

ENDOCRINE - NECK

STEPS OF EXAMINATION

Step 1: Approach the patient

- Read the instructions carefully for clues
- Shake hands, introduce yourself
- Ask permission to examine him

Step 2: General inspection:

	Thyrotoxicosis	Hypothyroidism
General appearance	<ul style="list-style-type: none"> ▪ Under/average built, <i>anxious, restless</i> 	<ul style="list-style-type: none"> ▪ Average built or overweight, <i>apathetic</i>, thinning hair, “peaches and cream” complexion
Face	<ul style="list-style-type: none"> ▪ <i>Lid retraction</i> (staring eyes): indicated by visible sclera above the cornea (normally covered by the upper eyelid). This result from sympathetic stimulation of the levator palpebrae superioris in thyrotoxicosis of any aetiology ▪ <i>Lid lag</i>: ask the patient to follow the slow downward movement of your finger at a distance of about 50 cm. In thyrotoxicosis, the upper lid lags behind the descending eyeball ▪ Grave’s ophthalmopathy (exophthalmos, periorbital oedema, conjunctival injection, chemosis) 	<ul style="list-style-type: none"> ▪ Thickened and coarse facial features ▪ Periorbital puffiness, loss of outer third of eyebrows (unreliable), xanthelasma
Hands	<ul style="list-style-type: none"> ▪ Thyroid acropachy, <i>warm and sweaty</i> hands, palmar erythema ▪ Pulse: <i>tachycardia</i> (note specifically the presence or absence of AF) ▪ <i>Fine tremors</i>: tell the patient “<u>Hold your arms outstretched in front of you, like this (with dorsum facing upwards), and maintain this position</u>” If the tremor is not obvious, place your palm against his outstretched fingers to feel for it. Alternatively, you can place a piece of paper on the dorsum of his out-stretched hands – it will oscillate if a fine tremor is present. 	<ul style="list-style-type: none"> ▪ <i>Dry and cold</i> ▪ Pulse: <i>bradycardia</i> ▪ Carpal tunnel syndrome: Tinel’s or Phalen’s test
Neck	<ul style="list-style-type: none"> ▪ Obvious goitre (nodular or symmetrical), scars (hemi/total thyroidectomy) 	<ul style="list-style-type: none"> ▪ Obvious goitre (nodular or symmetrical), scars (hemi/total thyroidectomy)
Legs & feet	<ul style="list-style-type: none"> ▪ Pretibial myxoedema (Grave’s) 	<ul style="list-style-type: none"> ▪ Non pitting pretibial oedema ▪ <i>Slow relaxing ankle jerk</i>: best demonstrated with the patient kneeling on a chair or bed with the feet hanging over the edge, and the examiner standing behind the patient.

N.B. Words in ***Bold Italic*** font indicates signs of disease activity

Step 3: Examine the thyroid:

- **Inspection:** Arrange the patient comfortably in chair, give him a glass of water and tell him “take a sip of water and hold it in your mouth” Look at the neck and tell the patient “now swallow” watch the upward movement of the goitre, or the appearance of a nodule not visible before swallowing (behind sternomastoid). The thyroid moves upwards on swallowing since it is enveloped in the pretracheal fascia, which is attached to the cricoid cartilage. A thyroglossal cyst will move upwards on swallowing and protrusion of the tongue, and can be transilluminated. If there is no evidence of a goitre so far you may wish to check for lymphadenopathy before feeling for a goitre (particularly if there is visible enlarged lymph nodes)
- **Palpation:** Ask the patient’s permission to feel the neck and apologize for any discomfort you may cause. Approach him from behind and ask him to lightly flex the neck. Feel the isthmus of the gland with your right index and middle fingers (lies over the trachea two finger widths below the thyroid cartilage). Then palpate the two lobes of the thyroid gland (one lobe at a time) which extend laterally behind the sternomastoid muscle. Ask the patient to swallow some water again while you continue to palpate the thyroid. Extend palpation upwards along the medial edge of the sternomastoid muscle on either side to look for a pyramidal lobe. If there is goitre, note its size, consistency (soft like the lips, firm like the tip of the nose or hard like the forehead), texture (nodular or diffusely enlarged), mobility (moves readily on swallowing?), tenderness, and test sternomastoid function (this muscle may be infiltrated in thyroid malignancy)
- **Percuss** over the upper sternum to assess any retrosternal extension of goitre. You may wish to elicit **Pemberton’s sign** (on raising the arms above the head, patients with retrosternal goitres may develop signs of compression, i.e. suffusion of the face, syncope or giddiness)
- **Auscultate** over the thyroid gland for bruit (vascular murmur) – classically occurs in Grave’s disease. You may need to occlude venous return to rule out a venous hum, and to listen over the aortic area to ensure that the thyroid bruit you hear is not an outflow obstruction murmur conducted to the root of the neck.

Step 4: Lymphadenopathy: (supraclavicular/cervical lymphadenopathy may associate thyroid cancer or acute thyroiditis)

- **Technique:** palpate one side at a time using the flat fingers of one hand and compare with the glands on the contralateral side (assess site, size, consistency, mobility and tenderness).
- **Sequence:**
 - **From behind** with the patient sitting and the head slightly tilted to the side under palpation:
 - Examine the (1) **supraclavicular** nodes by placing your fingertips in the supraclavicular fossae then place your index finger between the clavicle and sternocleidomastoid muscle and press down gently towards the first rib to feel the scalene node (felt as a soft mobile mass just above the hard first rib).
 - Then examine the (2) **deep cervical** lymph nodes behind the anterior border of the sternomastoid.
 - Then examine the (3) **submental**, (4) **submandibular** and (5) **preauricular** nodes
 - **From the front** of the patient:
 - Examine the (1) **posterior triangles**, up the back of the neck and
 - Then examine the (2) **postauricular** and (3) **suboccipital** nodes
 - If you do find lymph nodes, proceed to examine the axillary and inguinal lymph nodes for evidence of generalized lymphadenopathy (lymphoma, CLL)
 - **Axillary nodes:** examine the right axilla from the right side of the patient and vice versa. Ask the patient to relax his right arm on you examining hand (left hand) a little away from the chest wall (use your left hand to examine the right axilla, and vice versa). Gently place your fingertips into the vault of the axilla and then draw them downwards feeling the **medial**, **anterior**, and **posterior** walls in turn
 - **Inguinal glands:** palpate over the horizontal chain, just below the inguinal ligament, and then over the vertical chain along the line of the saphenous vein.
 - Note whether the lymph nodes are:
 - Separate (reactive hyperplasia, infectious mononucleosis, lymphoma, etc.) or matted together (neoplastic, tuberculous)
 - Mobile or fixed to the skin or deep tissues (neoplastic)
 - Soft, fleshy, rubbery (Hodgkin’s disease) or hard (neoplastic)
 - Look for a scar from lymph node biopsy and radiotherapy markings and look in the mouth for pharyngitis and palatal Petechiae (infectious mononucleosis), tonsillar infiltration (CLL) or primary malignancies. Ask the examiners permission to feel for the liver and spleen and express your wish to examine the chest clinically and radiologically (TB or CA)

Step 5: Check for tracheal displacement: place the index and ring fingers over the prominent points on either side of the manubrium sternae. Use the middle finger to feel the tracheal rings to detect tracheal deviation

Step 6: If there is a thyroidectomy scar, test for **Chvostek's sign** (hypoparathyroidism): tap over the facial nerve 3-5 cm in front of the tragus of the ear. The test is positive if this manoeuvre evokes involuntary twitching of the lips and facial muscles

Step 7: Additional findings (complications):

- **Ankle jerk:** *brisk* in thyrotoxicosis and *slow relaxing* in hypothyroidism (best demonstrated with the patient kneeling on a chair or bed with the feet hanging over the edge, and the examiner standing behind the patient)
- **Proximal myopathy** (thyrotoxicosis): test shoulder abduction by telling the patient "Hold your arms up, like this (chicken wings). Now keep them up and don't let me push them down"
- **Carpal tunnel syndrome** (hypothyroidism): **Phalen's test** (reversed prayer sign) and/or **Tinel's tests** (tapping of the nerve at putative site of compression) will produce paraesthesiae in the distribution of the nerve (see *Ch 13. Locomotor - Hand*)
- **Ophthalmoplegia:** test the pursuit eye movement (see *Ch 18. Eye – General*). Limitation of upward gaze is the most common abnormality in Grave's ophthalmopathy. However the combination of enlarged ocular muscles ± subsequent fibrosis may lead to complex ophthalmoplegia that is not explained by either single nerve or muscle disease.
- **Bitemporal visual field defects** (pituitary tumours)
- **Fundus examination:** optic nerve compression causing visual failure in Grave's
- **BP** (hypertension due to hypercholesterolaemia with hypothyroidism)
- **Urine dipstick for sugar** (DM type 1 with autoimmune hypothyroidism)

Step 8: Thank the patient and cover him (her)

THEORETICAL NOTES

Thyrotoxicosis: excess thyroid hormone

Hyperthyroidism: hyper-function of the thyroid gland

Causes of Thyrotoxicosis

- **Primary hyperthyroidism**
 - Graves' disease
 - Toxic multinodular goitre
 - Toxic adenoma
 - Functioning thyroid carcinoma metastases
 - Activating mutation of the TSH receptor (autosomal dominant)
 - Struma ovarii
 - Drugs: iodine excess (Jod-Basedow phenomenon)
- **Thyrotoxicosis without hyperthyroidism**
 - Subacute thyroiditis
 - Silent thyroiditis
 - Other causes of thyroid destruction: amiodarone, radiation, infarction of adenoma
 - Ingestion of excess thyroid hormone (thyrotoxicosis factitia) or thyroid tissue
- **Secondary hyperthyroidism**
 - TSH-secreting pituitary adenoma
 - Thyroid hormone resistance syndrome: occasional patients may have features of thyrotoxicosis
 - Chorionic gonadotropin-secreting tumours and gestational thyrotoxicosis (Circulating TSH levels are low in these forms of secondary hyperthyroidism)

The hyperthyroidism of Graves' disease is caused by thyroid stimulating immunoglobulins (TSI) that are directed to the TSH receptors (TSH-R)

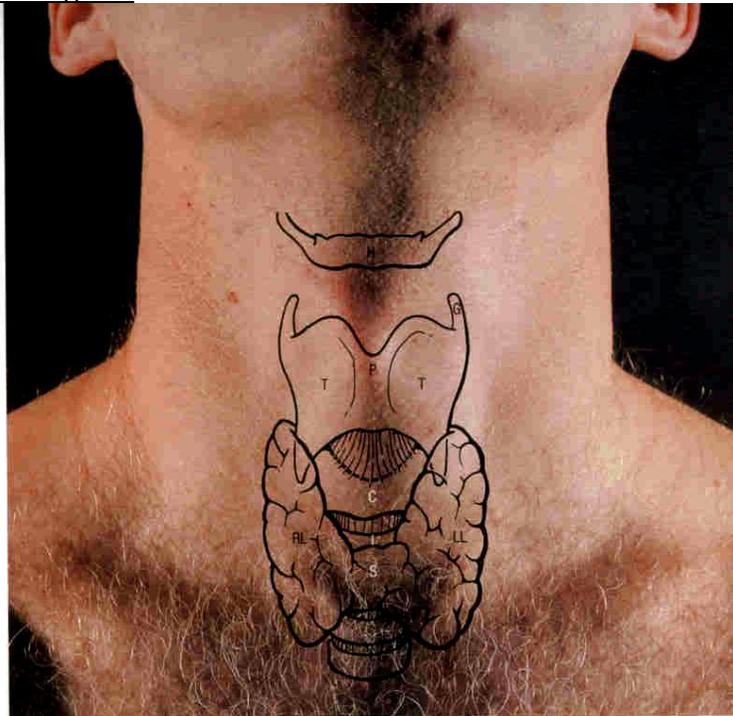
Hands in thyroid disease:

- **Thyroid acropachy:** a form of clubbing found in <1% of thyrotoxic Graves' disease
- **Palmar erythema** (thyrotoxicosis of any cause)
- **Tar staining** (thyroid ophthalmopathy is worse in smokers)
- **Feel the palm:** warm and sweaty (thyrotoxicosis), or cool and dry (hypothyroidism). N.B. cold and sweaty in anxiety
- **Pulse:** slow in hypothyroidism and fast in thyrotoxicosis - note specifically the presence or absence of AF
- **Fine tremors** (thyrotoxicosis)

Eyes in thyroid disease:

- **Features of thyrotoxicosis from any cause:**
 - **Lid retraction** (staring eyes)
 - **Lid lag:** ask the patient to follow the slow downward movement of your finger at a distance of about 50 cm; the upper lid lags behind the descending eyeball.
- **Thyroid ophthalmopathy of Grave's disease** - (also occurs in about 5% of patients with autoimmune hypothyroidism):
 - **Exophthalmos/proptosis:** sclera visible below the cornea (normally covered by the lower eyelid) with the patient sitting at the same level as you and looking straight ahead. This sign is not related to thyroid status and occurs only in Grave's disease. unilateral exophthalmos could be due to Grave's disease, however in such a case a retro-orbital tumour should always be considered
 - **Soft tissue signs:** periorbital oedema, conjunctival injection, chemosis
 - **Ophthalmoplegia/diplopia:** test the pursuit eye movement (see *Ch 18. Eye - General*). Limitation of upward gaze is the most common abnormality in Grave's ophthalmopathy. However the combination of enlarged ocular muscles ± subsequent fibrosis may lead to complex ophthalmoplegia that is not explained by either single nerve or muscle disease.
 - **Optic nerve compression** causing visual failure
- **Ptosis** is very rarely encountered in either Grave's disease or hyperthyroidism. Its presence should raise the possibility of coexistent myasthenia gravis.

Surface anatomy of the thyroid gland



OBSERVE:

- **The hyoid bone (H)** lies at the angle between the floor of the mouth and anterior aspect of the neck
- **The laminae of the thyroid cartilage (T)** project anteriorly from their point of union to form the laryngeal prominence (P); the superior horn (G) is palpable
- **The arch of the cricoid cartilage (C)** projects further anteriorly than the rings of the trachea and lies at the level of C6
- **The first tracheal ring (I)**
- The thyroid gland consists of **right (RL) and left (LL) lobes** and a connecting **isthmus (S)**

Structures related to the thyroid gland

