THYROID DISORDERS

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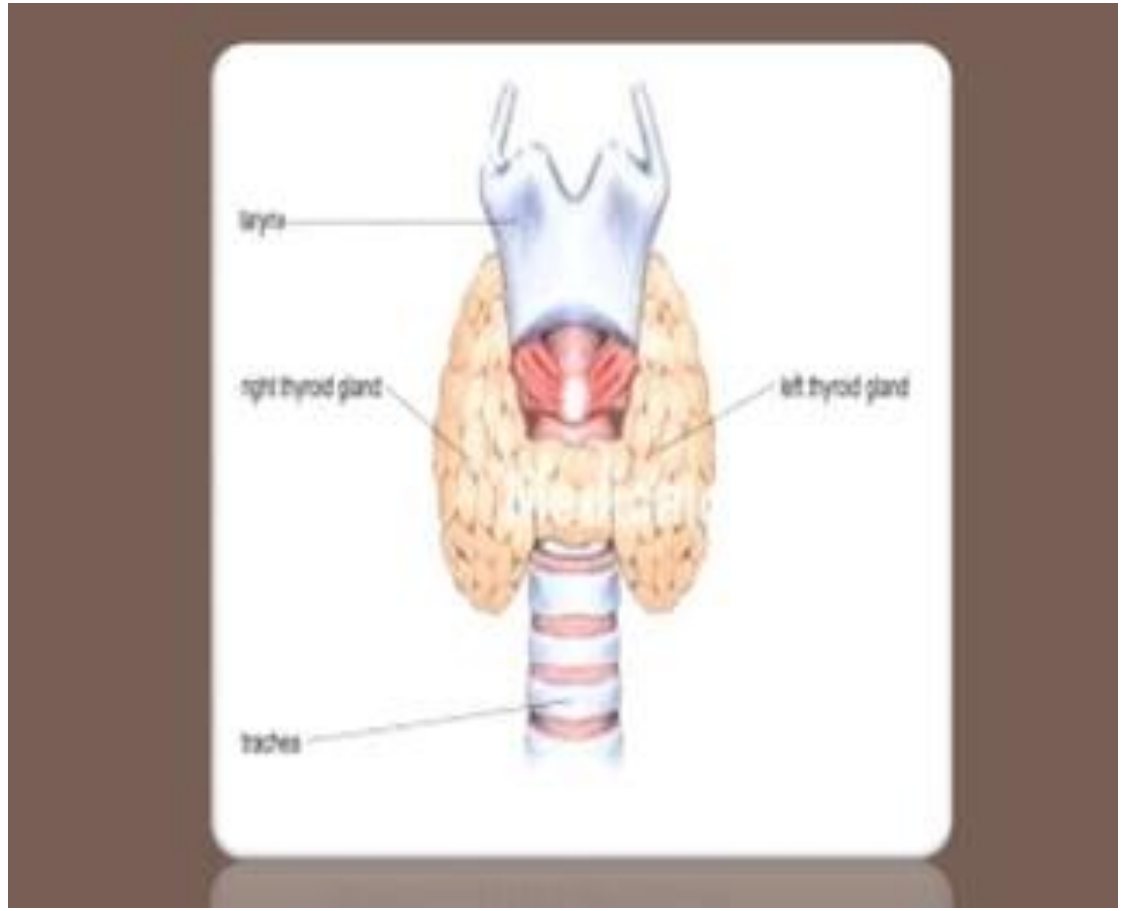
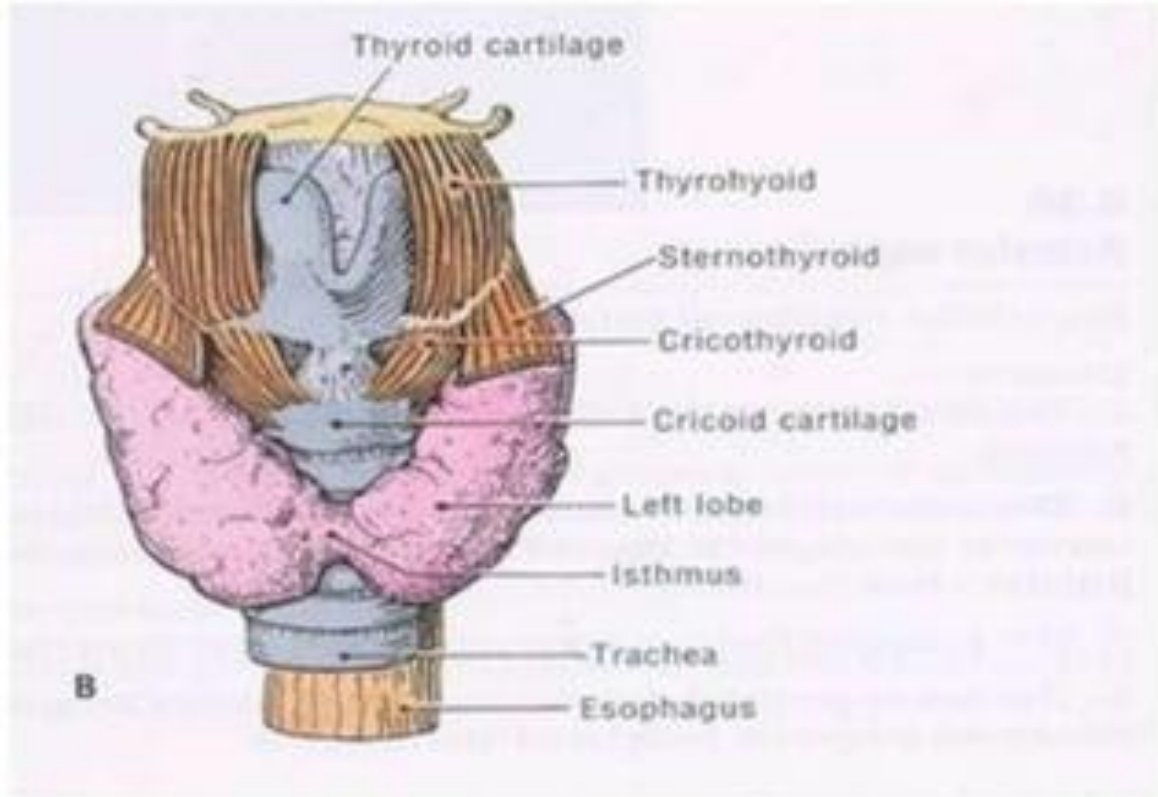
INTRODUCTION

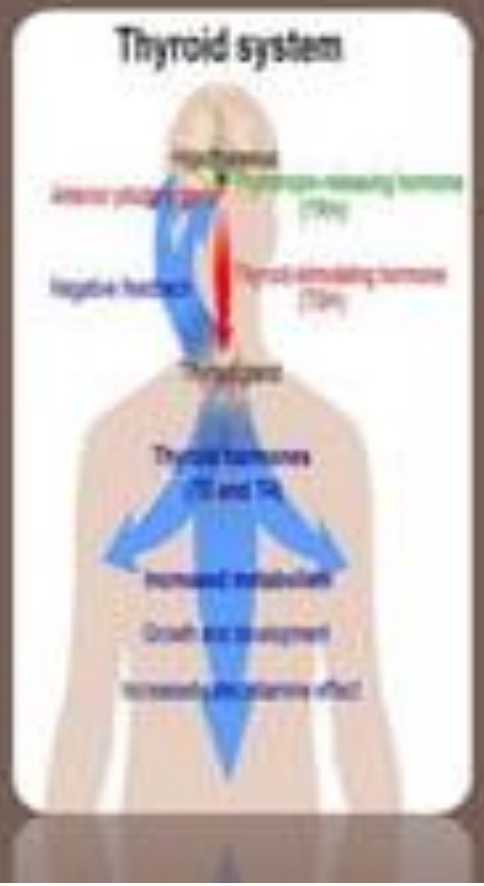
- Largest endocrine gland.
- Located inferior to cricoid cartilage.
- Butterfly shaped organ comprising of two lobes
  - lobus dexter(right)
  - lobus sinister(left)
- Weighs 18-60gms in adults.
- Histologically it is made up of follicular and parafollicular cells.

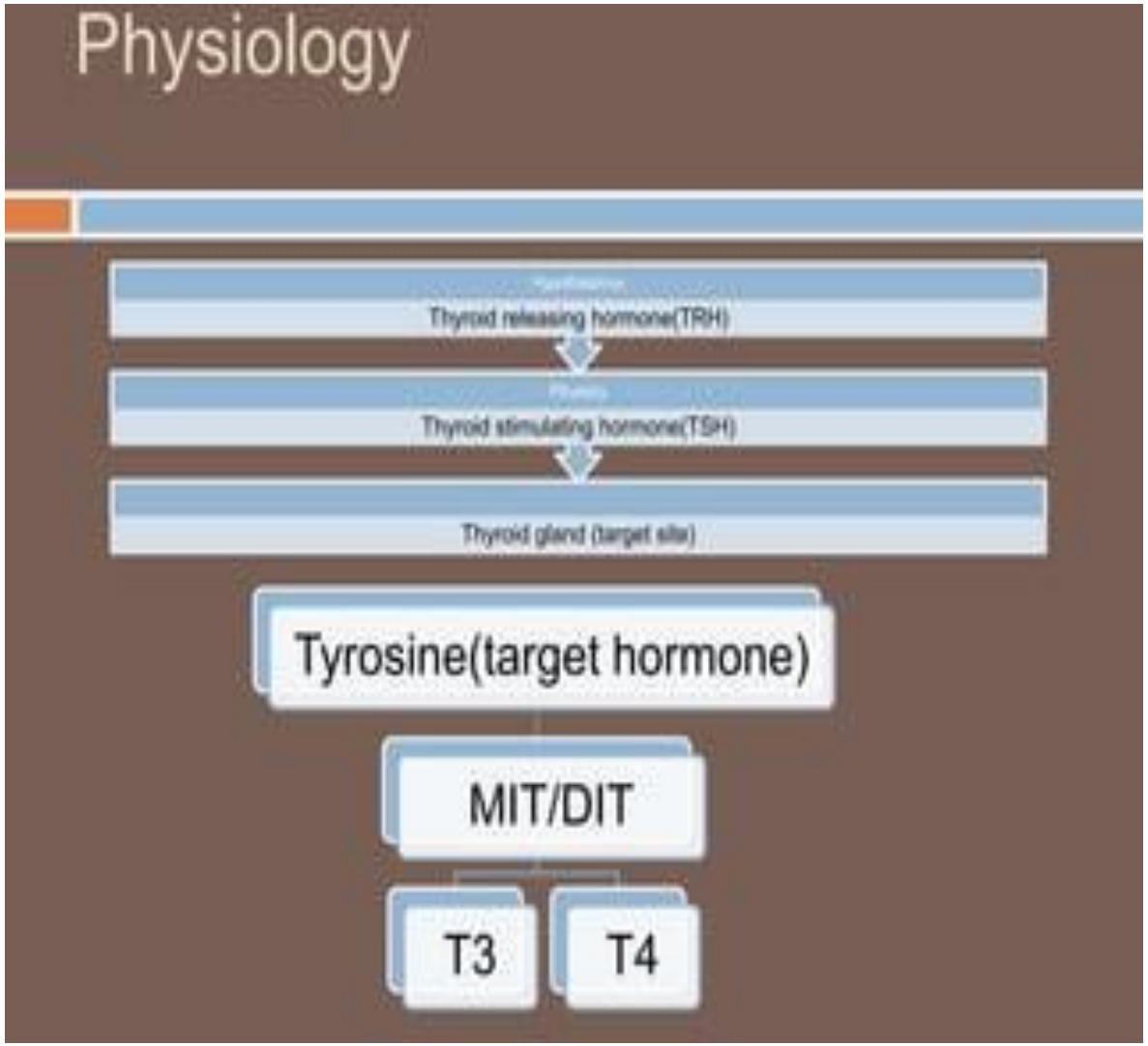
- Blood supply
  Arterial supply - superior thyroid artery
  - inferior thyroid artery
  Venous supply - superior thyroid vein
  - inferior thyroid vein
- Nerve supply
  - Superior laryngeal nerve
  - Recurrent laryngeal nerve
- Lymphatic drainage
  - Lateral deep cervical lymph node
  - Pretracheal/para tracheal lymph nodes

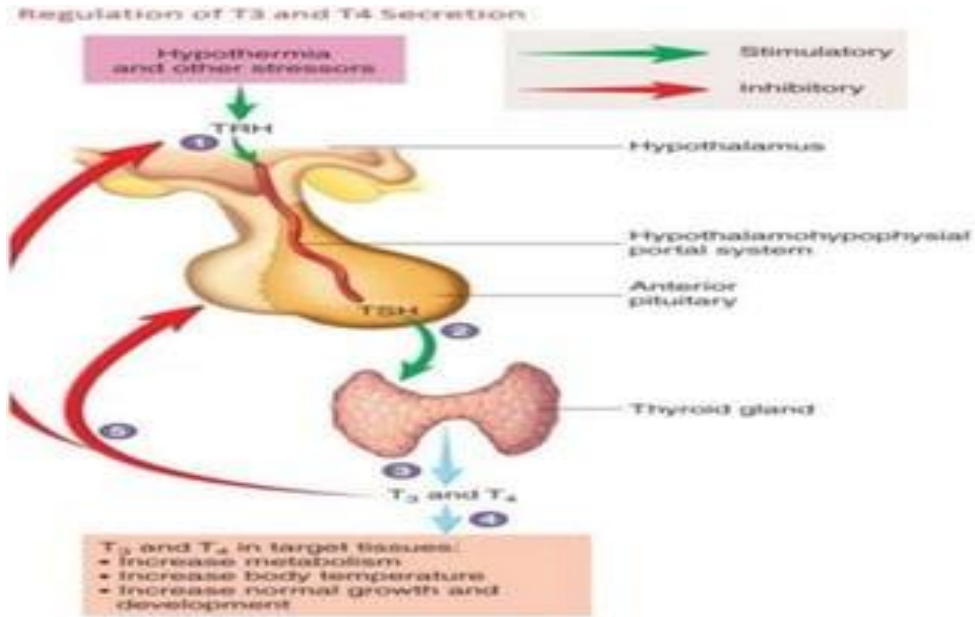

larynx
right thyroid gland
left thyroid gland
trachea


Thyroid cartilage
Thyrohyoid
Sternothyroid
Cricothyroid
Cricoid cartilage
Left lobe
Isthmus
Trachea
Esophagus
B

- Functions
  - Produces thyroid hormones.
  - Produces calcitonin.

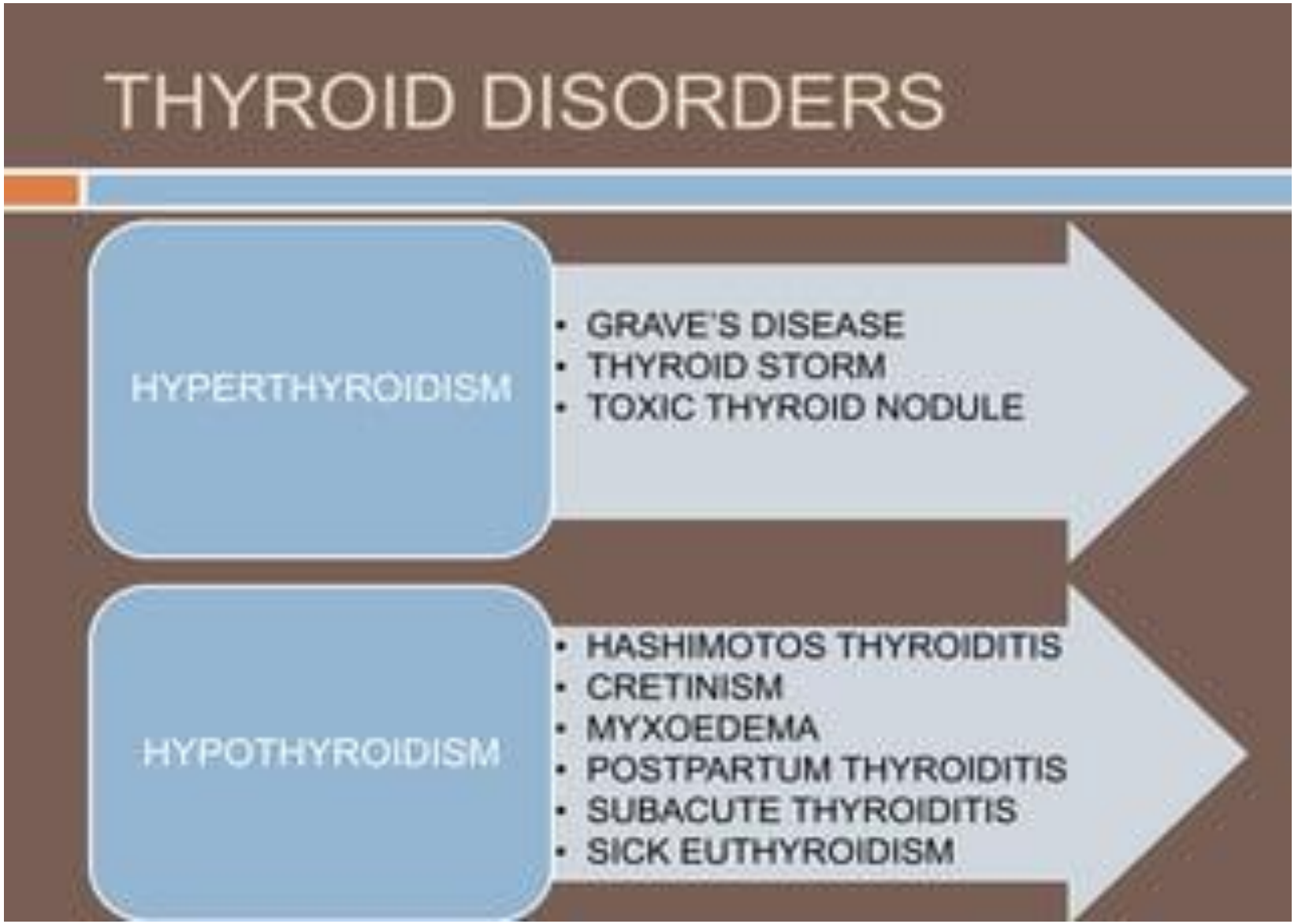



Physiology
Thyroid releasing hormone(TRH)
Thyroid stimulating hormone(TSH)
Thyroid gland (target site)
Tyrosine(target hormone)
MIT/DIT
T3
T4


Regulation of T3 and T4 Secretion
Hypothermia and other stressors
Stimulatory
Inhibitory
TRH
Hypothalamus
Hypothalamohypophysial portal system
Anterior pituitary
TSH
Thyroid gland
T3 and T4
T3 and T4 in target tissues:
• Increase metabolism
• Increase body temperature
• Increase normal growth and development

NEGATIVE FEEDBACK

Thyroid hormones on pituitary

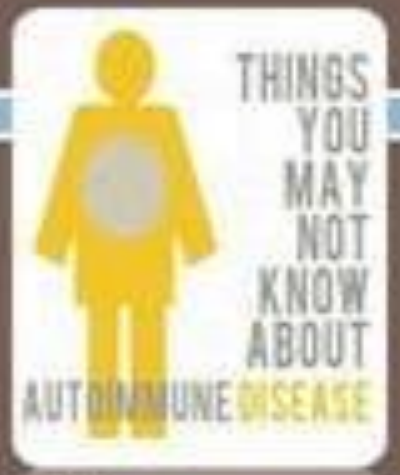

THYROID DISORDERS
HYPERTHYROIDISM
• GRAVE'S DISEASE
• THYROID STORM
• TOXIC THYROID NODULE
HYPOTHYROIDISM
• HASHIMOTOS THYROIDITIS
• CRETINISM
• MYXOEDEMA
• POSTPARTUM THYROIDITIS
• SUBACUTE THYROIDITIS
• SICK EUTHYROIDISM

THYROTOXICOSIS

- Hypermetabolic clinical syndrome resulting from serum elevation of thyroid hormone levels(T3 & T4).
- Causes are GRAVE' S disease, multinodular goitre and toxic adenoma.
- GRAVE'S DISEASE is the most common form.

GRAVE'S DISEASE

Introduction



- Autoimmune disease.
- Female : Male ratio – 5:1 or 10:1
- Has a strong hereditary component.
- Diagnosis is mainly made by the symptoms

Signs and symptoms

- Skin is warm and moist, palms are warm,moist and hyperemic and Plummer's nails are seen.
- Pretibial myxedema.
- Alopecia and vitiligo.
- Severe cases proptosis maybe seen
- Excessive sweating and heat intolerance.
- CVS symptoms: palpitations, CCF, isolated systolic hypertension.
- Metabolic symptoms: weight loss despite of increased in apetite.

- GIT symptoms: hyperdefecation.
- Exacerbate bronchial asthma.
- CNS symptoms: nervousness, irritability, tremor, insomnia, proximal muscle weakness.
- In females: amenorrhea/ oligomenorrhea.
- In males: impotence and loss of libido.

Eye signs

- VON GRAEFE'S SIGN – Lid lag.
- JOFFROY'S SIGN – Absence of wrinkling of forehead on looking up.
- STELLWAG'S SIGN – Decreased frequency of blinking.
- DALRIMPLE'S SIGN – Lid retraction exposing the upper sclera.
- MOBIUS SIGN – Absence of convergence.

Investigations

- T3 & T4 levels.
- Thyroid uptake of radio iodine.
- Presence of antibodies: TSH receptor antibody
  Antimicrosomal antibody
- CT orbits thyroid scans.

Management

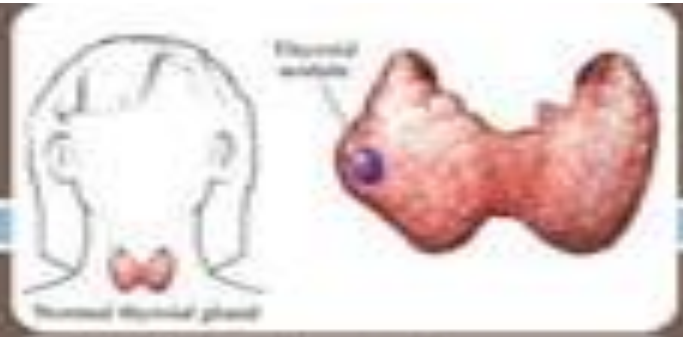
- Immediate control: Propranolol 40mg/6hr orally.
- Long term control:
  - Anti thyroid drugs – Carbimazole 15mg tid initially and then reducing it to 5mg tid for 12-18 months.
  - Radio iodine ablation – Postmenopausal women and elderly men.
    In recurrence following surgery.
    Given to fertile women conception postponed to 1 year.
  - Surgery – Presence of large goitre.
    Poor drug compliance.

- Exopthalmos: Corticosteroids.
  Tarsorrhaphy.
  Orbital decompression.
- Cardiac arrythmias: ß- blockers.
  In euthyroid state,
  cardioversion is done.

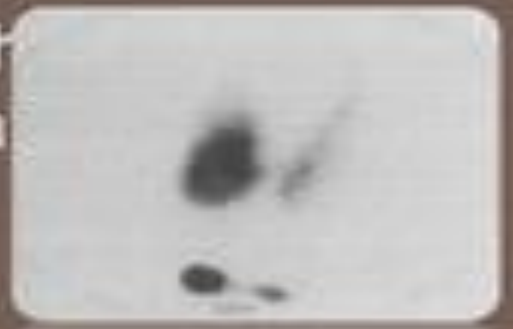
MULTINODULAR GOITRE

- Excess production of thyroid hormones from functionally autonomous thyroid nodules which do not require the stimulation from TSH.
- Second common cause.
- Occurs in individual over 60 years of age and females are mostly affected.

Symptoms



- Large goitre with or without tracheal compression.
- Goitre is nodular or lobulated, often palpable.
- Large goitre cause mediastinal compression with stridor, dysph
  obstruction of superior vena ca
- Hoarseness



Management

- Small goitre : No treatment.
  Annual review.
- Large goitres : Partial thyroidectomy.
  Radioactive iodine ^{131}I
- Recurrence is common after 10-20 years.

THYROID STORM

- Rare but life threatening sudden severe exarcerbation of hyperthyroidism.
- Causes: Precipitated by stress or infection with either unrecognized thyrotoxicosis or inadequately treated thyrotoxicosis.
  Following subtotal thyroidectomy/radio active iodine.
  Trauma.
  Pregnancy.
  Emotional stress.

Signs

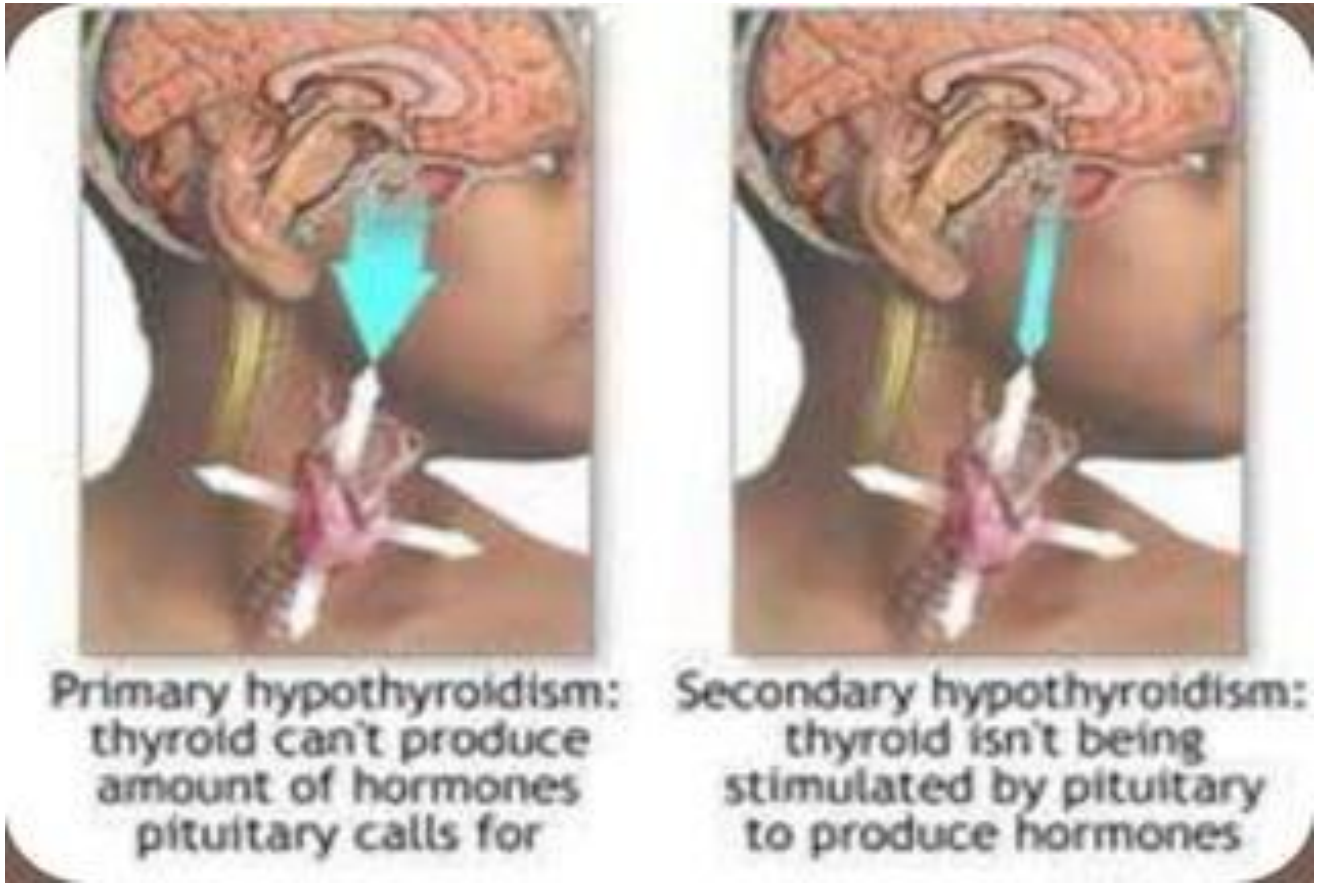
- Elevation of temperature.
- Increase in heart rate.
- Irritable.
- Delirius/comatose.
- Hypotension.
- Vomiting.
- Diarrhoea.

Management

- Treatment started immediately with
  - Propranolol 80mg/6hrs orally(dose of 1-5mg/6hrs given IV).
  - Potassium iodide 60mg daily orally/ sodium iopodate 500mg daily orally.
  - Carbimazole 60-120mg daily
  - Dexamethasone 2mg/6hrs IV.
  - Fluid replacement.
  - Antibiotics.

HYPOTHYROIDISM

- Insufficiency synthesis of thyroid hormones.
- Female : Male ratio is 6 : 1.
- Causes : Hashimoto's thyroiditis
  Thyroid failure following radio iodine.
  surgical treatment of thyrotoxicosis.
  Drugs like carbimazole, amiadarone.
  Iodine deficiency.


Primary hypothyroidism: thyroid can't produce amount of hormones pituitary calls for
Secondary hypothyroidism: thyroid isn't being stimulated by pituitary to produce hormones


Symptoms of Hypothyroidism
Depression
Forgetfulness
Loss of Eyebrow Hair
Dry Coarse Hair
Puffy Face
Enlarged Thyroid (Goiter)
Slow Heartbeat
Dry Skin
Weight Gain
Arthritis
Constipation
Brittle Nails
Heavy Menstural Periods
Infertility

HASHIMOTO'S THYROIDITIS

- Primary condition of hypothyroidism
- Autoimmune.
- Described by Hakaru Hashimoto

Signs and symptoms

- Weight gain.
- Enlarged thyroid gland.
- Depression.
- Sensitivity to heat/cold.
- Fatigue.
- Hypoglycemia.
- Increased cholestrol level.

Diagnosis

- T3 & T4 levels.
- Presence of TPO antibodies.
- Positive ANF.

Treatment

- Thyroxine therapy.

LEVOTHYROXINE

- Helps in both hypothyroidism and goitre shrinkage

CRETINISM

- Hypothyroidism dating from birth.
- Tyroxine is essential for growth and development of brain during the first three years.
- Earlier onset greater is the brain damage.
- Causes : - Congenital developmental defects.
  - Radio iodine/surgery.
  - Post radiation.
  - Iodine deficiency.
  - Drug induced.
  - Hashimoto's thyroiditis.
  - Recurrent hypothyroidism.

Signs and symptoms

- Dry, cool, mottled skin, hoarse cry, broad flat nose, puffy face.
- Protruberant abdomen, umblical hernia, hypotonia.
- Large posterior fontanelle.
- Lethargy, delayed stooling, poor feeding/sucking.
- Cold to touch.
- Delayed dentition.
- Mental retardation.

Management

- Investigation : Cord blood T4, TSH.
  Serum T4, TSH
  RAIU
  X-ray of knee, foot and skull.
- Treatment
  Medication : levothyroxine (initial dose of 10-15mcg/kg/dl).
  Diet : iodine rich foods.
  Follow up.

MYXOEDEMA

- Severe hypothyroidism in which there is accumulation of hydrophilic mucopolysaccharides in the skin and other tissues.
- Common in women.
- Two variants – Hyperthyroid myxoedema
  – Hypothyroid myxoedema.
- Cause : Increased deposition of glycosamine glycans
  Hashimoto's thyroiditis.

MYXOEDEMA COMA

- Uncommon but life threatening form of untreated hypothyroidism with physiological decompensation.
- Occurs in patients with long standing hypothyroidism.
- Precipitated by a climate induced hypothermia, infection, drug therapy and other systemic conditions

Symptoms

- Lethargy
- Stupor,
- Delirium.
- Hypotension.
- Convulsions.
- Hypoglycemia.
- Hyponatremia.
- Hypoventillation.
- Coma.

Investigations

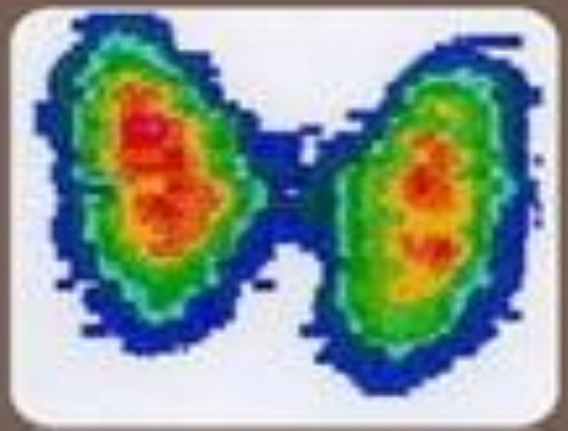
- Free T4 and TSH
- T3 & T4 levels are decreased and TSH are elevated or normal.
- Serum electrolyte and serum osmolality.
- Serum creatinine.
- Serum glucose.
- Differential blood count.
- Pan culture for sepsis.

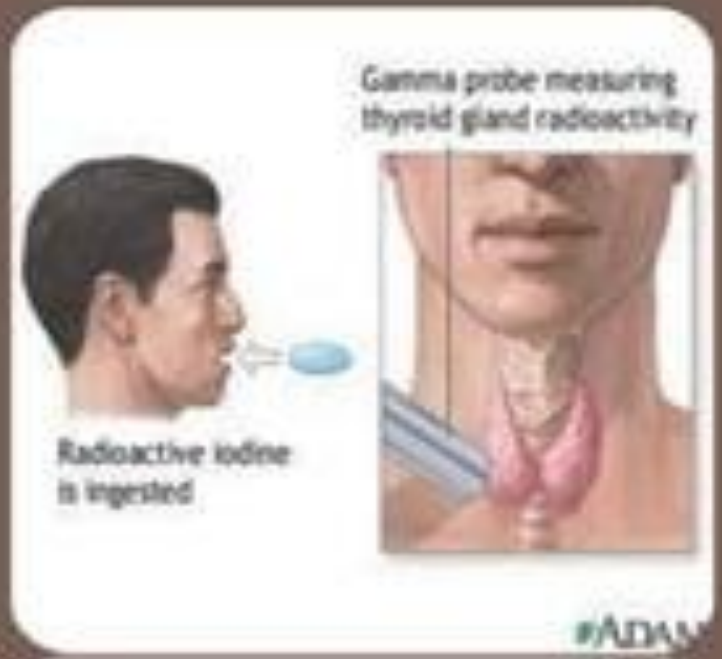
Treatment

- Hyperventilation if respiratory acidosis is significant.
- Immediate IV levothyroxine given
- Loading dose of 500 - 800mcg followed by 50 – 100mcg daily.
- Hydrocortisone 5 – 10mg/hr.
- Treatment of associated infection.
- Correction of hyponatremia with saline.
- Correction of hypoglycemia with IV dextrose.

Thyroid tests

- T3, T4 and TSH levels.
- Presence of TPO antibodi
- Thyroid scan.
- Thyroid uptake test.




Gamma probe measuring
thyroid gland radioactivity
Radioactive iodine
is ingested

Thyroidectomy

- Surgical removal of all or a part of the gland.

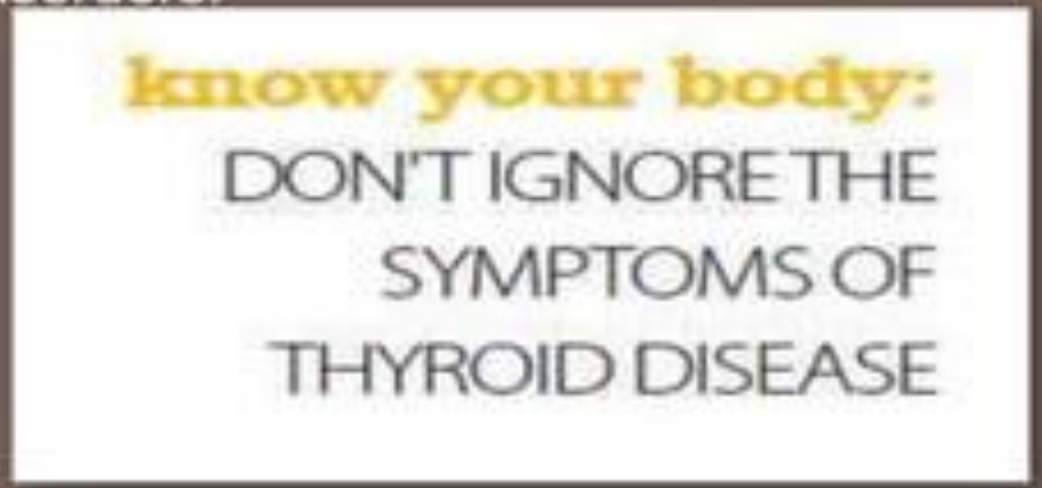
- Indications: Thyroid carcinoma.
  Hyperthyroidism.
  Very enlarged thyroid.
  Symptomatic obstruction.

Complications

- Hypothyroidism.
- Laryngeal nerve injury.
- Hypoparathyroidism
- Infection.
- Chyle leak.
- Surgical scar.

Conclusion

A self assessment of thyroid gland is necessary for earliar detection of thyroid disorders.




THANKYOU