20-50

✧ Graves' Disease



Treating Thyroid Disorders

Hypothyroidism

- ✦ Daily oral medications replace missing hormone
- ✦ Individualized dosage adjustment
- ✦ Annual monitoring

Hypothyroidism in Pregnancy



- Levothyroxine requirement increases by 33% in the first trimester of pregnancy
- Ask to be notified when your female patient is pregnant to check TSH and adjust levothyroxine dose
- Subclinical hypothyroidism during pregnancy decreases the child's IQ by a mean of 10 points
- Check TSH + free T₄ q4-8 weeks during pregnancy



How's *Your* Thyroid?

- ❖ Tell your doctor when symptoms arise
- ❖ Ask your doctor for a TSH Test and Free T4
Women over 40, make it part of your medical routine
- ❖ Take medication as directed
 - ❖ Take Thyroid medication separately from iron, calcium, and multivitamins
- ❖ Do Not change brand or generic or dose of medication
- ❖ If symptoms persist, tell your doctor



When visiting your physician...

- ✧ Prepare questions in advance
- ✧ Don't hesitate to ask them
- ✧ Observe good health practices: eat properly & exercise
- ✧ Bring your medications



Don't Let Your Thyroid Slow You Down

- ✧ Know the signs & symptoms
 - ✧ Alert your doctor
 - ✧ Ask for a TSH Test and a measure of free T4
- ✧ Take medication only as directed
- ✧ Don't skip your medicine —
 - ✧ Consistency is key
- ✧ Don't switch brand or dose
- ✧ Take the time to take care of yourself!!!

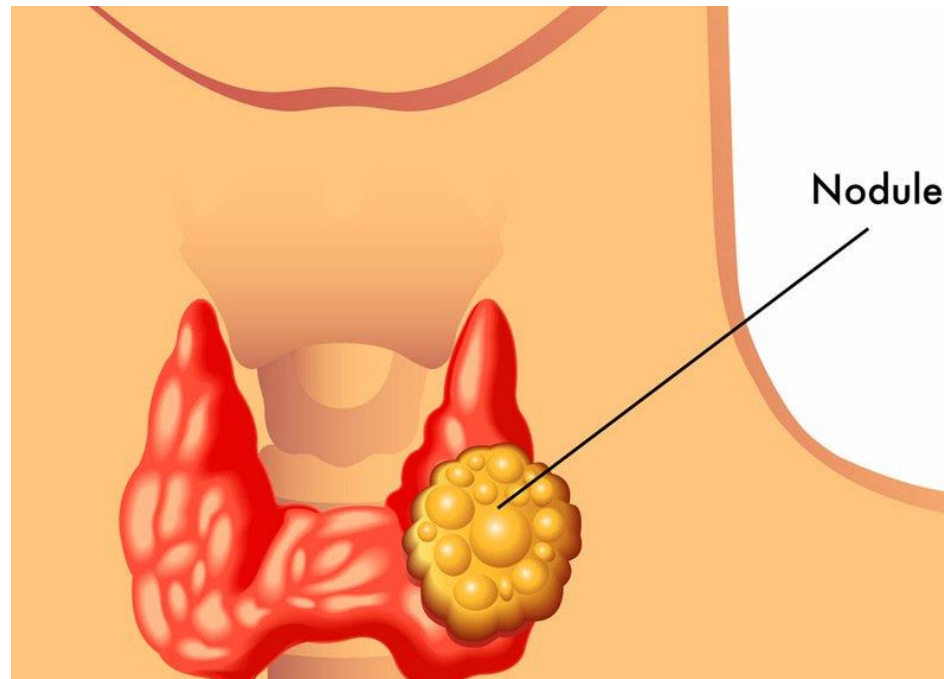






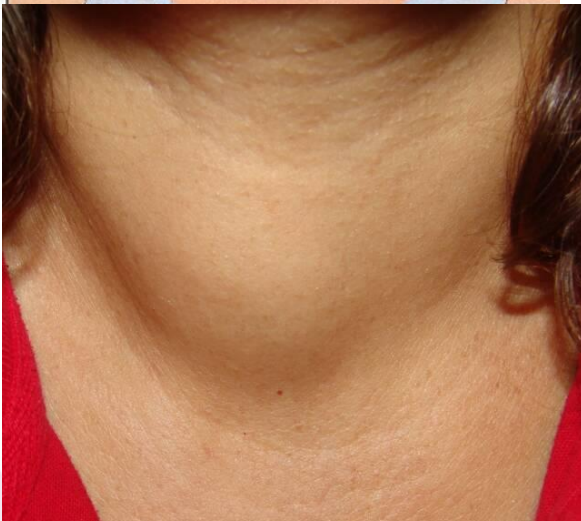
Thyroid Nodule

- A discrete lesion within the thyroid gland that is palpably and/or ultrasonographically distinct from the surrounding thyroid tissue





Types of thyroid nodules



- Adenoma
- Nodular goiter
- Hyperplasia
- Carcinoma
- Benign or malignant cyst
- Inflammatory thyroid disease
(Subacute and Hashimoto's thyroiditis)



Thyroid Self Test

Focus on the area of your neck just below the Adam's apple and immediately above the collarbone. Your thyroid gland is located in this area of your neck.



While focusing on this area in the mirror, tilt your head back.



Now swallow a sip of water.



As you swallow, look at your neck. Check for any bulges or protrusions in this area.

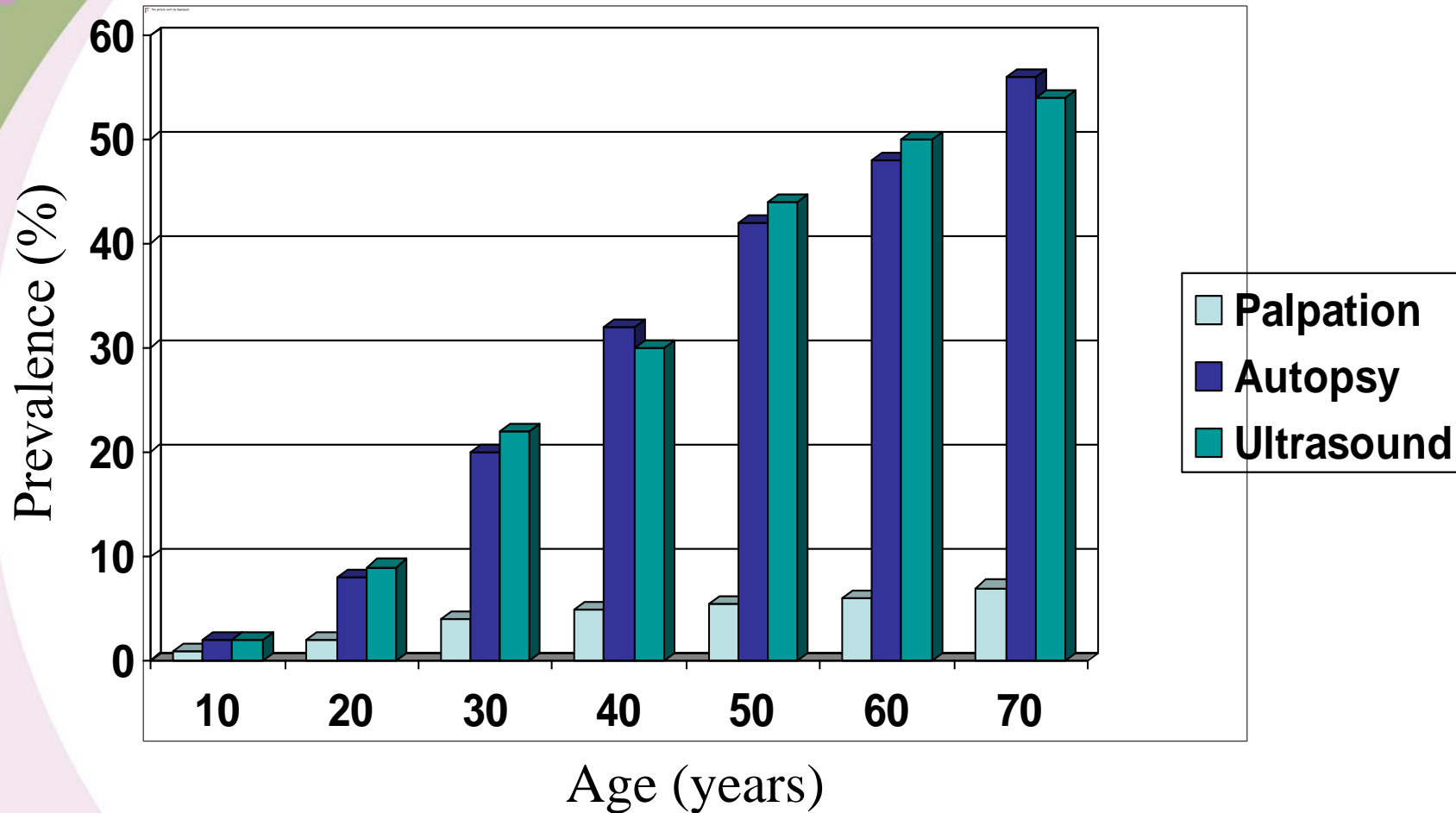


Talk to your doctor immediately, if you see any bulges or protrusions in this area.





Prevalence of thyroid nodules





Factors associated with an increased prevalence of thyroid nodules

- Female sex
- Increasing age
- Exposure to ionizing radiation
- Iodine deficiency
- Family history



Legacy of the Chernobyl Disaster



“Patient lies prepared for surgery at a thyroid clinic in Minsk, Belarus. About 4,000 people who were children at the time of the disaster have contracted thyroid cancer as a result of the burning reactor's large releases of radioactive iodine 131, which effectively targets the thyroid. Luckily, the isotope has only an eight-day half-life, so it quickly diminished to negligible levels in the environment, limiting the health damage.”

National Geographic April 2006

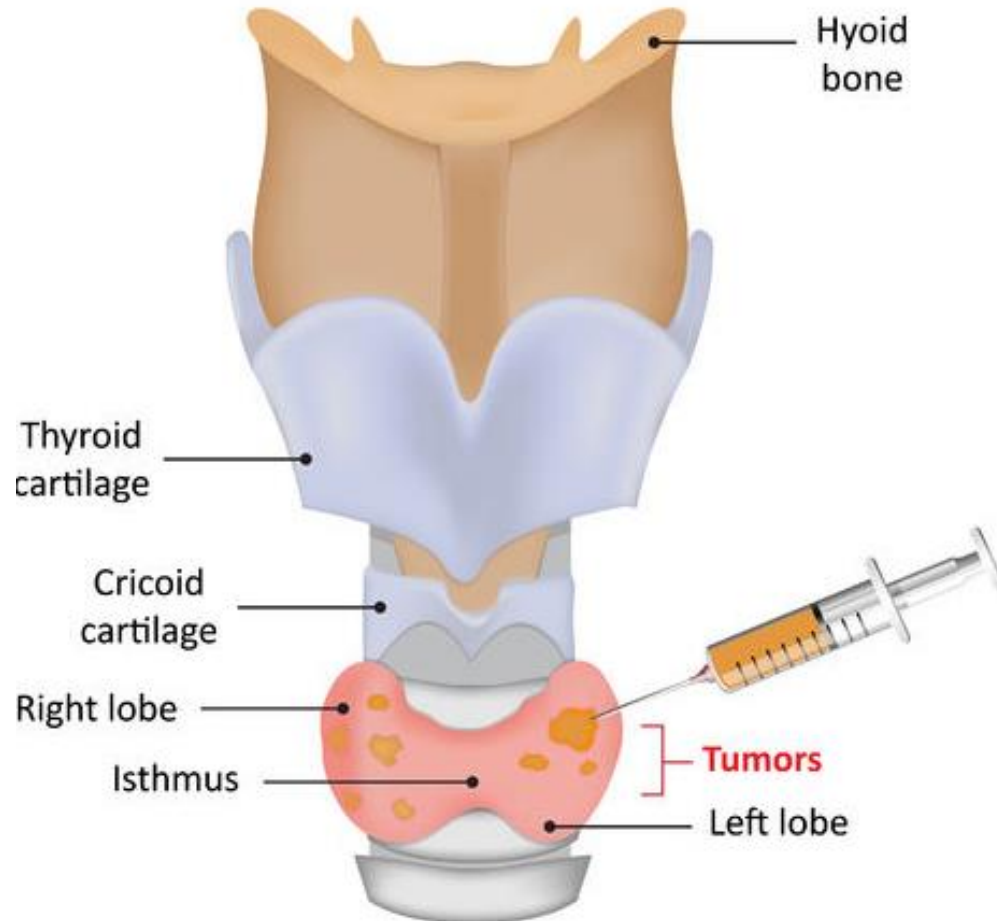


Thyroid nodule: Laboratory Evaluation

- Blood test: TSH to screen for hyper- or hypothyroidism
- Obtain a thyroid ultrasound
- Fine needle aspiration biopsy of thyroid nodule if it meets criteria
 - Small nodules are common and don't need to be biopsied

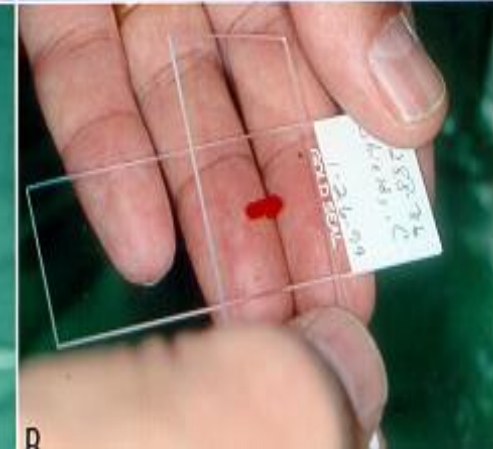
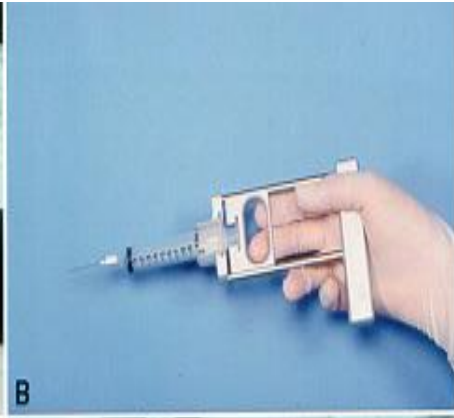


Fine-needle aspiration





Fine-needle aspiration



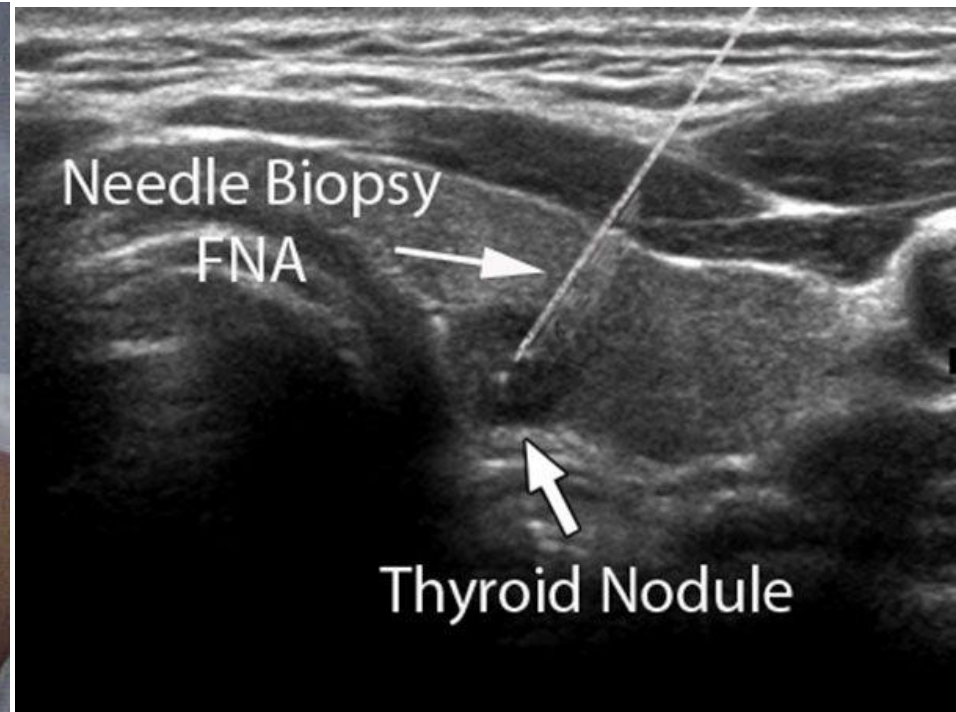


Thyroid Ultrasonography





Ultrasound-Guided FNA (US-FNA)





Which nodule to biopsy

High Suspicion 70-90%	<p>microcalcifications hypoechoic nodule irregular margin</p>	<p>hypoechoic irregular margins</p>	<p>hypoechoic taller than wide</p>	<p>hypoechoic, irregular margins, extrathyroidal extension</p>	<p>hypoechoic, interrupted rim calcification with soft tissue extrusion</p>	<p>nodule with irregular margins, suspicious left lateral lymph node</p>
Intermediate Suspicion 10-20%	<p>hypoechoic solid regular margin</p>	<p>hypoechoic solid regular margin</p>				
Low Suspicion 5-10%	<p>hyperechoic solid regular margin</p>	<p>isoechoic solid regular margin</p>	<p>partially cystic with eccentric solid area</p>	<p>partially cystic with eccentric solid areas</p>		
Very low Suspicion <3%	<p>spongiform</p>	<p>partially cystic no suspicious features</p>	<p>partially cystic no suspicious features</p>			

Risk of malignancy ↑

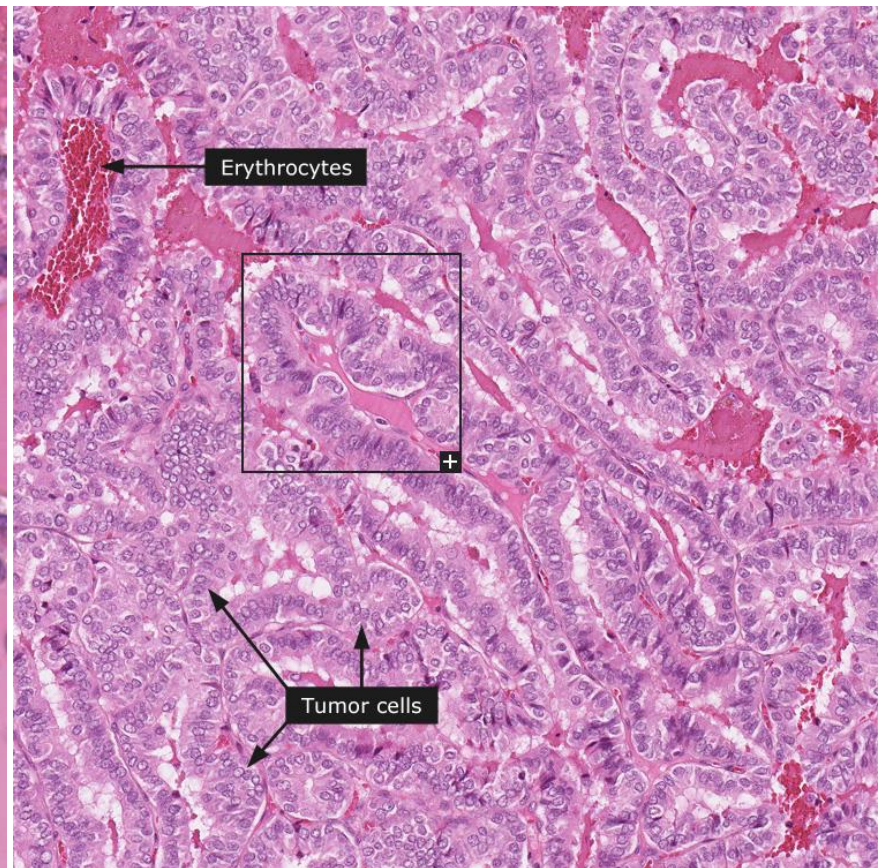


Cytology

Normal



Cancer







- Most thyroid nodules are not cancer
- Only 1-5 % of nodules are thyroid cancer



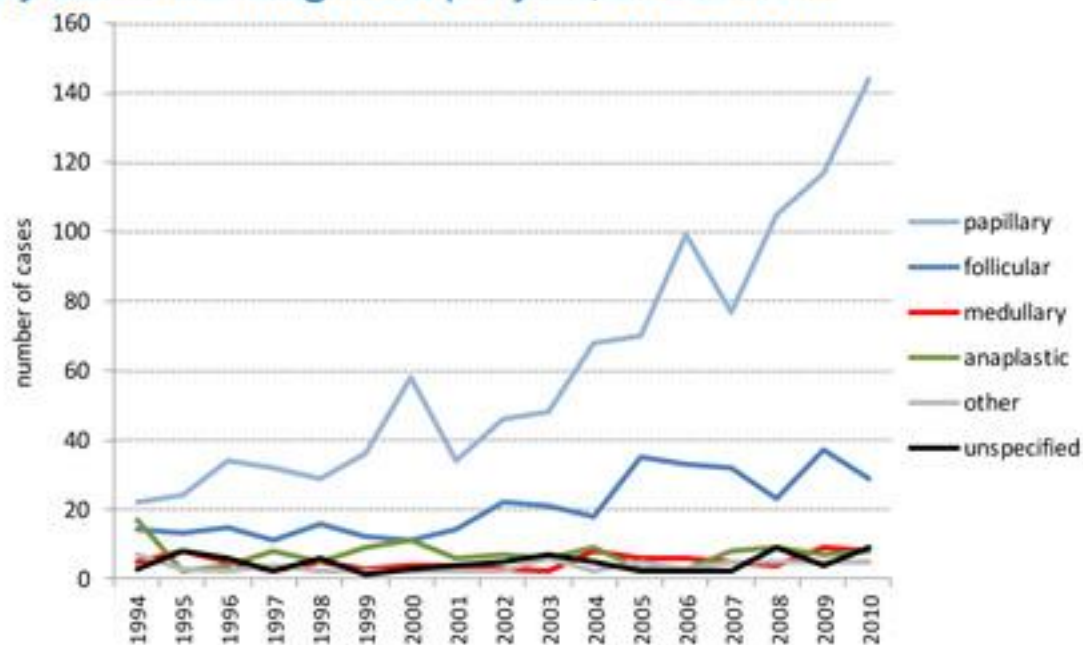
Thyroid Cancer: A few statistics

- Fastest rising incidence among cancers in the US, with new cases increasing at a rate of approx 4% annually
- Occurs three times more often in women
- Over 350,000 people in the US are living with a diagnosis of thyroid cancer
- 58% of thyroid cancer are diagnosed while the cancer is still confined to the primary site (localized stage)
- 35% are diagnosed after the cancer has spread to regional lymph nodes or directly beyond the primary site
- 5% are diagnosed after the cancer has metastasized to distant organs



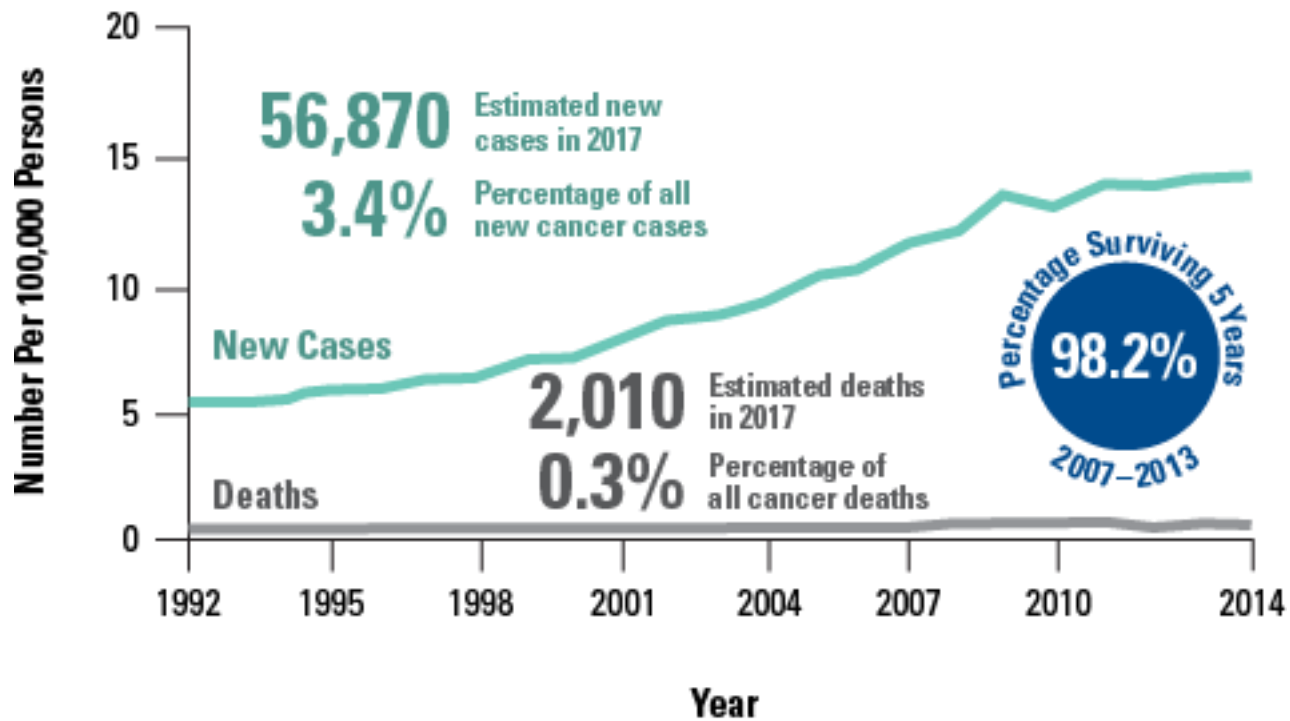
Thyroid Cancer

Figure 4. Total number of the main histological subtypes of thyroid cancer diagnosed per year, 1994–2010





Thyroid Cancer





Few things people should know about thyroid

- ✦ Up to 30 million Americans may be affected by thyroid disorders
 - ✦ More than half remain undiagnosed
- ✦ Thyroid disorders are more common amongst women
- ✦ Thyroid disorders tend to run in the family
- ✦ TSH testing is the most useful test for thyroid screening



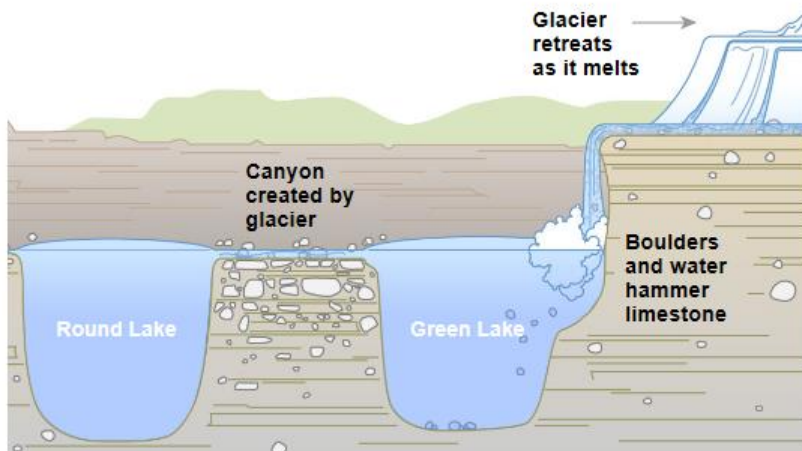
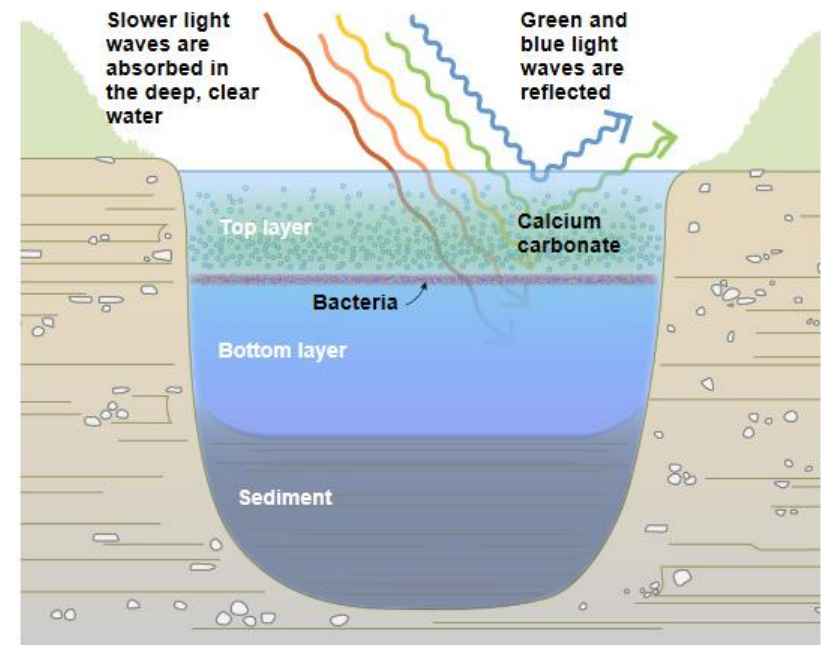
Few things people should know about thyroid

- ✧ Regular check-ups are the key
- ✧ Changing brands or generics and dosage should be followed by retesting
- ✧ Do not change the dose without guidance from your physician
- ✧ Thyroid conditions in pregnancy warrant close attention
- ✧ Thyroid cancer is *one* of the fastest growing cancers in America, and one of the most curable





Why the water looks green





For more information:

✈ Visit us on the web at:

✈ www.thyroid.org

✈ www.thyroidawareness.com