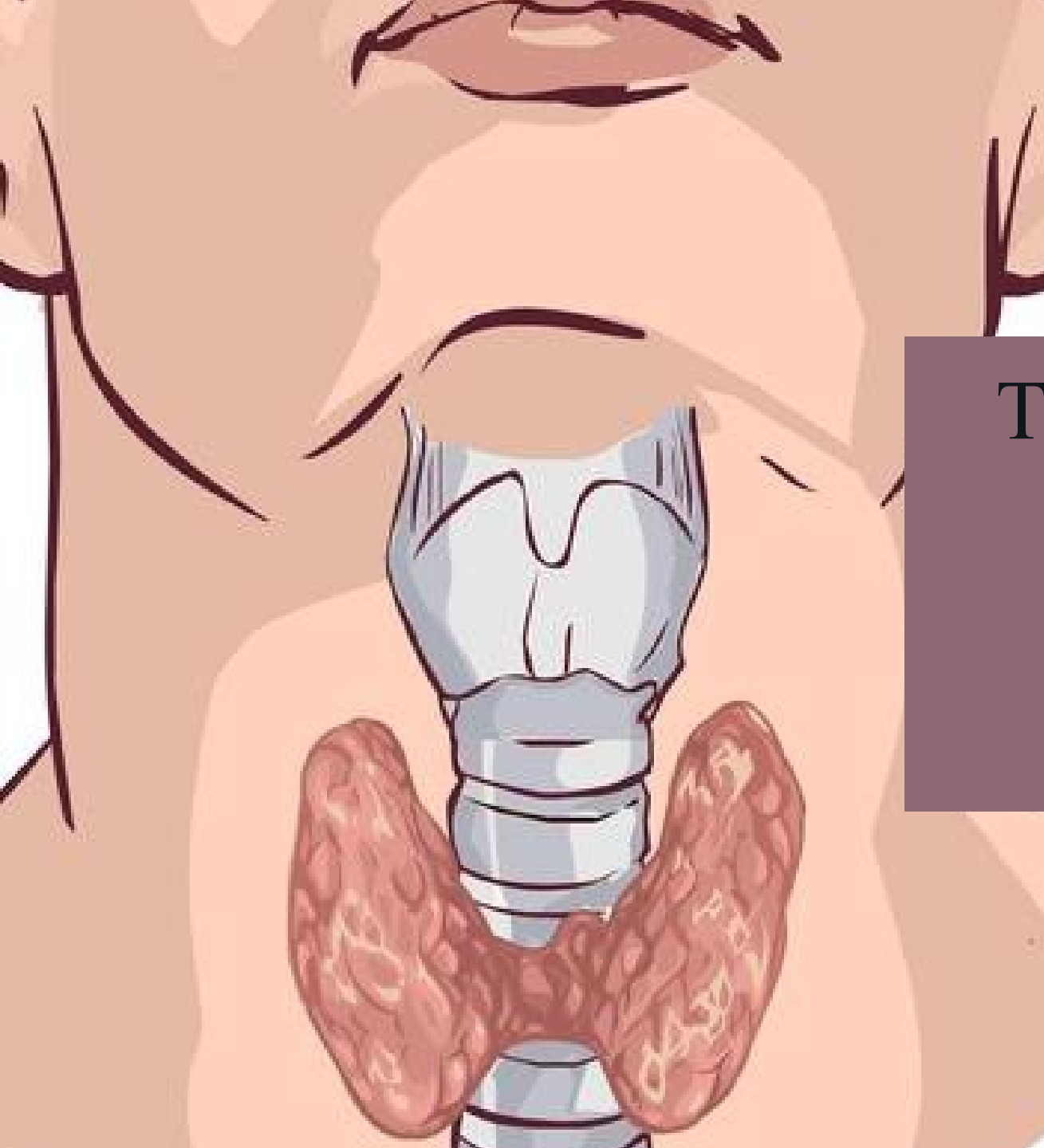




THYROID DISORDERS



THYROID PROBLEMS

Hypothyroidism

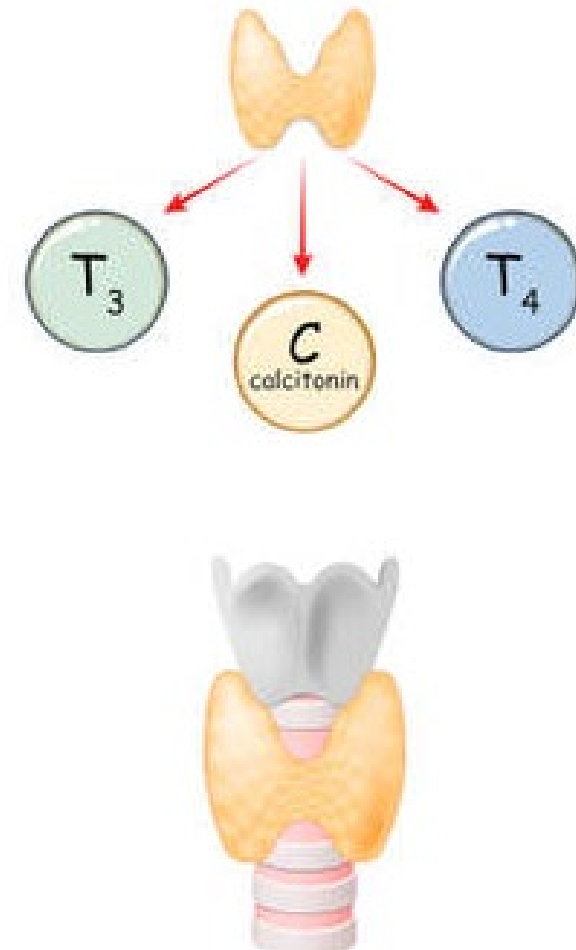
Hyperthyroidism

Thyroid nodules

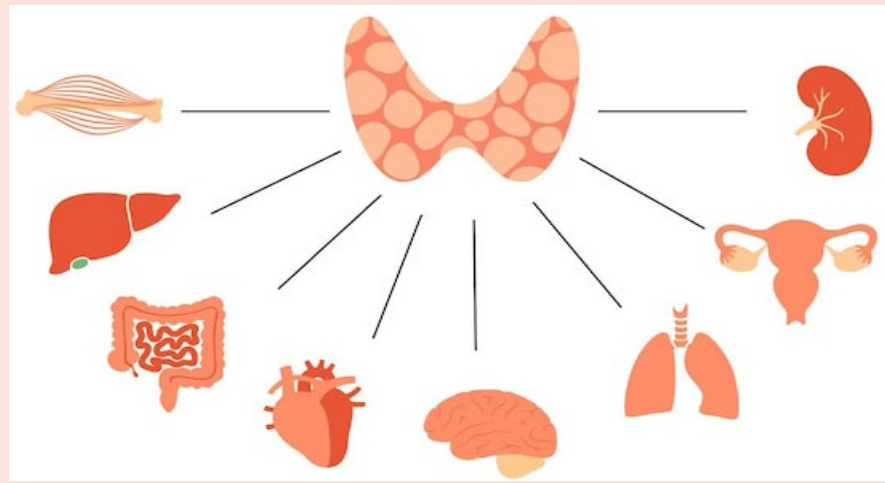
What is the thyroid?

The thyroid is a butterfly shaped gland that sits at the base of the neck.

- It produces 2 main hormones: **T4** and **T3**.
 - These 2 hormones are responsible for regulating metabolism.
- It also produces calcitonin which is a hormone that helps control the level of calcium in the body.

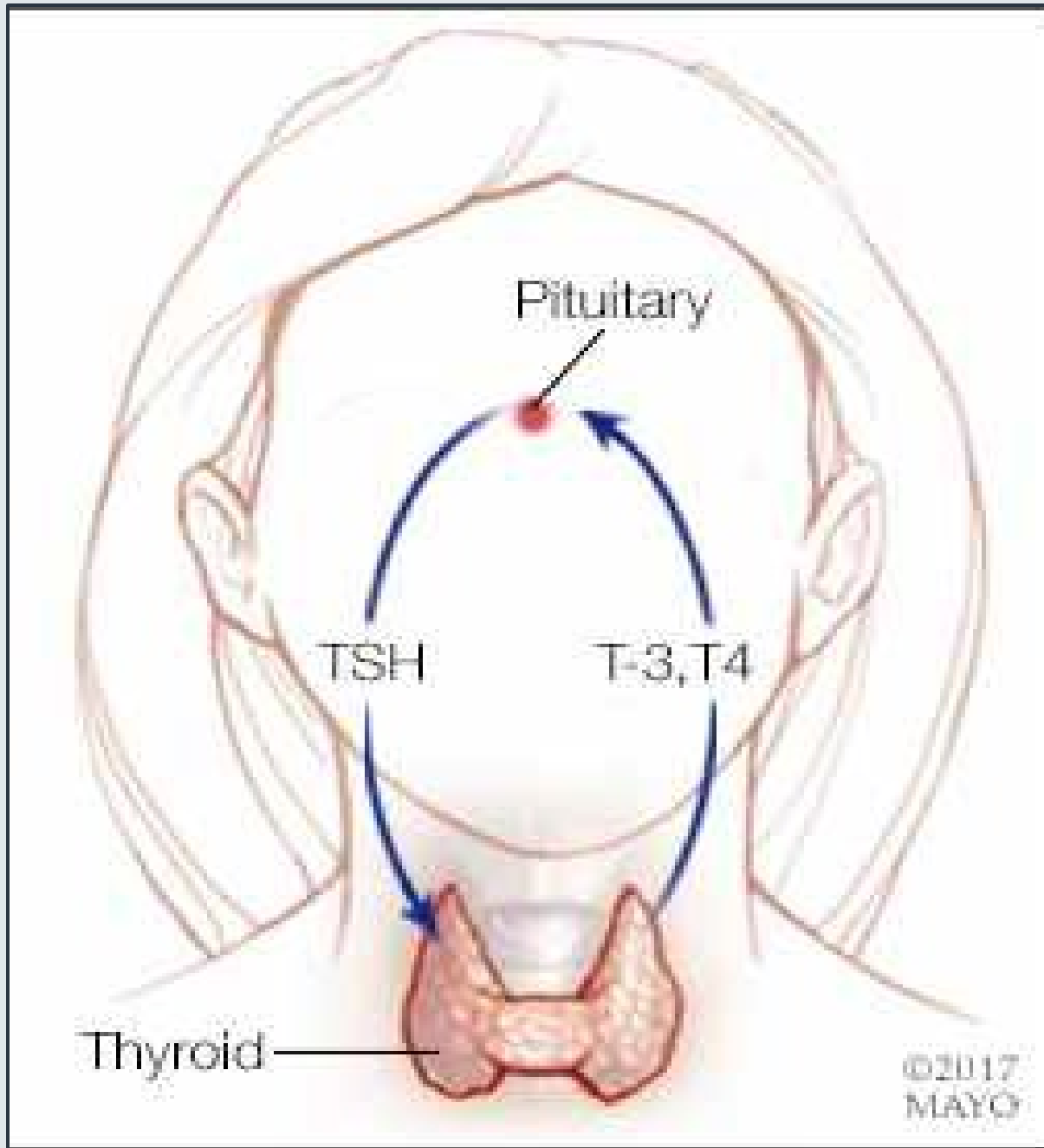


Thyroid hormones



The thyroid hormones stimulate almost every cell in the body to increase its metabolism. The hormones work in the following areas:

- Cardiac: increases heart rate and blood flow
- Metabolic: improves heat production, oxygen usage, blood sugar usage
- Respiratory: Increases breathing rate and oxygen delivery to tissues
- Nerves: Increases energy, alertness, responsiveness and reflexes
- Gut: Improves stomach tone and motility
- Bones: Increases bone and connective tissue mobility
- Reproductive: regulates reproductive hormones in men and women (ovulation and sperm formation)
- Kidney: promotes renal flow and increases renal clearance.



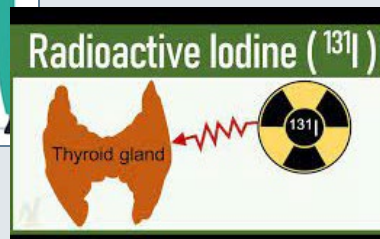
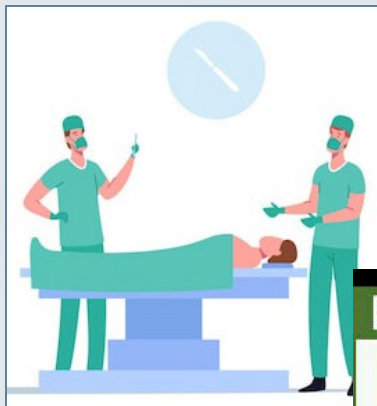
What about TSH?

TSH (thyroid stimulating hormone) is produced in the pituitary gland.

When levels of T3 are low in the blood, the pituitary gland is stimulated to make both T3 and T4.

- When levels of T3 and T4 are low, TSH level is high.
- When T3 and T4 are high, TSH level is low.

Causes of hypothyroidism



Primary

Problems with the gland itself:

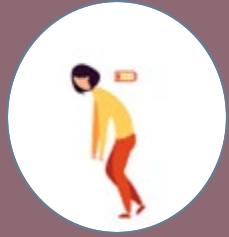
- Hashimoto's thyroiditis
- Nodules in the gland

Secondary:

Problems in the pituitary gland such as tumor, trauma, etc.

Other:

- Medications
- Surgery on the gland
- Radioactive iodine treatment for overactive thyroid
- Hemochromatosis, scleroderma
- Iodine deficiency or excess.



HYPOTHYROID SYMPTOMS



General
symptoms
include:

Fatigue, sluggishness
Weight gain
Cold intolerance

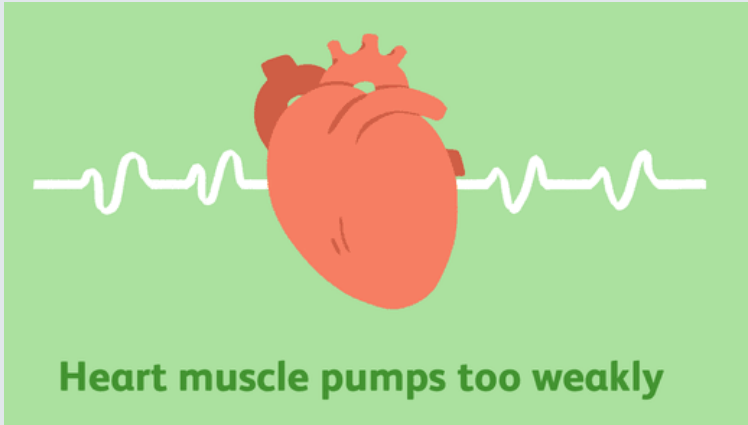


Skin changes

- Decreased sweating
- Dry, thick skin
- Coarse, thin hair; eyebrows may disappear
- Brittle nails

Eye changes –
May see swelling
around eyes



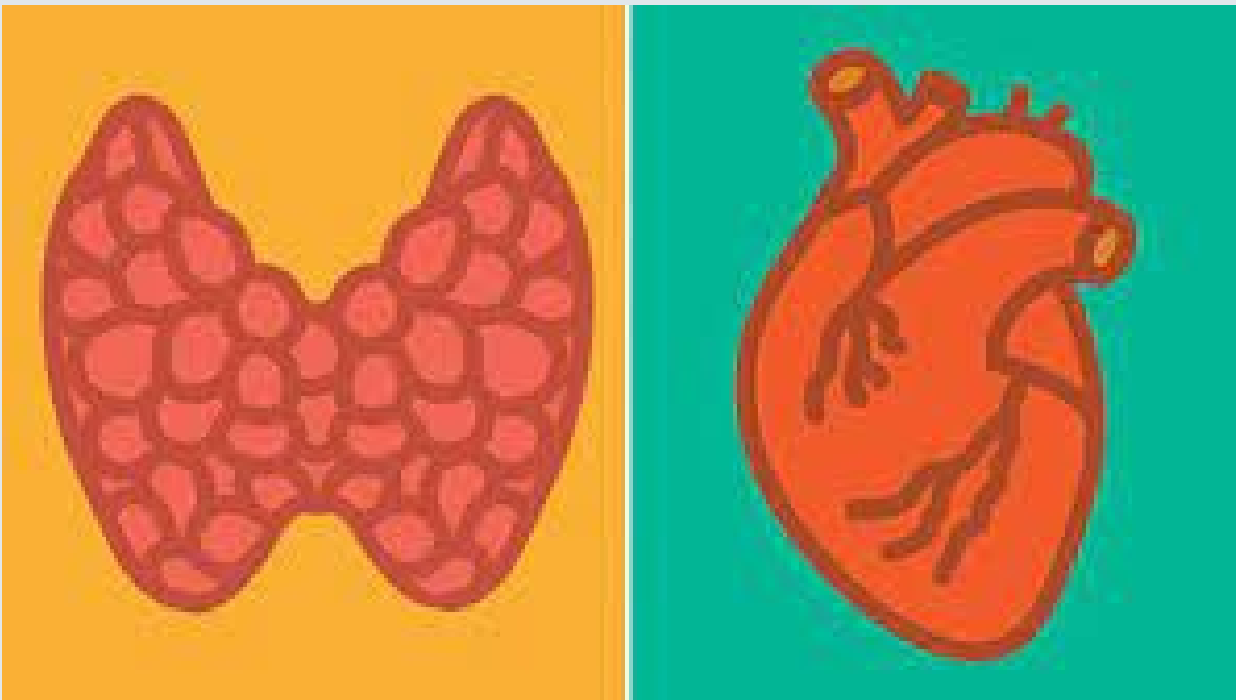


Hypothyroidism and the heart

Slow heart rate and decreased function of the heart:

- Causes fatigue, shortness of breath with exercise
- Causes swelling in the ankles
- Can cause high blood pressure

Cholesterol levels may be elevated



Respiratory system

1. Weaker respiratory muscles and decreased lung function leads to:
 - fatigue
 - shortness of breath
 - decreased ability to exercise
2. Sleep apnea
3. Swelling of the tongue and hoarse voice



Gastrointestinal system:

Constipation from slowing of the digestive tract.



Reproductive system:

Menstrual cycle irregularities cause:

- absent or infrequent periods to very frequent, heavy periods
- difficulty getting pregnant
- a higher chance for miscarriage



TREATMENT



The goal of treatment is to return blood levels of TSH and T4 to the normal range and to control symptoms.

- Thyroid replacement should be taken on an empty stomach as many foods and supplements interfere with absorption.
- Blood levels will be checked periodically to make certain the right dose is being taken.
- Life-long therapy is needed by most people.
- Taking too much thyroid supplement can be dangerous causing atrial fibrillation and bone loss.

- **Grave's disease** – autoimmune disorder
- **Thyroiditis** (temporary inflammation of the thyroid)
 - Postpartum thyroiditis
 - Silent thyroiditis
 - Subacute thyroiditis
- **Toxic multinodular goiter** – multiple nodules in the thyroid produce excessive thyroid hormone
- **Toxic nodule** – a single nodule in the gland can produce excessive hormone
- **Excessive iodine ingestion** from various sources
- **Overmedication** with thyroid hormone

Causes of hyperthyroidism



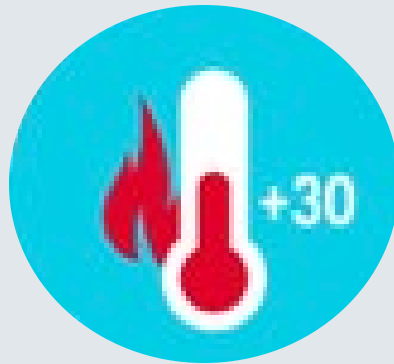
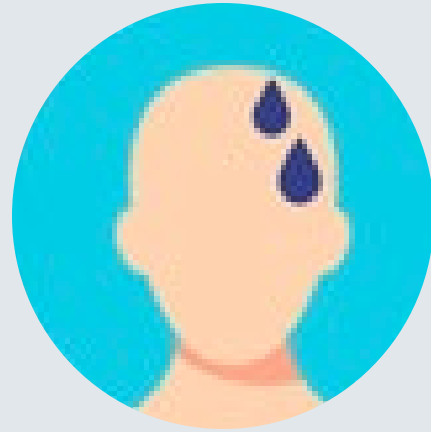


HYPERTHYROID SYMPTOMS



Anxiety, irritability
Nervousness
Difficulty sleeping

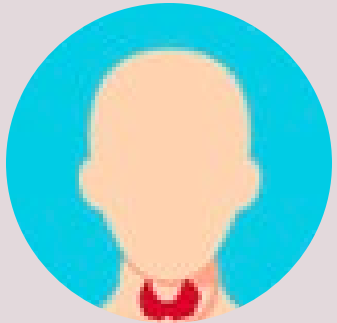
Muscle weakness
Tremors



More symptoms

- Rapid, forceful heartbeats
- Sweating; warm, moist palms
- Heat intolerance

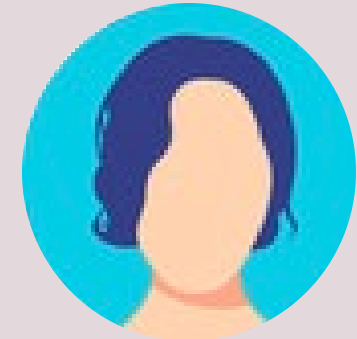
Other symptoms



**Enlarged
thyroid**



Weight loss

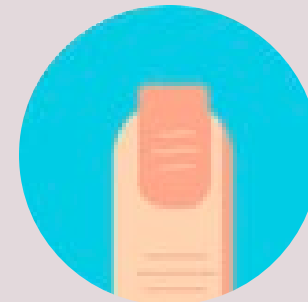


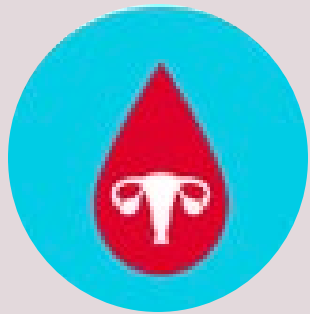
Hair loss

Bulging eyes



Soft nails





And more symptoms

- Frequent bowel movements
- Irregular, often scant, menstrual periods
- Infertility

Medications:

- Antithyroid drugs decrease the amount of thyroid hormone made by the body.
- Beta blockers are given to help control some of the symptoms.

Radioactive Iodine:

- Radioactive iodine destroys the thyroid by “ablation”. It is given orally and takes 6 to 18 weeks to work.

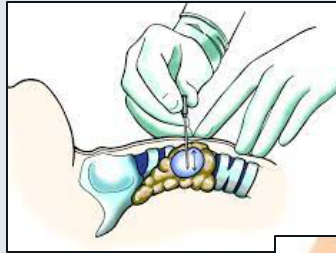
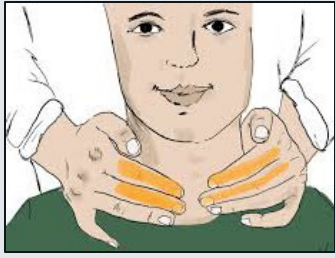
Surgery:

- Surgical removal carries the risks of damage to nerves of the voice box and possible damage to parathyroid glands which regulate the body’s calcium balance.
- Surgery is often used if there is a nodule in the gland that could be a cancer.

Hyperthyroidism treatment



DIAGNOSIS



Hypothyroidism and Hyperthyroidism

Diagnostic testing may include:

- Physical examination of the neck
- Blood tests
- Thyroid ultrasound
- Needle biopsy
- MRI or CT scans
- Radioactive iodine tests



THYROID NODULES

Thyroid nodules are round or oval-shaped spots within the thyroid gland.

They can be caused by several conditions; most are not serious.

They are very common; up to half of all people have at least one thyroid nodule.



Symptoms from thyroid nodules

Often asymptomatic and found on physical exam.

Other symptoms include:

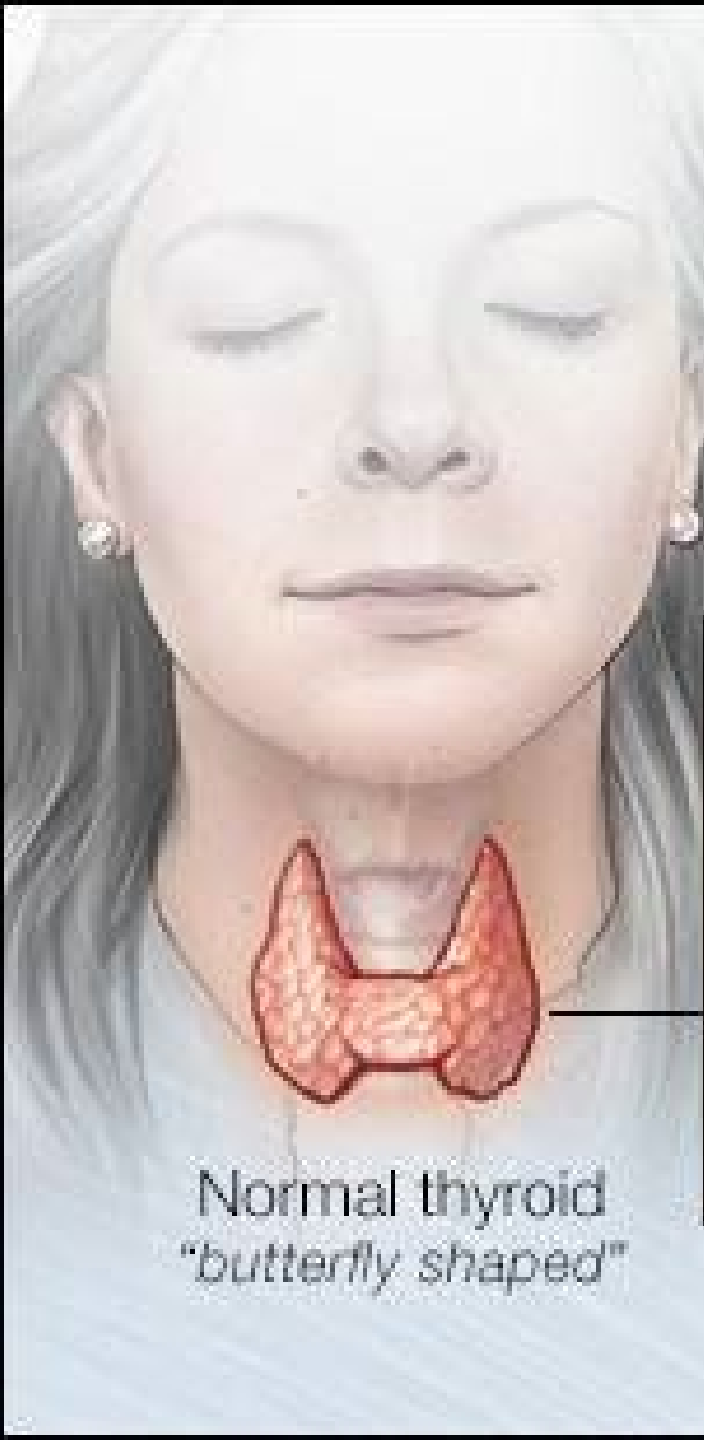
- Feeling or seeing a lump on the neck
- Feeling worried, upset, or having trouble sleeping
- Feeling weak or tired
- Losing weight
- Having a fast heartbeat

THYROID NODULES

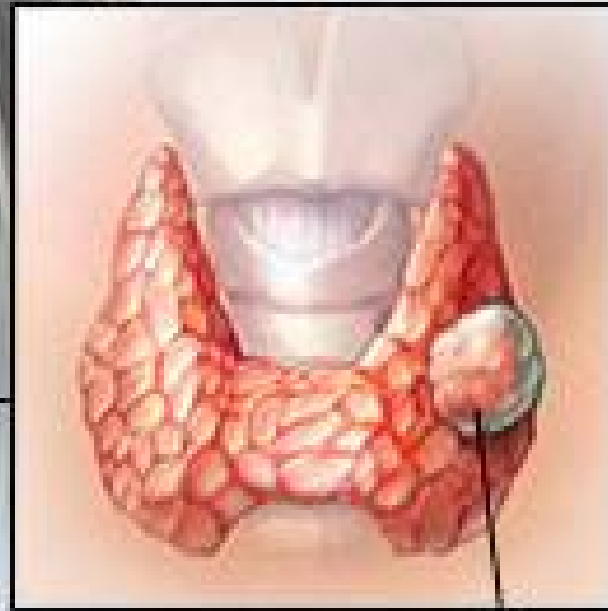
"Lumps in the thyroid"

90% to 95%
are benign
(noncancerous)

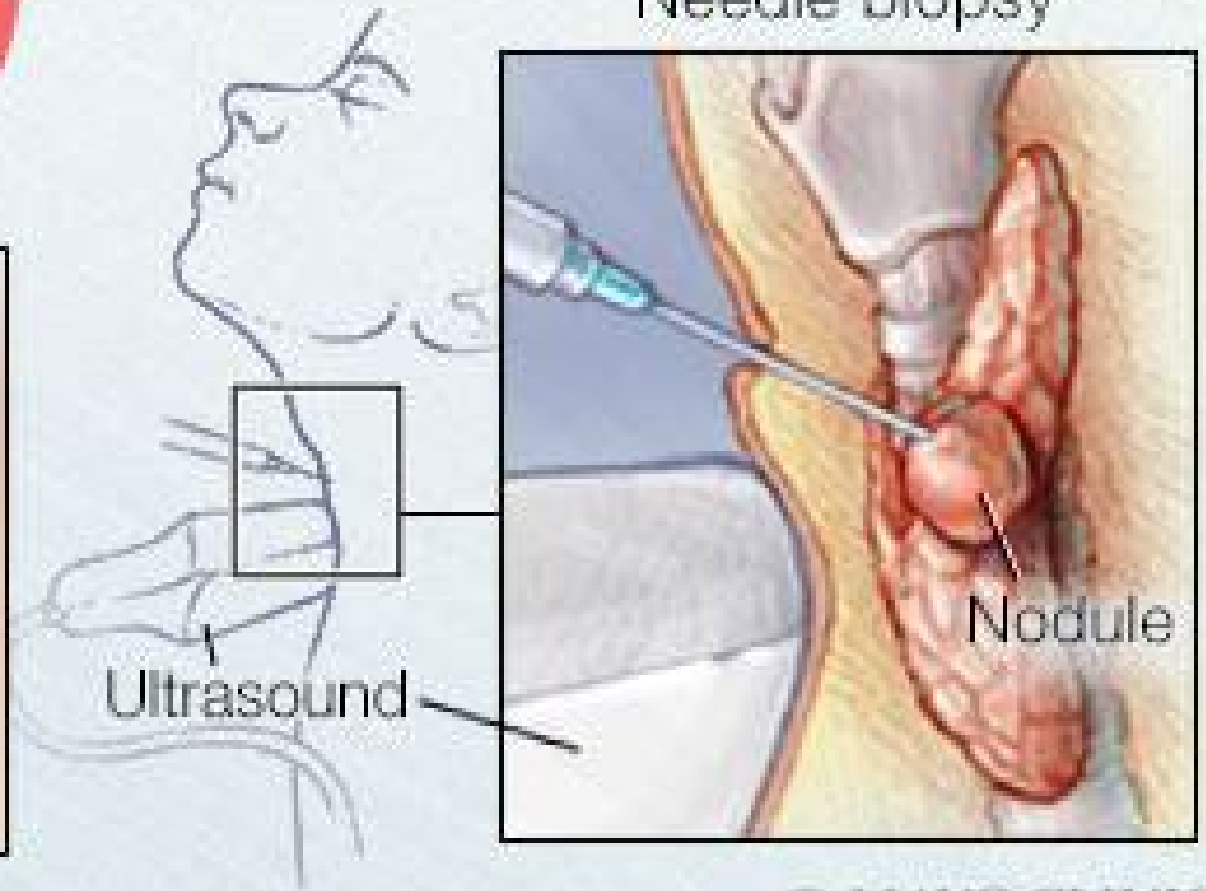
3% to 5%
are cancerous



Normal thyroid
"butterfly shaped"



Nodule





Toxic multinodular goiter

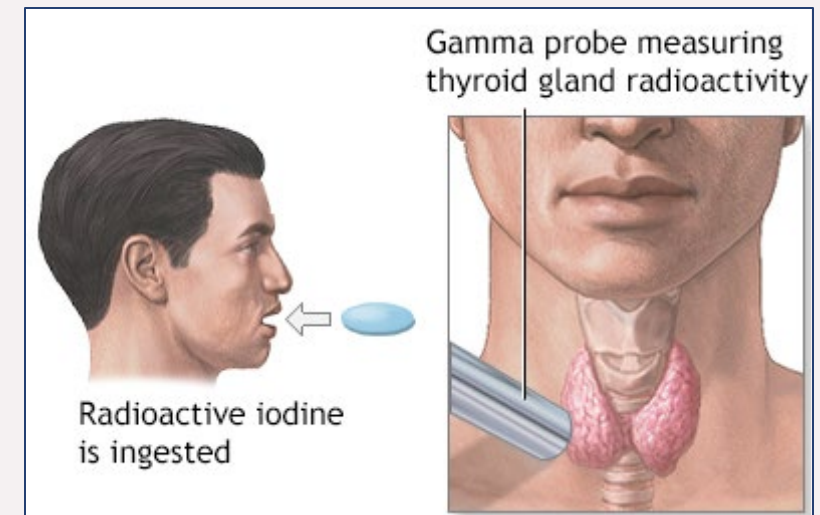
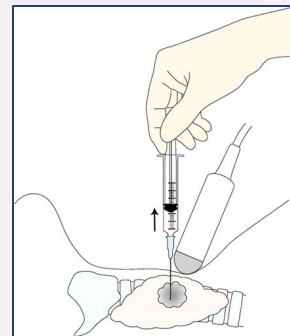
Multiple nodules in the thyroid can produce excessive thyroid hormone, causing hyperthyroidism.

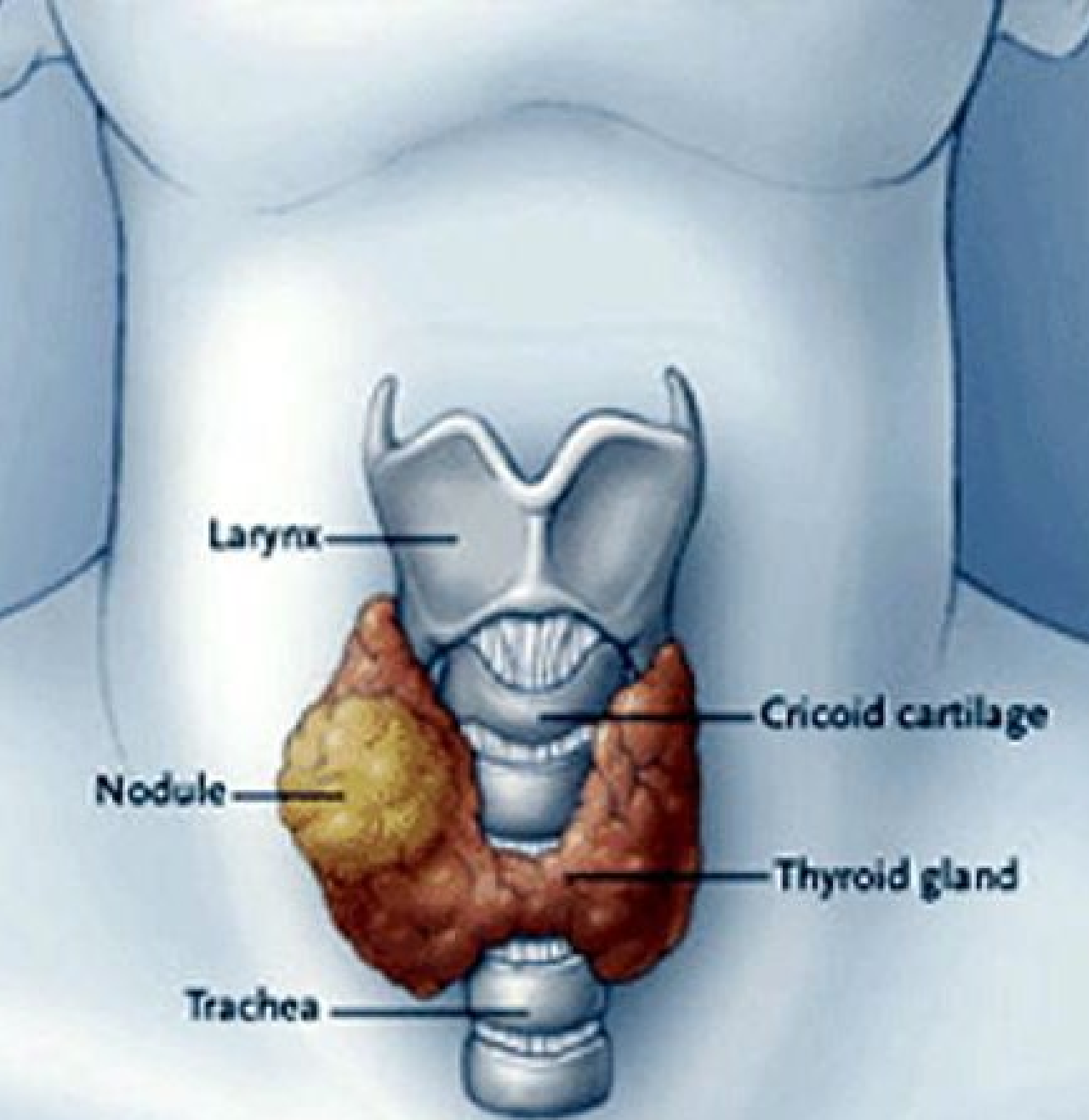
Prevalence increases with age.

Evaluation of nodules

When nodules are discovered, testing may include:

- Blood tests
- Thyroid ultrasound
- Needle biopsy
- Radioactive iodine tests





Treatment of nodules

- Antithyroid medications
- Medications to help control symptoms
- Surgery
- Radioiodine
- Injections of alcohol to shrink them
- Laser treatment to destroy them

