

GOITRE

Contributors:

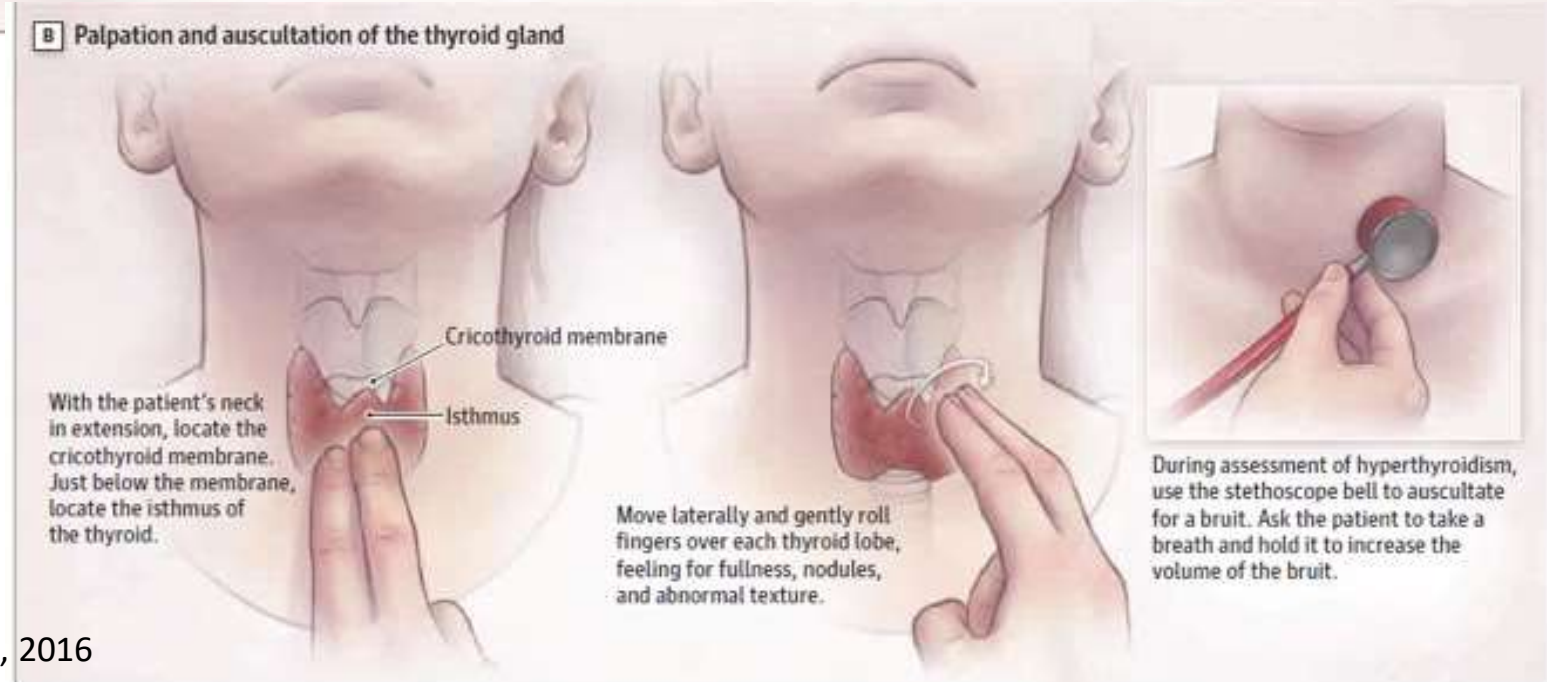
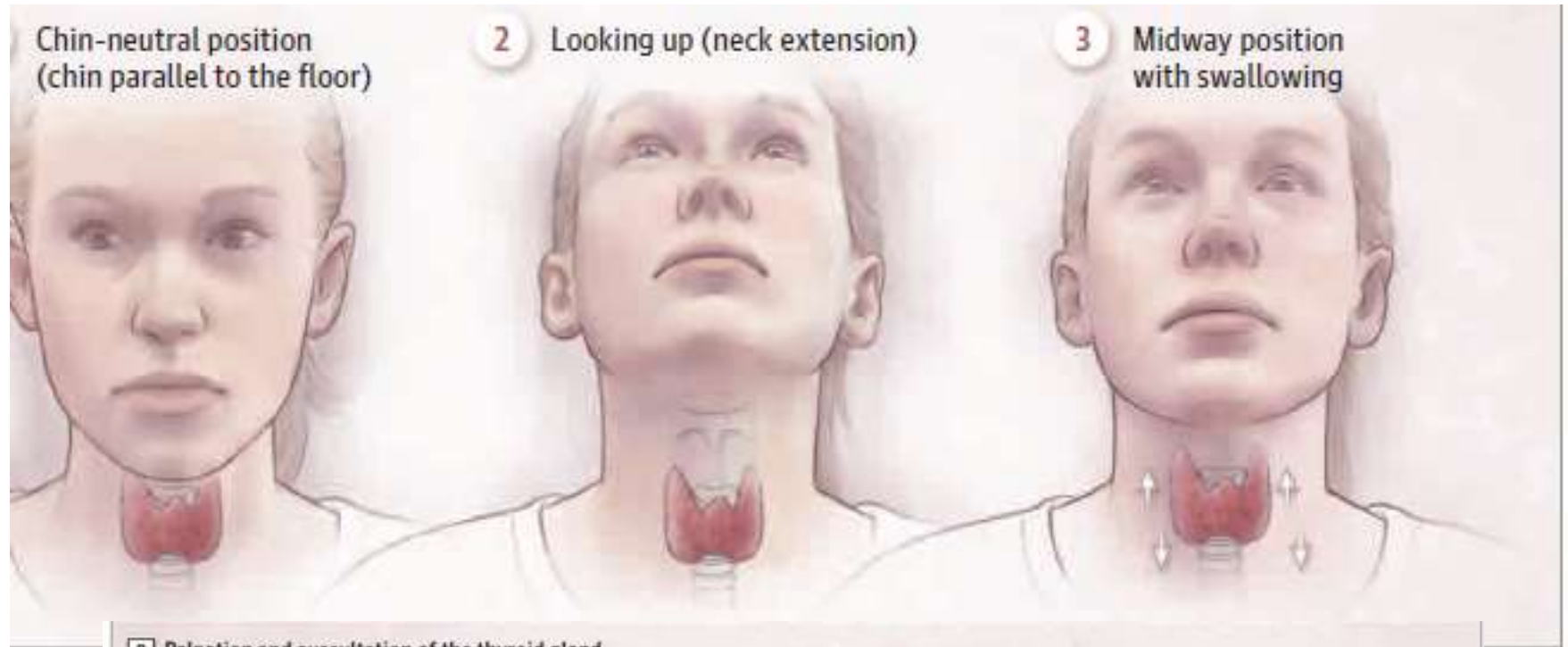
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Introduction

- **Diffuse enlargement of the thyroid gland**
- **More than the size of the child's (patient's) thumb is significant**
- **Goitre may be noted in euthyroid, hypothyroid or hyperthyroid state**

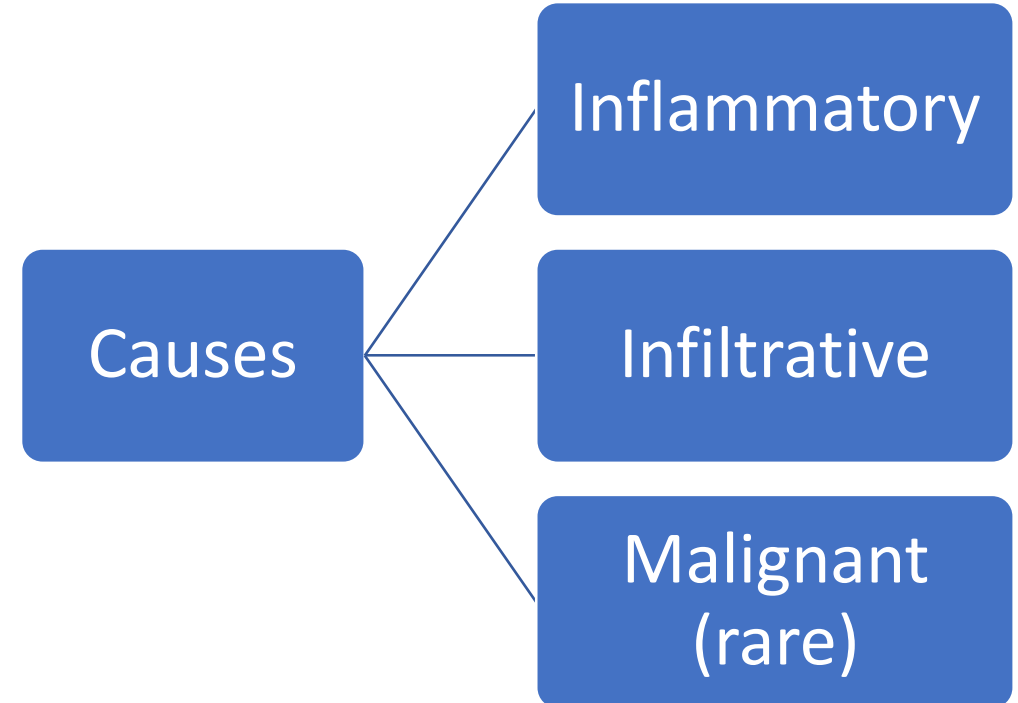


Examination of the Thyroid gland:



Causes

- **Physiological during puberty**
- **Dyshormonogenesis**
- **Autoimmune thyroiditis**
 - a. **Hashimoto thyroiditis**
(Chronic lymphocytic thyroiditis)
 - b. **Graves disease**
- **Colloid goitre (simple)**
- **Iodine deficiency**



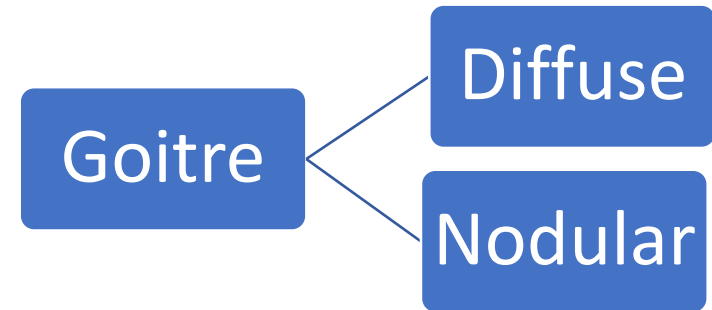
- **Exposure to goitrogenic agents:**
 - Lithium
 - Amiodarone
 - Iodine containing contrast media
 - Anticonvulsants – phenobarbitone, carbamazepine
 - **Infections:**
 - Subacute thyroiditis (Viral)
 - Chronic suppurative thyroiditis
 - **Nodular goitre:**
 - Solitary nodule – adenoma or carcinoma / cyst
 - Multinodular goitre secondary to autoimmune thyroiditis
- Occasionally nodular goitre may be seen in ‘toxic thyroid nodule’.



Goitrogens:

- **FOODS:** Cassava, lima beans, linseed, sorghum, sweet potato, Cruciferous vegetables (cabbage, kale, cauliflower, broccoli, turnips), Soy, millet
- **INDUSTRIAL POLLUTANTS:** Perchlorate, Smoking
- **NUTRIENTS:** Selenium deficiency, Iron deficiency, Vitamin A deficiency

Goitre WHO Classification



Grade	Description
0	No palpable or visible goitre
1	Palpable goitre, not visible when the neck is in normal position
2	Visible swelling in the neck when neck is in normal position
3	Very pronounced swelling, visible from the distance

WHO GRADING OF GOITRE - based on position of neck

On Extension-1 Grade-2 Distance-3



Goitre

- Endemic goitre
- Hashimoto thyroiditis

Goitre and Hypothyroidism

Goitre and hyperthyroidism

- Graves disease
- Hashitoxicosis

- Colloid goitre
- Chronic lymphocytic thyroiditis
- Pubertal goitre

Euthyroid goitre

Nodular goitre

- Iodine deficiency
- Autoimmune thyroiditis

Goitre and hypothyroidism

- Endemic goitre
- Iodine deficiency
- Hashimoto thyroiditis
- Onset: Mid puberty
- F>M
- Family history in 30%
- Risk higher in chromosomal abnormalities and with other autoimmune diseases
- Progression:

Smooth, soft
↓
Granular
↓
Firm, irregular

Goitre and Hyperthyroidism

- Graves disease
- Most common cause of hyperthyroidism
- F>M
- Family history of autoimmune thyroid disease
- Predominant presentation: declining school performance and behavioral manifestations
- Goitre: smooth, rubbery
- Suppressed TSH, T4/T3 ↑
- Hashitoxicosis
- Self-limiting
- Autoimmune damage to follicular cells causes release of preformed T4/T3
- Transient/Permanent hypothyroidism may follow

Euthyroid: Colloid goitre

- Idiopathic simple goitre
- Enlarged thyroid follicles filled with abundant colloid
- F>M; Onset: adolescence
- Spontaneous reduction with time
- Treatment with thyroxine not indicated, only follow up advised
- Goitre appearing during pubertal years are commonly euthyroid

Nodular goitre

- Common in adolescence
 - Usually asymptomatic
 - Multinodular goitre: Hashimoto thyroiditis
 - Solitary nodule: Adenoma, Carcinoma, Cyst
 - Malignancy: Large sized (>4 cm), rapid growth, hard texture
- Nodule: cystic, solid, mixed on ultrasound
 - Cystic: No investigations, managed conservatively
 - Solid/Mixed: Radionuclide scanning
 - ↓
 - Hot (hyperfunctioning)
 - Cold (hypo-functioning)
 - Hot: Benign adenoma
 - Cold: Malignancy, surgical excision

**Central hypothyroidism is not
associated with goitre**

**PRESENCE OF GOITRE INDICATES
DEFECT AT THE
LEVEL OF THYROID GLAND**

Differential diagnosis:

Swelling present in thyroid region: thyroglossal cyst

History

- **History of a midline neck swelling (often missed)**
- **Symptoms of under-functioning thyroid (fatigue, sluggishness, weight gain, and cold intolerance) or over-functioning (anxiety and irritability, restlessness, heat intolerance, goitre, palpitations, difficulty sleeping)**
- **Geographical area of residence for evaluating iodine deficiency**
- **Family history of hypothyroidism or hyperthyroidism**
- **Irradiation to head, neck region (in case of childhood cancers), medication, goitrogens in diet**
- **Newborn: maternal exposure to iodine/antithyroid drugs**

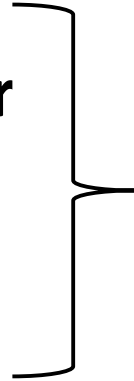
Examination

- **Measure sleeping heart rate, temperature, skin texture**
- **Examination of salivary glands, lymph nodes**
- **Tanner staging for pubertal status (pubertal thyroid enlargement is common)**

- **Stand at the back or on each side of the patient and then examine**
- **On palpation, examine for nodularity (single or multinodular), consistency, surface, tenderness**
- **Tender, erythematous swelling: Suppurative thyroiditis**
- **Firm, irregular, painless single nodule: Malignancy**
- **Auscultation for bruit**

Investigations

- **To determine causative factor**
- **Assessing thyroid status**



**Decide
further management**

Physical examination

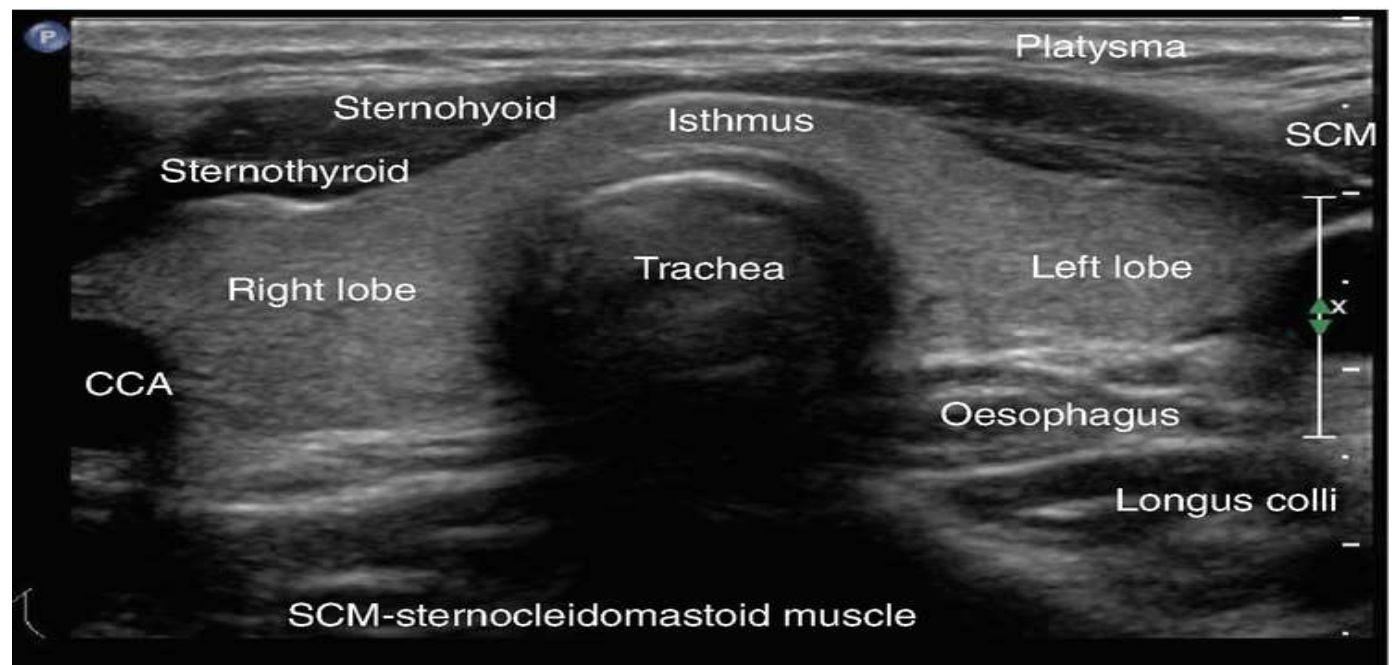
- **Cosmetic concerns: Reassurance if physiological**
- **Initiating thyroxine treatment:**
 - **Goals and expectations discussed with family**
 - **Size of goitre stops increasing after treatment initiated**
 - **Size reduction does not happen dramatically and is not the aim of treatment**

Thyroid biochemical profile

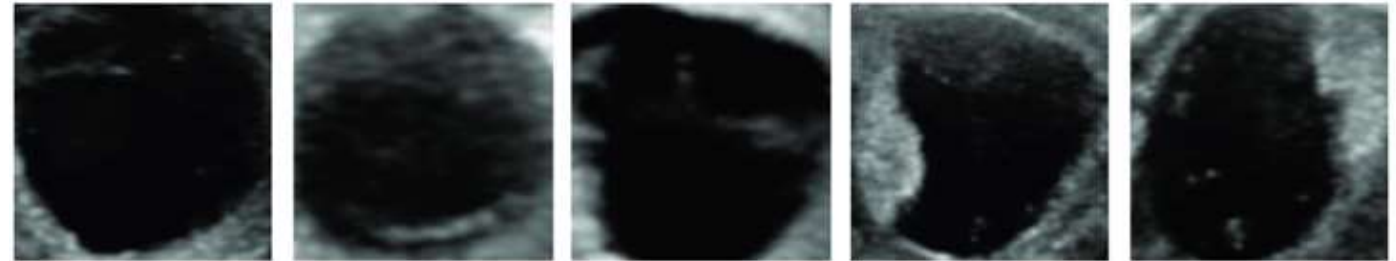
TSH, FT4, Anti-TPO/TG antibodies-

- **Colloid goiter: Anti-TPO/TG antibodies: Negative**
- **Chronic lymphocytic thyroiditis: Anti-TPO/TG Antibodies positive**
- **Graves disease: TSH receptor antibodies (TRAb)**

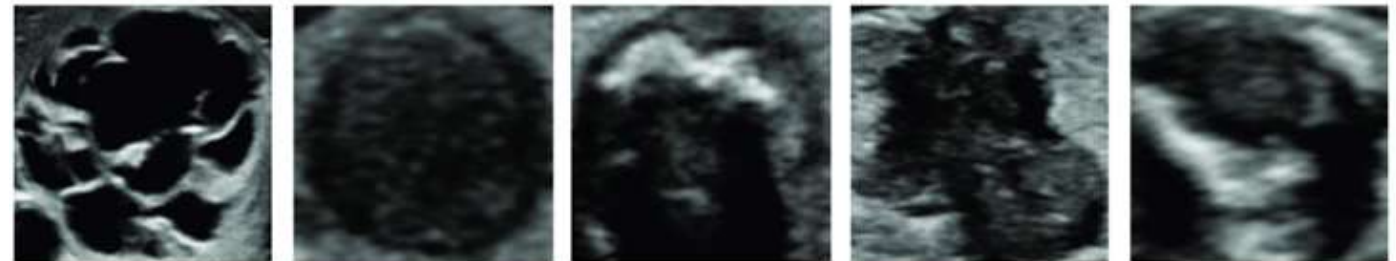
USG Thyroid



Normal Thyroid Gland



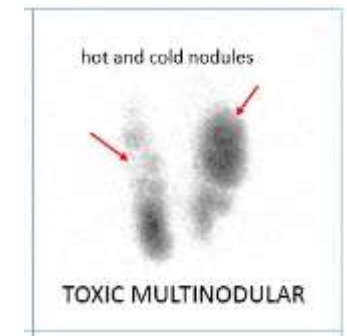
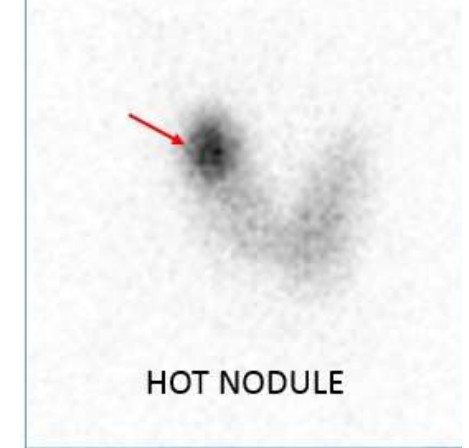
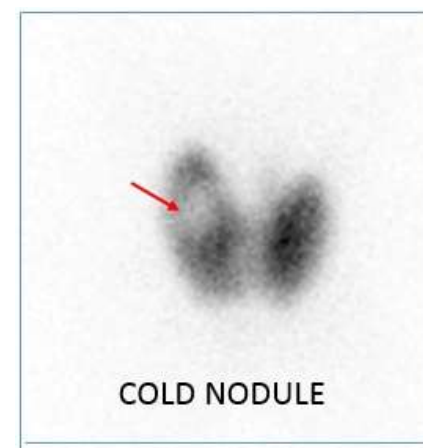
(a) Benign Thyroid Nodule



(b) Malignant Thyroid Nodule

RAIU scan

- Differentiate between hyper-functioning (hot) and hypo-functioning nodule (cold)
- Malignancy



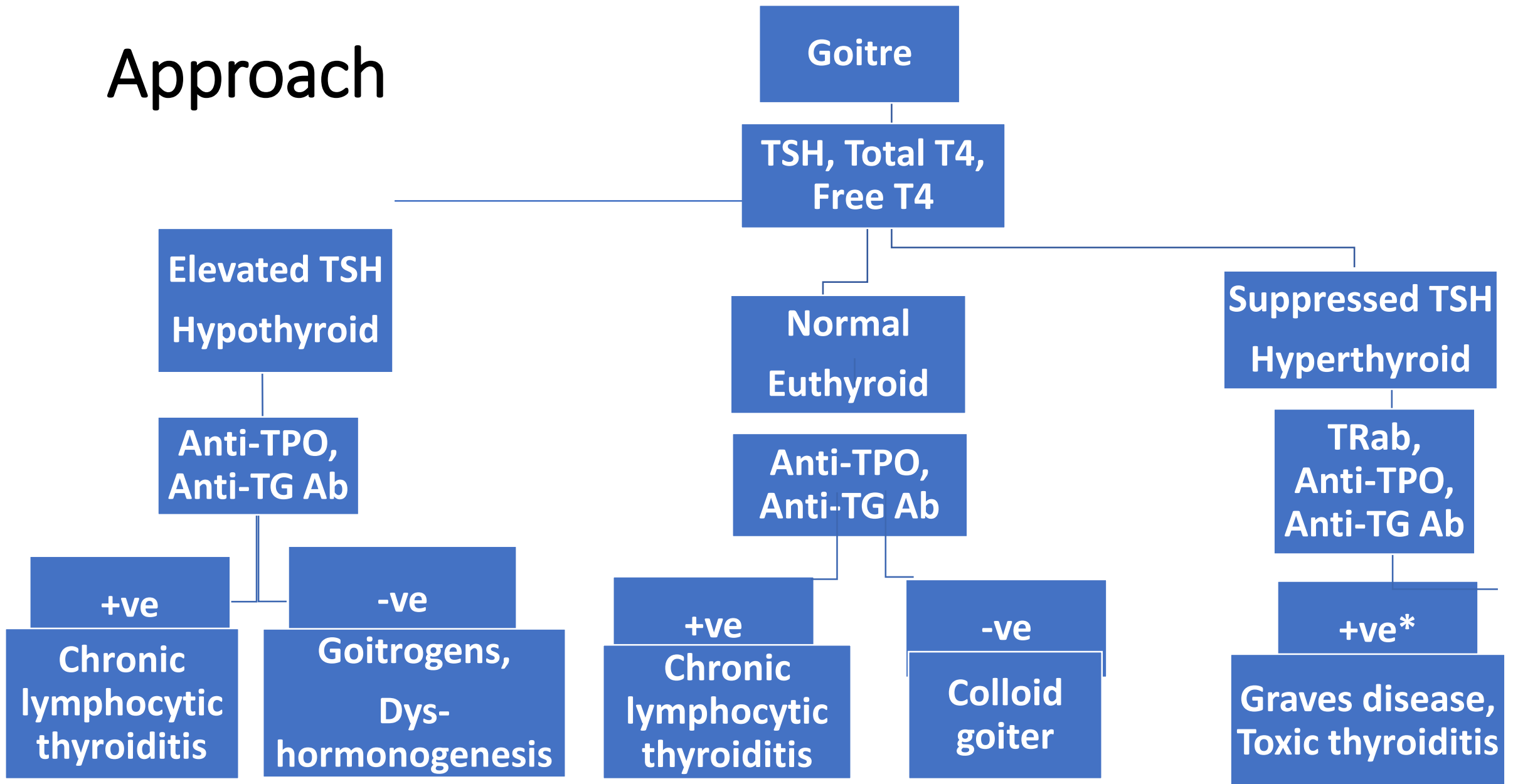
FNAC

- Solid hypoechoic nodules >1 cm
- Nodule suggestive of malignancy: Hypoechoic, microcalcifications, irregular borders, increased vascularity, abnormal adjacent lymph nodes

Thyroid
oncogenes

- *BRAF*, *RAS* oncogene, *RET/PTC* rearrangement

Approach



*Negative antibody titers do not rule out Graves disease.

Treatment

Use iodized salt.

Hypothyroid Goitre

- **Thyroxine replacement is given**
- **Decrease in goitre size gradually over 2-3 years**

Euthyroid Goitre

- **Thyroxine replacement: controversial**
- **TSH (<10 mIU/L) : monitor =**
 - **Pre-pubertal: 6 monthly,**
 - **Post-pubertal: annually**
- **TSH (10 to 20 mIU/L):**
 - **treatment continued till growth complete**

Role of surgery

Relapsed Graves disease

Nodular and multinodular goitre

Large goitre causing compression symptoms

GOITRE CASE



**13 year old girl with goitre, no other symptoms, menarche attained 1 year ago
Normal growth, menses & no palpitations**

FEATURES:

- **Euthyroid biochemically**
- **Common with new onset of puberty**
- **Self-limiting; does not need treatment; monitor TFT & growth every 3-6 months**

Discharging Sinus /Fistula - anterior part of neck

THYROGLOSSAL CYST



Take home messages

- **Early detection is the key: Goitre can have various causes, including:**
 - Iodine deficiency,**
 - Autoimmune disorders,**
 - Congenital thyroid abnormalities**

} **Treatment will depend on the underlying cause**
- **Goitre appearing during pubertal years are commonly euthyroid**
- **Central hypothyroidism is not usually associated with goitre**
- **Any firm, irregular, painless, rapidly growing, single nodule:**
RULE OUT malignancy

Thank you