Common Neck Swellings

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Objectives:

1. List the different common causes of a neck swelling in an adult.
2. Classify the different causes of a thyroid swelling.
3. Describe the different types of thyroid malignancy and the main principles of management.
4. Indicate the important investigative tools for the common neck swellings.
5. Explain the pathophysiology of primary hyperparathyroidism, its clinical presentation, investigations, and management.

Color Index:

-Slides -Important -Doctor's Notes -Davidson's Notes -Surgery Recall -Extra

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Introduction:

The most important structures in Anterior triangle of the neck are

1. Thyroid
2. Parathyroid (not usually palpable)
3. Submental Lymph Nodes
4. Thyroglossal cyst

Lymphadenopathy most common in the posterior triangle

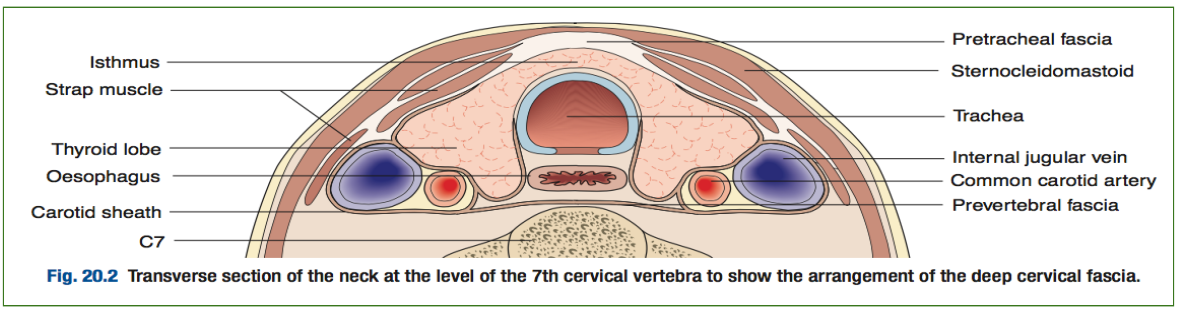


Fig. 20.2 Transverse section of the neck at the level of the 7th cervical vertebra to show the arrangement of the deep cervical fascia.

1.THYROID

Thyroid enlargement it's either single (Solitary), Multinodular or Diffuse..

Causes of Goiter:

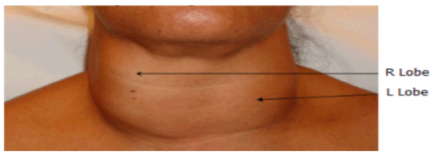
1.Physiological goiter	2.Multinodular goiter	3.Inflammatory
increase The demand, the body needs thyroxine and the gland will try to compensate. Usually not extremely enlarged. In (pregnancy, Puberty..)	Hyperplasia of the cells because of: iodine deficiency, side effect of "lithium" or problem in the synthesis (idiopathic). Start as simple goiter then becomes nodular. After years some of the nodules will produce excessive amount of thyroxine. We call it (toxic multinodular goiter). "فزعة"	Usually the type of the inflammation in the thyroid is autoimmune. Acute/subacute inflammation is extremely rare, chronic inflammation is common "Hashimoto's thyroiditis" It is difficult to differentiate between inflammatory and simple goiter by signs and symptoms, you need to do aspiration and biopsy.
4.Thyroid cyst	5.Benign tumor 90%	6.Malignancy 10%

Causes of a solitary thyroid nodule:

- Thyroid cyst
- Dominant nodule in a multinodular goiter:The commonest, sometimes only one nodule is palpable, giving the erroneous impression of a solitary nodule.
- Degeneration or hemorrhage into a colloid cyst or nodule
- Benign tumor Follicular adenoma
- malignancy

-"Thyroid gland it located behind a fascia "pretracheal fascia", it is difficult to differentiate solid mass or cyst by examination"

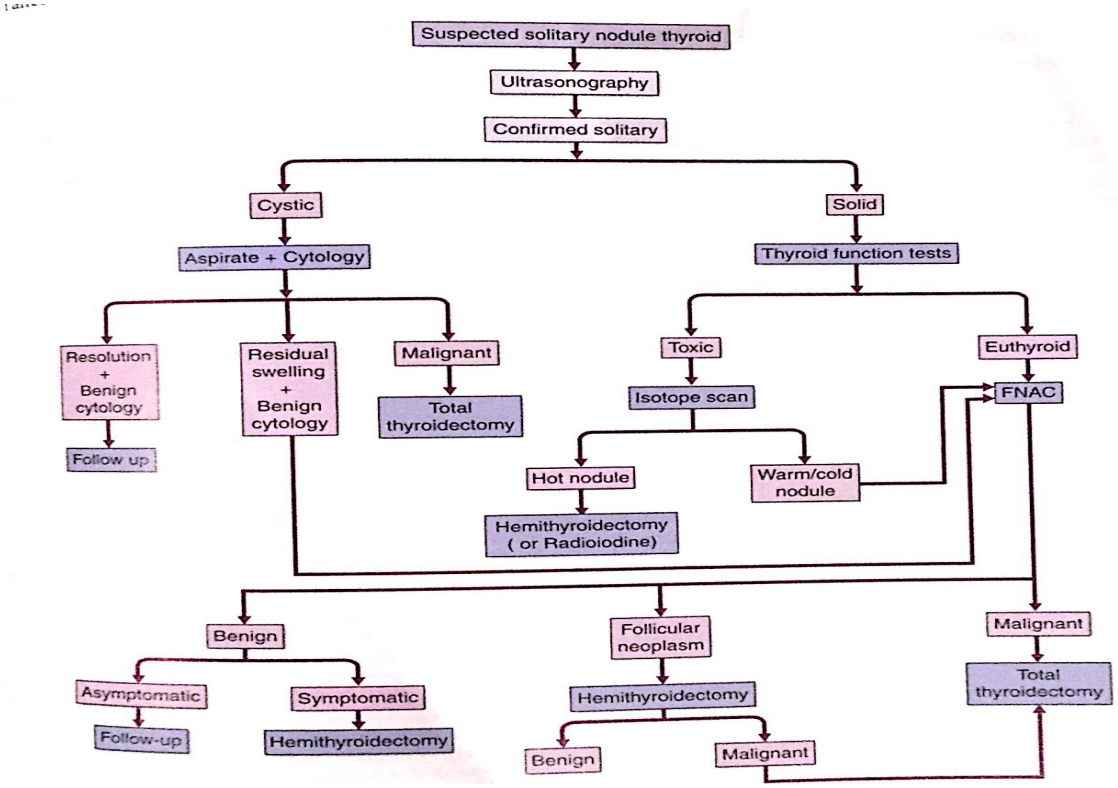
-"Ultrasound and FNA is the best options to differentiate between them"

Thyroid cyst	Multinodular Goiter
	
	
-You can remove the cyst by FNA. but if the cyst reoccur again it's better to do lobectomy (it is rare to recur)	-Functional problem -Common in iodine deficiency area

Management of patient with solitary thyroid nodule:

*The pivotal diagnostic test is fine-needle aspiration cytology, complemented by ultrasonography, isotope scans and thyroid function tests.

*Very rarely, a cyst contains a carcinoma (often papillary) within its wall, and blood-stained aspirate or a residual swelling after aspiration should raise this possibility.



Inflammatory Thyroiditis:

- Commonest is Hashimoto's Thyroiditis, it's also the commonest cause of hypothyrodis.
- *Subacute thyroiditis (de Quervain's disease):*

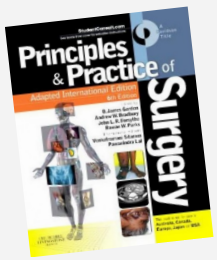
rare condition is associated with an influenza-like illness, during which there is painful diffuse swelling of the gland. Thyroid antibodies may appear in the serum. The disease may be due to a viral infection and usually resolves spontaneously.

- *Riedel's thyroiditis*

very rare condition the thyroid is replaced by dense fibrous tissue, resulting in a firm painless swelling and tracheal compression. The cause is unknown. Surgery is reliably difficult but decompression of the trachea may be required.

Summary:

- Physiological thyroid enlargement may occur during puberty or pregnancy
- Non-toxic nodular goitre can be associated with iodine deficiency and drug reactions; it is usually asymptomatic but can cause compression symptoms
- Thyrotoxic goitre results from stimulation of the gland by TSH or TSH-like proteins, resulting in excessive production of T_3 and T_4. About 25% of cases of thyrotoxicosis are due to a toxic multinodular goitre
- (a long-standing non-toxic goitre develops hyperactive nodule(s) that function independently of TSH levels)
- Thyroiditis can produce diffuse painful swelling that may be subacute (de Quervain's disease) or autoimmune (Hashimoto's disease). Riedel's thyroiditis is a very rare cause of painless thyroid swelling and tracheal compression.
- A solitary thyroid nodule is often a conspicuous palpable nodule in a multinodular goitre. True solitary nodules may be adenomas, cysts or cancers, conditions that are distinguished by fine-needle aspiration cytology, ultrasonography, isotope scans and function tests.
- Thyroid cancers can produce a goitre, particularly in the case of medullary carcinoma of the thyroid and lymphoma.



Malignant tumors of the thyroid:

General Characteristics:

- Painless enlarging nodule
- Whenever you see cold nodule⇒ Suspect malignancy.
- Lymphadenopathy⇒ high chance of malignancy (specific for malignancy, but not sensitive. More than 95% of the malignancy conditions don't have lymphadenopathy "they present early)
- Hoarseness of voice recurrent laryngeal nerve involvement: malignancy or iatrogenic. (also specific 99%, but not Sensitive)
- Dysphagia because of the size
- Function is usually normal

Type	Characteristics
Papillary Carcinoma  	85% Commonest. Incidence is increasing: ● Exposure to radiation ● Familial types Painless nodule . Young age ⇒ **A goiter in a child is papillary carcinoma until proven otherwise.** Female:Male⇒ 3:1 It affects females more and earlier in age than males Microscopically: Psammoma bodies+Orphan annie nuclear inclusions may be found.. Management: is commonly multifocal⇒ thus total thyroidectomy is the optimal surgical procedure, it's also has the advantage of early detection of metastasis by using radioactive iodine scan as no functional thyroid is left in the body after surgery **"so whatever is shown in the scan is not thyroid, it's metastasis"** Spreads to lymphatics which does not affect the staging. Metastasizes to lung & bone. Good prognosis especially in females.
Follicular Carcinoma	10% Older patients than papillary Management:Treatment consists of total thyroidectomy with preservation of the parathyroids. If a postoperative radioisotope scan (challenge scan) reveals increased uptake in the skeleton or neck, therapeutic doses of radioiodine are given. Mets by blood to lung & bone The metastasis is functioning and we can use the for prognosis and diagnosis Takes radio-nuclear iodine
Lymphoma	< 5%

	Approximately 1-5% of all thyroid malignancy Risk increased in Hashimoto's thyroiditis Usually diagnosed by pathology Treat as lymphoma anywhere -there is an association between lymphoma and hashimoto's thyroiditis, How to deal with it? Like any lymphoma in the body: staging, Chemo, radio
Medullary	< 5% Medullary Carcinoma⇒ Originate from c cells which present in pancreas and adrenal also.. 25% hereditary, If child presents with early sign⇒is better to do thyroidectomy before it progresses Calcitonin levels are elevated, and can be used to monitor progress and screen relatives. The tumour may occur sporadically or as part of an inherited multiple endocrine neoplasia MEN 2 syndrome (Sipple's syndrome) A&B Management: -Treatment consists of total thyroidectomy and, if the calcitonin level is raised, dissection of the lymph nodes in the central compartment of the neck. -Preoperative CT of the neck and mediastinum is advised and the exclusion of a phaeochromocytoma before neck surgery is mandatory -If pheochromocytoma is present resect manage it 1st, click to read more about the management.. -DO screening for whole other regions + family screening. Bad prognosis (aggressive tumor)
Undifferentiated	1% Elderly patients Metastasis: Local invasion may involve the recurrent laryngeal nerve(s) and cause hoarseness, the trachea causing dyspnoea and stridor, and the oesophagus causing dysphagia. Invasion of the cervical sympathetic nerves may cause Horner's syndrome (contraction of the pupil, enophthalmos, narrowing of the palpebral fissure and loss of sweating on the face and neck). Pulmonary metastases are common. Management: -Both resection and chemotherapy didn't show any value, external beam radiation may be value. -The goal is to relive the tracheal compression Worst prognosis

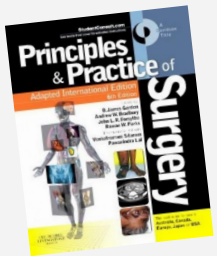
Investigations:

- Ultrasound "1st diagnostic method"
- Fine Needle Aspiration (FNA)
- FNA/Bethesda System "the main diagnostic method"
- Thyroid uptake scan (basically nuclear medicine)

FNA/Bethesda System (The doctor said it is not important).	
Diagnostic Category	**Risk %**
Non-diagnostic	1-4
Benign	0-3
Atypia of undetermined significance or Follicular lesion of undetermined Significance	5-15
Follicular Neoplasms or Suspicious for a Follicular Neoplasm	15-30
Suspicious for Malignancy	60-75
Malignant	97 -99

Summary:

- **Thyroid cancers may arise from the epithelium**
- **(papillary 50%, follicular 30%). Remainder comprise anaplastic, parafollicular C cells (medullary carcinoma) or lymphoreticular tissue (lymphoma)**
- **Papillary cancers are rare after the age of 40 years, are often multifocal and spread to lymph nodes, but rarely disseminate widely. Total or near-total thyroidectomy with the removal of involved nodes may be followed by radioiodine, and thyroid replacement therapy to suppress TSH. Ten-year survival rates approach 90%**
- **Follicular carcinoma occurs in the 30–50-year age group, spreads preferentially via the bloodstream, and is treated by total thyroidectomy. Residual neck or skeletal radioisotope uptake signals the need for radioiodine therapy. T_4 is used routinely to suppress TSH production. The 10-year survival rate is 75%**
- **Anaplastic carcinoma occurs in older patients, spreads locally and frequently gives rise to pulmonary metastases. Curative resection is rarely possible, radiotherapy/chemotherapy is of little value, and most patients die within 1 year**
- **Medullary carcinomas secrete calcitonin, may involve both lobes, and involved neck nodes. They may be sporadic or part of MEN II. Treatment consists of total thyroidectomy and node dissection.**

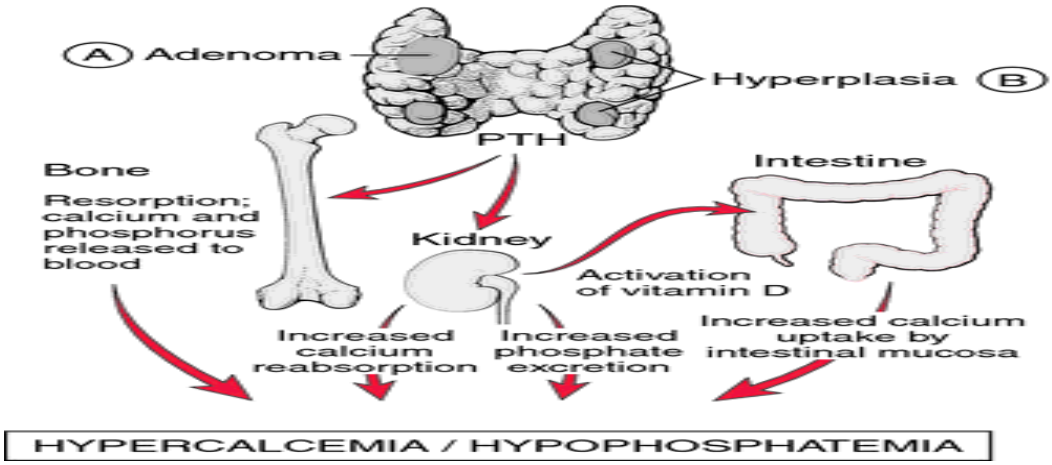


2.Primary Parahyperthyroidism "Under diagnosed disease":

- Statistics from Western countries indicate a 0.1-0.5% prevalence rate for PHP.
- No evidence for geographical variation
- The commonest cause of hypercalcemia in KKUH is malignancy
- In ksu the patient presented with recurrent renal stones or multiple fractures.
- Commonest cause of Hypercalcaemia in society
- Uncommon in children
- 2-3 times in females
- In 90% of patients, primary hyperparathyroidism is due to an adenoma, in 10% it results from hyperplasia (usually affecting all four glands), and in less than 1% it results from parathyroid carcinoma.
- If all or most of the glands are enlarged, a diagnosis of hyperplasia is likely.
- If only one gland is enlarged, a diagnosis of adenoma is favored.

Physiology:

- Parathormone hormone (high), Vitamin D (high), ca (high)



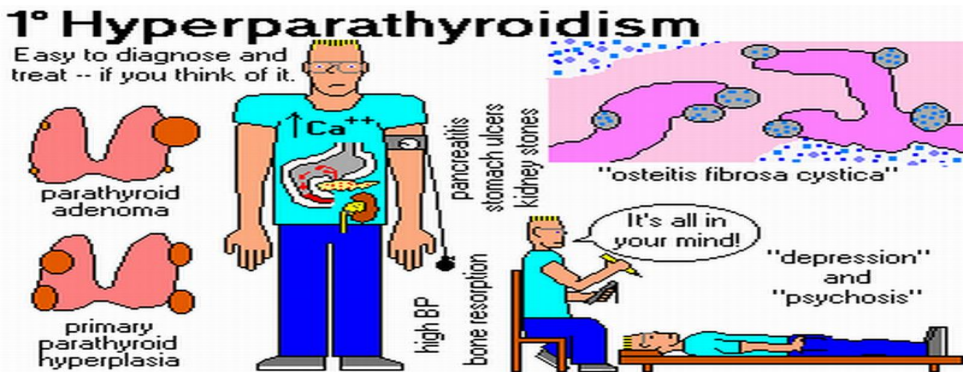
Clinical presentation:

- In the west 60 - 70% detected by routine screening.
- Many are asymptomatic

Case scenario: 40 y old lady # Lt humerus fracture Lt ureteric stone removed 6 y back Rt ureteric stone removed 3 y back Non functioning Lt kidney Serum Ca 11.2mg/dl Phosphorus 2.2mg/ dl	
DDx	
Adenoma	84%
Hyperplasia	15%
Carcinoma	1%

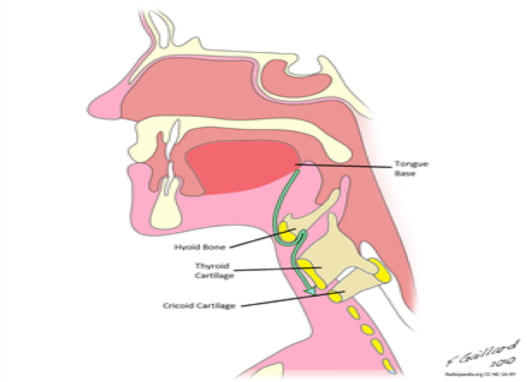
Primary Hyperparathyroidism

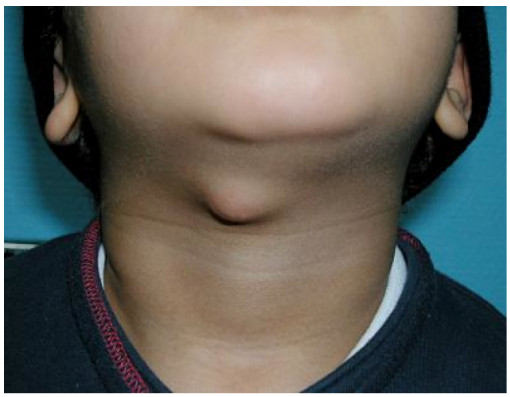
Clinical manifestations **No symptoms** **Mild symptoms** **Renal symptoms** **Bone symptoms**	• Renal stones • Bone and joint pains • Abdominal groans • Psychic moans • Fatigue overtones	• **Moth-eaten appearance of the skull,** describes multiple small endosteal lucent lesions or holes, often with poorly defined margins, with sparing of the cortex. It is a process. • Peptic ulcer
Investigations	• Serum Calcium • PTH • Serum Phosphate • Chloride High Serum Calcium+PTH⇒ is enough to confirm the dx of 1ry hyperparathyroidism.	
Management	• All symptomatic patients should be treated • Asymptomatic ?? • Ca Increased +++ • Bone density Decreased +++ • The aim is to remove all hyper-active parathyroid tissue	
Recommendations	• PHP is a very underdiagnosed disease in Saudi Arabia. • Patients are not diagnosed early • Complications could be serious and these are avoidable. • Specifically the diagnosis should be considered in patients with: -bilateral or recurrent renal stones -patients with suggestive radiological bone changes - and naturally in patients with high serum calcium level	



The dr didn't go through it

Thyroglossal cyst	
How does it develop ?	The thyroid gland begins its embryological development in the tongue base. As it descends into the neck, it remains attached to the tongue by the thyroglossal duct. This duct should completely atrophy, otherwise a thyroglossal cyst may develop.
Where does it locate?	This is a midline swelling usually situated just above the upper border of the thyroid cartilage.
On examination:	It moves on swallowing or tongue protrusion and can become infected.
How to diagnose:	Ultrasound can differentiate between thyroglossal cyst and thyroid.
Treatment:	by surgical excision (Sistrunk procedure). The center of the hyoid bone and the persistent thyroglossal duct in continuity with a cuff of tongue base should also be excised with the cyst to reduce the recurrence rate (up to 10%).





- Thyroglossal cysts (TGCs) are usually non-tender and mobile.
- Infected TGCs may present as a tender mass.
- A tender infected TGC may be associated with dysphagia, dysphonia, draining sinus, fever, or increasing neck mass.
- An infected TGC may present like an upper respiratory tract infection.
- Airway obstruction is possible, particularly with intralingual cysts close to the airway.

Investigations:

1. Thyroid function tests (TFTs): ectopic thyroid gland cannot be ruled out even in the presence of normal TSH levels and a clinically euthyroid history.
2. Ultrasound: can distinguish solid from cystic components.
3. CT scan: shows the capsular enhancement.

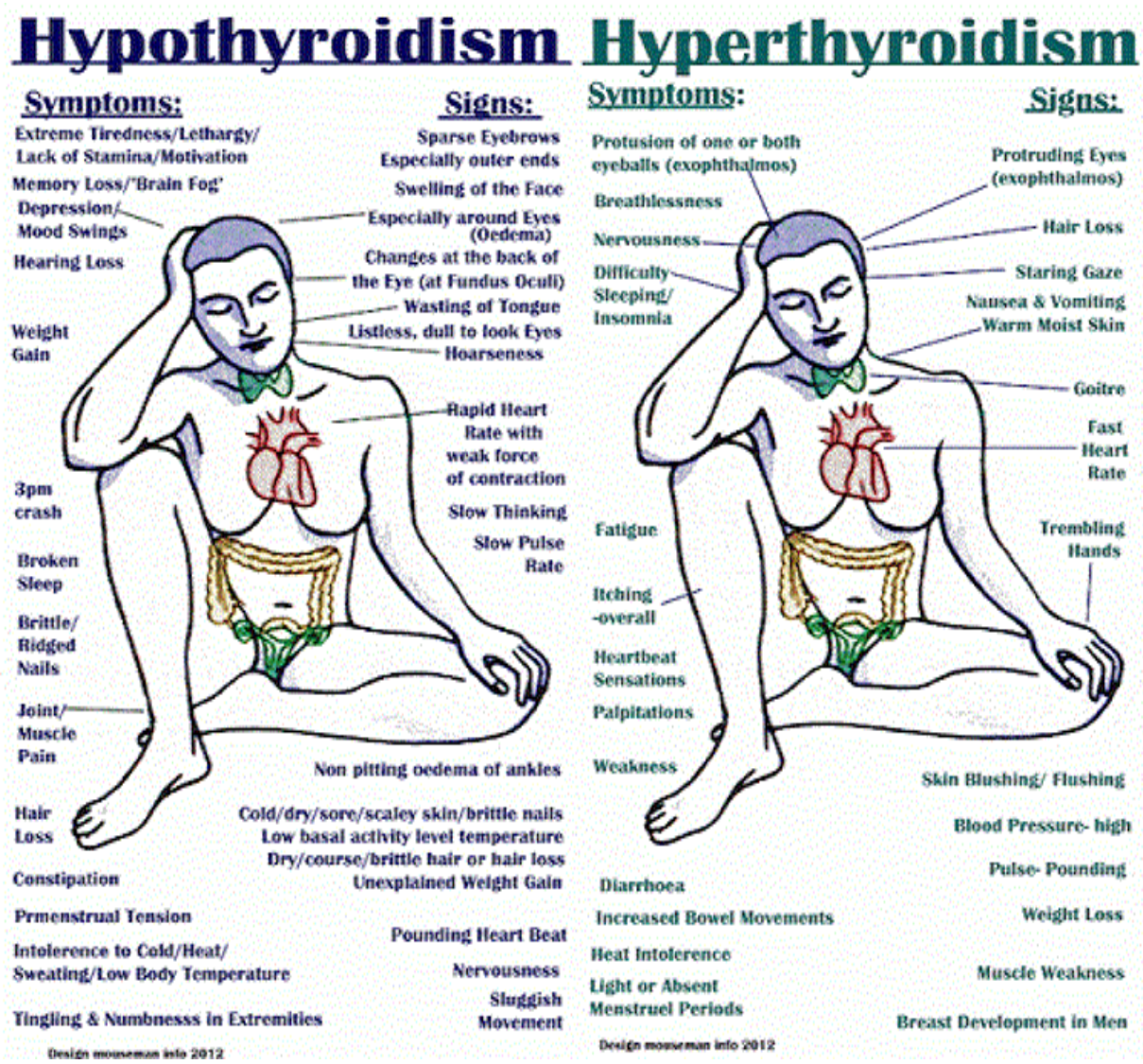
Causes of neck swellings	
Midline	**Lateral**
•Goiter. •Thyroglossal cyst. •Submental lymph nodes. •Parathyroid gland (very rare).	•Lymph nodes •Salivary glands (stones, tumor). •Skin (sebaceous cyst, lipoma). •Lymphatics (cystic hygroma). •Carotid body tumor. •Pharynx (pharyngeal pouch, branchial cyst).

Branchial cyst and fistula:

-Swellings lying laterally in the upper neck may be branchial cysts.
-They are thought to be remnants of the second and third branchial arches yet often present in young adults.
-The cysts contain opaque fluid with cholesterol crystals.
-Lymphoid tissue is found in their walls.
-They may become infected and usually require excision. -Branchial fistulae may occur between the skin surface, low in the neck, and the tonsil or lower pharynx internally.
-Infection often occurs and excision is usually required.

Other cystic swellings:

- **Cystic hygroma is a rare, benign lymphangioma of the neck, which usually presents in early life.**
  Complete excision is difficult, leading to frequent recurrence.
- **Dermoid cysts may also occur in the upper neck, usually in the midline or sub-mandibular area, in younger children. They contain skin appendages unlike sebaceous cysts. ---**
- **Laryngoceles occur as a result of herniation of laryngeal mucosa laterally into the neck. They distend with air during the Valsalva manoeuvre and may become infected. Excision is usually required.**


Hypothyroidism
Symptoms:
Signs:
Extreme Tiredness/Lethargy/ Lack of Stamina/Motivation
Memory Loss/'Brain Fog'
Depression/ Mood Swings
Hearing Loss
Weight Gain
3pm crash
Broken Sleep
Brittle/ Ridged Nails
Joint/ Muscle Pain
Hair Loss
Constipation
Prmenstrual Tension
Intolerence to Cold/Heat/ Sweating/Low Body Temperature
Tingling & Numbnesss in Extremities
Sparse Eyebrows Especially outer ends
Swelling of the Face
Especially around Eyes (Oedema)
Changes at the back of the Eye (at Fundus Oculi)
Wasting of Tongue
Listless, dull to look Eyes
Hoarseness
Rapid Heart Rate with weak force of contraction
Slow Thinking
Slow Pulse Rate
Non pitting oedema of ankles
Cold/dry/sore/scaley skin/brittle nails
Low basal activity level temperature
Dry/course/brittle hair or hair loss
Unexplained Weight Gain
Pounding Heart Beat
Nervousness
Sluggish Movement
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Hyperthyroidism
Symptoms:
Signs:
Protusion of one or both eyeballs (exophthalmos)
Breathlessness
Nervousness
Difficulty Sleeping/ Insomnia
Fatigue
Itching -overall
Heartbeat Sensations
Palpitations
Weakness
Diarrhoea
Increased Bowel Movements
Heat Intolerence
Light or Absent Menstruel Periods
Protruding Eyes (exophthalmos)
Hair Loss
Staring Gaze
Nausea & Vomiting
Warm Moist Skin
Goitre
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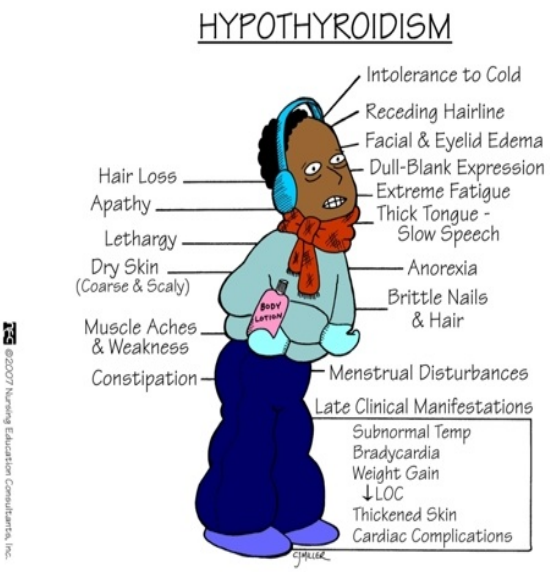
HYPOTHYROIDISM
Intolerance to Cold
Receding Hairline
Facial & Eyelid Edema
Dull-Blank Expression
Extreme Fatigue
Thick Tongue - Slow Speech
Anorexia
Brittle Nails & Hair
Menstrual Disturbances
Late Clinical Manifestations
Subnormal Temp
Bradycardia
Weight Gain
↓LOC
Thickened Skin
Cardiac Complications
Hair Loss
Apathy
Lethargy
Dry Skin (Coarse & Scaly)
Muscle Aches & Weakness
Constipation
BODY LOTION
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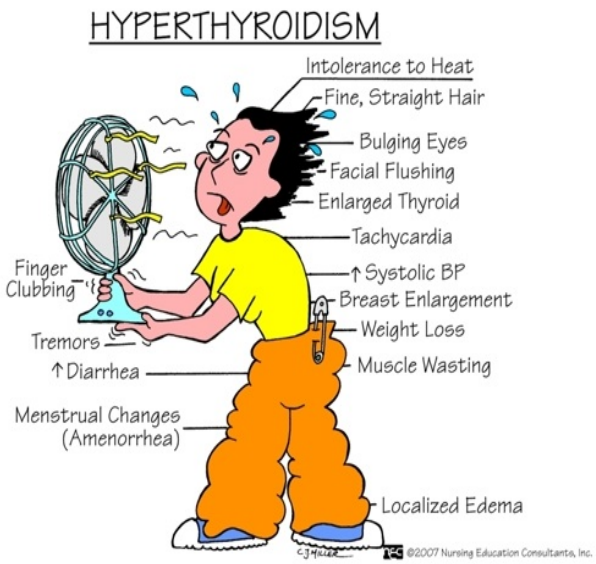
HYPERTHYROIDISM
Intolerance to Heat
Fine, Straight Hair
Bulging Eyes
Facial Flushing
Enlarged Thyroid
Tachycardia
↑Systolic BP
Breast Enlargement
Weight Loss
Muscle Wasting
Localized Edema
Finger Clubbing
Tremors
↑Diarrhea
Menstrual Changes (Amenorrhea)
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Case 1		
Scenario:	Fatima is a 30-year old Saudi lady that presented to the Outpatient clinic, complaining of a swelling in the midline of her neck that she had for 2 months.	
What could this be?	-Goiter -Thyroglossal cyst -Submental lymph nodes -Parathyroid gland (very rare)	
Is it a thyroid swelling?	Checked by: swallowing > not mobile: most likely thyroid. Mobile: most likely cyst.	
If it is a thyroid swelling, what could be the cause of this swelling?	Thyroid cyst Benign tumor Multinodular goiter	Inflammatory Physiological goiter malignancy

Case 2	
Scenario:	Ahmed (age 28 years) came to the Outpatient clinic complaining of nervousness, palpitations, sweating, and weight loss. Clinical examination revealed the presence of a goitre.
What could this be?	-Graves disease -Toxic multi-nodular goiter -Toxic follicular adenoma -Others
How would you manage the patient?	Medical Radio-nuclear iodine Surgery

Surgical Recall

1.Define the arterial and venous blood supply to the thyroid?

Arterial	Venous
1.Superior thyroid artery (first branch of the external carotid artery). 2. Inferior thyroid artery (branch of the thyrocervical trunk) (IMA artery rare).	1. Superior thyroid vein 2. Middle thyroid vein 3. Inferior thyroid vein

2. Which ligament connects the thyroid to the trachea? Ligament of Berry

3.Mention the complication of each nerve injury during thyroidectomy?

Recurrent laryngeal nerves	Paralyzes laryngeal abductors and causes hoarseness if unilateral, and airway obstruction if bilateral
Superior laryngeal nerve	Patient will have a deeper and quieter voice (unable to hit high pitches)

4.What is the differential diagnosis of a thyroid nodule?

Multinodular goiter, Adenoma ,Hyperfunctioning adenoma
Cyst, Thyroiditis, Carcinoma/lymphoma, Parathyroid carcinoma

5.What are the "P's" of papillary thyroid cancer (7)?

Papillary cancer:
Popular (most common) Psammoma bodies
Palpable lymph nodes (spreads most commonly by lymphatics, seen in 33% of patients)
Positive 131I uptake
Positive prognosis
Postoperative 131I scan to diagnose/treat metastases
Pulmonary metastases

6.How can the differences between etiologies of ACUTE and SUBACUTE thyroiditis be remembered?

Alphabetically: A before S, B before V (i.e., Acute before Subacute and Bacterial before Viral, and thus: Acute⇒ Bacterial and Subacute⇒Viral) 22

7.What is the differential diagnosis of hypercalcemia?

"CHIMPANZEES":
Calcium overdose,
Hyperparathyroidism (1 /2 /3), Hyperthyroidism, Hypocalciuric Hypercalcemia (familial)
Immobility/Iatrogenic (thiazide diuretics)
Metastasis/Milk alkali syndrome (rare)
Paget's disease (bone)
Addison's disease/acromegaly
Neoplasm (colon, lung, breast, prostate, multiple myeloma)
Zollinger-Ellison syndrome,
Excessive vitamin D, vitamin A
Sarcoid

8.What is the initial medical treatment of hypercalcemia ?

Medical—IV fluids, furosemide—NOT thiazide diuretics

MCQs:

Q1: A 55-year-old woman presents with a slow-growing painless mass on the right side of the neck. A fine-needle aspiration of the nodule shows a well-differentiated papillary carcinoma. A complete neck ultrasound demonstrates a 1-cm nodule in the right thyroid without masses in the contralateral lobe or lymph node metastasis in the central and lateral neck compartments. With regards to this patient, which of the following is associated with a poor prognosis?
a. Age
b. Sex
c. Grade of tumor
d. Size of tumor
e. Lymph node status

Q2: A 63-year-old woman notices lumps on both sides of her neck. A fine-needle aspirate is nondiagnostic, and she undergoes total thyroidectomy. Final pathology reveals a 2-cm Hürthle cell carcinoma.[1] Which of the following is the most appropriate postsurgical management of this patient?
a. No further therapy is indicated.
b. Chemotherapy.
c. External beam radiotherapy.
d. Radioiodine ablation.
e. Chemotherapy, external beam radiotherapy, and radioiodine ablation.

Ans: 1:A, 2:D

[1] a variant of follicular carcinoma of the thyroid