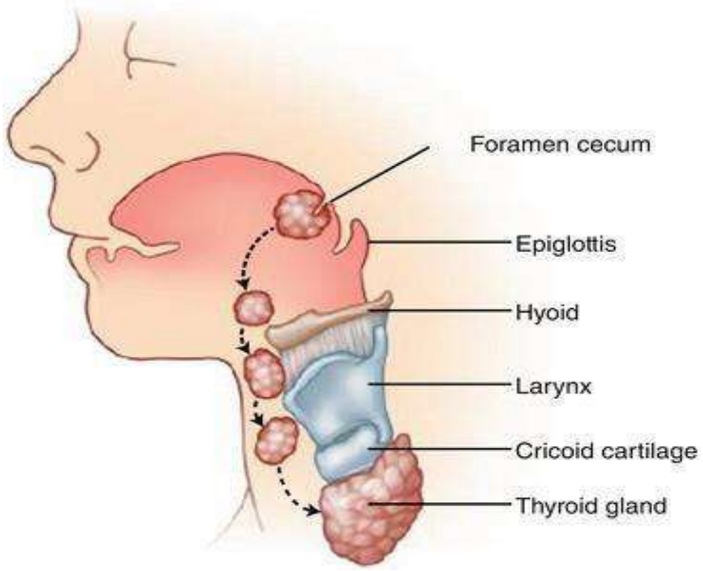
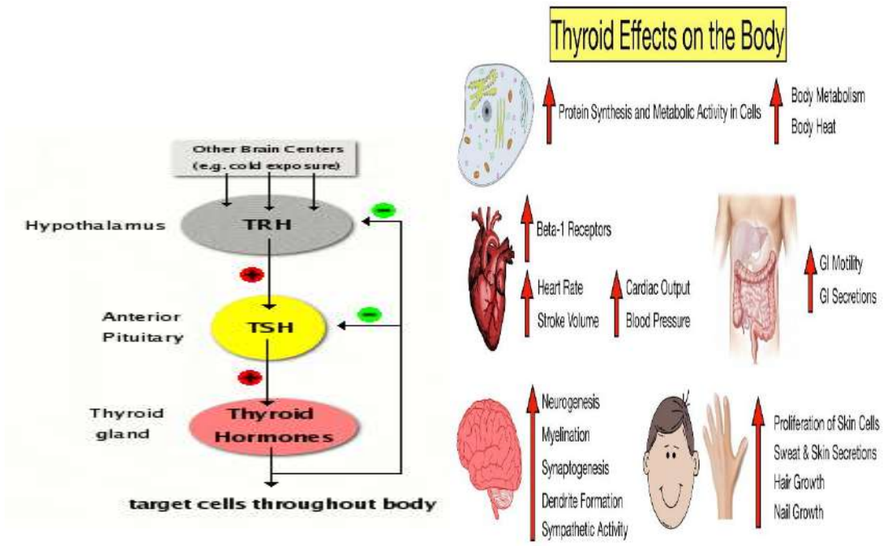
The THYROID GLAND





thyrotoxicosis

Thyrotoxicosis is **a condition in which you have too much thyroidhormone in your body**

What causes thyrotoxicosis?

1.Hyperthyroidism

2.Thyroid inflammation

3.Excess thyroid medication

✓ **The thyroid is a butterfly-shaped gland that lies inferior to the cricoid cartilage, approximately 4 cm belowthe superior notch of the thyroid cartilage .**

✓ **It is comprised of a central isthmus, covering the second to fourth tracheal rings, and two lateral lobes that are usually no larger than the distal phalanx of the patient's thumb.**

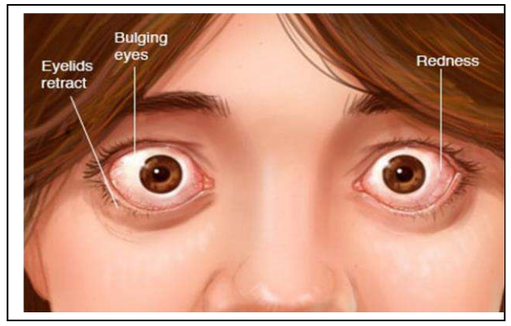
✓ **Rarely, it can be located higher in the neck along the line of the thyroglossal duct, an embryological remnant of the descent of the thyroid from base of the tongue to its final position.**

✓ **Thyroglossal cysts can also arise from the thyroglossal duct; they often occur at the level of the hyoid bone and characteristically move upwards on tongue protrusion. The thyroid is attached to the pretracheal fascia and thus moves superiorly on swallowing or neck extension.**

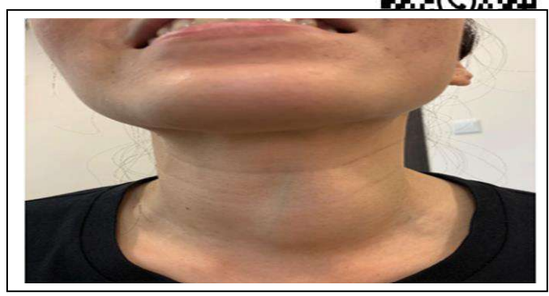
✓ **Thyrotoxicosis is a clinical state of increased metabolism caused by elevated circulating levels of thyroid hormones.**

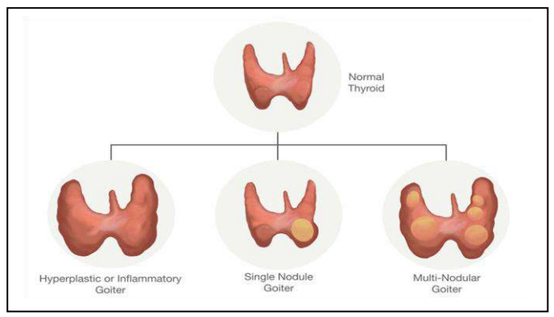
Graves' disease is the most common cause It is an **autoimmune disease** with a familial component and is **5–10 times more common in women**, usually presenting between 30 and 50 years of age.

Other causes include **toxic multinodular goitre, solitary toxic nodule, thyroiditis and excessive thyroid hormone ingestion.**



Thyroid nodules may be solitary or may present as a dominant nodule within a multinodular gland. Palpable nodules (usually > 2 cm in diameter) although up to 50% of patients have occult nodules; thus many are found incidentally on neck or chest imaging





✓ **Hypothyroidism** is caused by reduced levels of thyroid hormones, usually due **to autoimmune Hashimoto's thyroiditis**, and affects women approximately six times more commonly than men. Most other causes are iatrogenic and include previous radioiodine therapy **or surgery for Graves' disease.**

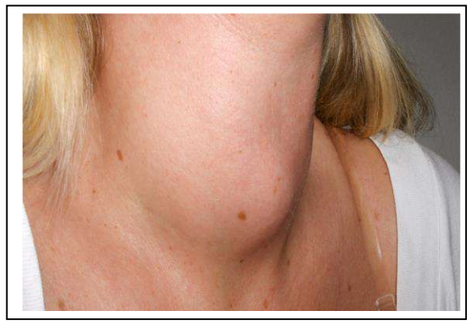
Neck pain

Neck pain is uncommon in thyroid disease and, if sudden in onset and associated with thyroid enlargement, may represent **bleeding into an existing thyroid nodule**. Pain can also occur **in viral subacute(de Quervain's) thyroiditis**

➔ Common presenting symptoms

Neck swelling

- **Goitre** **is enlargement of the thyroid gland** . It is not necessarily associated with thyroid dysfunction and **most patients with goitre are euthyroid**. Large or retrosternal goitres may cause compressive symptoms, including stridor, breathlessness or dysphagia.



Hyperthyroidism	Hypothyroidism
Weight Loss	Weight Gain
Increased Appetite	Decreased Appetite
Heat Intolerance Increased Sensitivity to Heat	Cold Intolerance Increased Sensitivity to Cold
Tachycardia, Palpitations, Arrhythmias	Bradycardia
Diarrhea	Constipation
Anxiety, Nervousness, Irritability, Insomnia, Tremors	Fatigue, Depression, Impaired Memory, Impaired Concentration, "Mental Fog"
Increased Hair and Nail Growth Increased Sweating	Hair Loss and Thin Nails Dry Skin

Proximal muscle weakness (diffculty rising from sitting or bathing)

oligomenorrhoea or amenorrhoea (infrequent or ceased menses, respectively)

eye symptoms: 'grittiness', excessive tearing, retro-orbital pain, eyelid swelling or erythema, blurred vision or diplopia (these symptoms of ophthalmopathy occur in the setting of gravies disease only).

- **recent pregnancy (postpartum thyroiditis usually occurs in** the frst 12 months)

drug therapy: antithyroid drugs or radioiodine therapy; amiodarone and lithium can cause thyroid dysfunction

- **family history of thyroid or other autoimmune disease**
- **residence in an area of iodine defciency, such as the Andes, Himalayas, Central Africa: can cause goitre and,rarely hypothyroidism**
- **smoking (increases the risk of Graves' ophthalmopathy).**

Past medical and drug social history

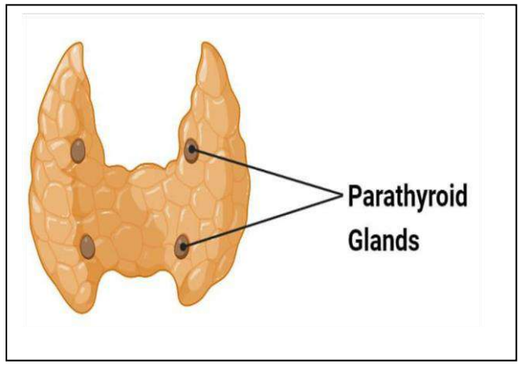
Ask about:

- **prior neck irradiation (risk factor for thyroid malignancy)**

The parathyroid

Anatomy and physiology

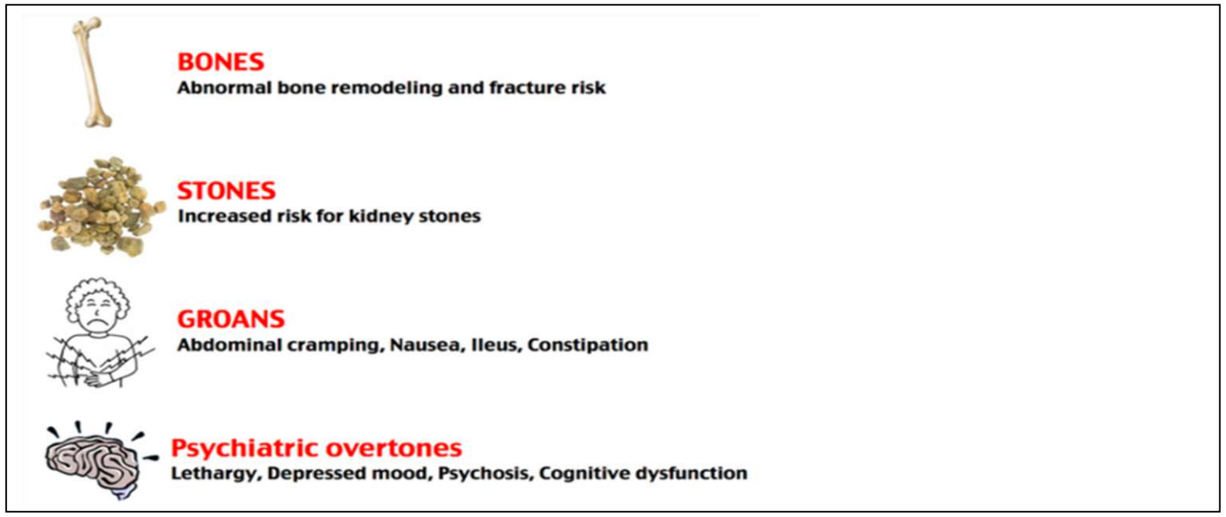
There are usually four parathyroid glands situated posterior tothe thyroid . Each is about the size of a pea and **produces parathyroid hormone, a peptide that increases circulating calcium level**



Common presenting symptoms

- **Parathyroid disease is commonly asymptomatic.**
- **In hyperparathyroidism the most common symptoms relate to hypercalcaemia:**

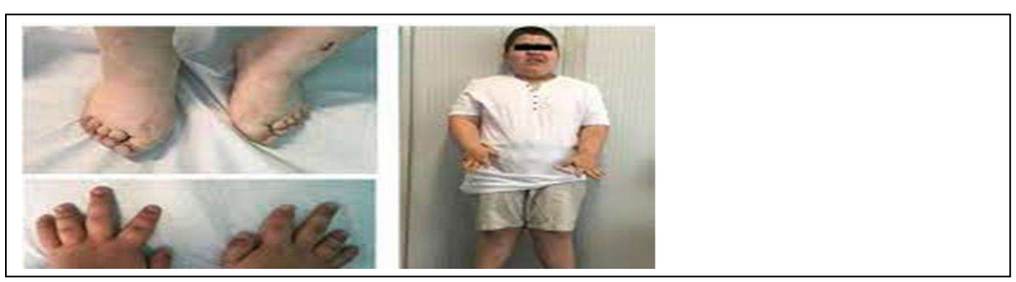
• polyuria, polydipsia, renal stones, peptic ulceration, tender areas of bone fracture or deformity ('Brown tumours) ,and delirium or psychiatric symptoms.



In hypoparathyroidism hypocalcaemia may cause hyper-reflexia or tetany (involuntary muscle contraction), most commonly in the hands or feet. Paraesthesiae of the hands and feet or around the mouth may occur.

Hypoparathyroidism is most often caused by inadvertent damage to the glands during thyroid surgery but may also be caused by autoimmune disease.

Patients with the rare autosomal dominant condition pseudohypoparathyroidism have end-organ resistance to parathyroid hormone and typically have short stature,a round face and shortening of the fourth and fifth metacarpal bones



Ask about

polyuria, polydipsia (hypercalcaemia)

abdominal pain or constipation (hypercalcaemia)

confusion or psychiatric symptoms (hypercalcaemia)

bone pain (hypercalcaemia)

muscle cramps, perioral or peripheral paraesthesia (hypocalcaemia)

Past medical, drug, family and social history

Ask about:

recent neck surgery or irradiation

past history of bone fractures

past history of renal stones

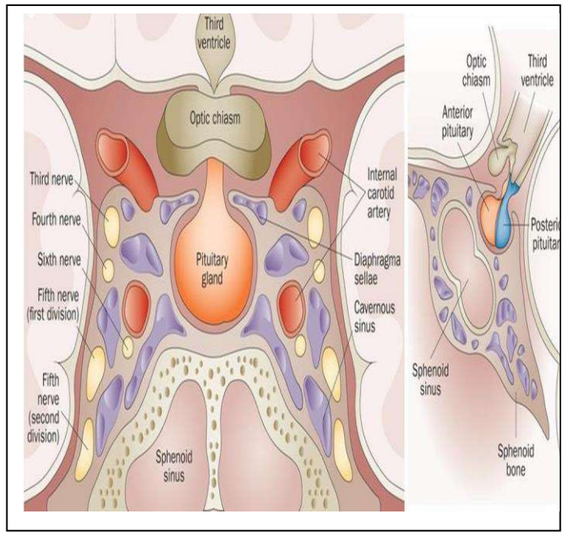
family history of autoimmune diseases (Addison's disease and type 1 diabetes can be associated with hypoparathyroidism)as part of the autosomal recessive type 1 autoimmune polyglandular syndrome)

THE PITUITARY

Anatomy and physiology

The pituitary gland is enclosed in the sella turcica at the base of the skull beneath the hypothalamus. It is bridged over by a fold of dura mater (diaphragma sellae)

Lateral to the pituitary fossa are the cavernous sinuses, containing cranial nerves III, IV and VI and the internal carotid arteries.



The gland comprises anterior and posterior lobes.

The anterior lobe secretes adrenocorticotrophic hormone (ACTH), prolactin, growth hormone (GH), thyroid-stimulating hormone (TSH) and gonadotrophins (luteinising hormone (LH) and follicle-stimulating hormone (FSH)).

The posterior lobe is an extension of the hypothalamus, and secretes vasopressin(antidiuretic hormone) and oxytocin.

Common presenting symptoms

- Hypopituitarism can result from a space-occupying lesion or from a destructive or infltrafive process such as trauma, radiotherapy, sarcoidosis, tuberculosis or metastatic disease.

  Pituitary infarction or haemorrhage can result in acute hypopituitarism (referred to as pituitary apoplexy)and is a medical emergency; it is often associated with headache, vomiting, visual impairment and altered consciousness.

Hypopituitarism	
Etiology	**Pituitary causes** • Mass lesions (primary or metastatic) • Infiltration (eg, lymphocytic hypophysitis) • Hemorrhage (pituitary apoplexy) • Ischemic infarction (Sheehan syndrome) **Hypothalamic lesions** (eg, sarcoidosis, infection, radiation therapy)
Clinical presentation	**ACTH deficiency** • Hypotension, weight loss, hypoglycemia **Hypothyroidism** • Fatigue, cold intolerance, slowed deep-tendon reflexes **Gonadotropins** • Women: Amenorrhea, infertility • Men: Infertility, loss of libido

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- **Pituitary tumours**

  Pituitary adenomas are common and are found incidentally in around10% of patients undergoing head computed tomography (CT) or magnetic resonance imaging (MRI).

  Non-functioning pituitary adenomas may be asymptomatic or may present with local effects, such as compression of the optic chiasm causing visual loss (typically bitemporal upper quadrantanopia or hemianopia; or headache due to expansion of the sella.

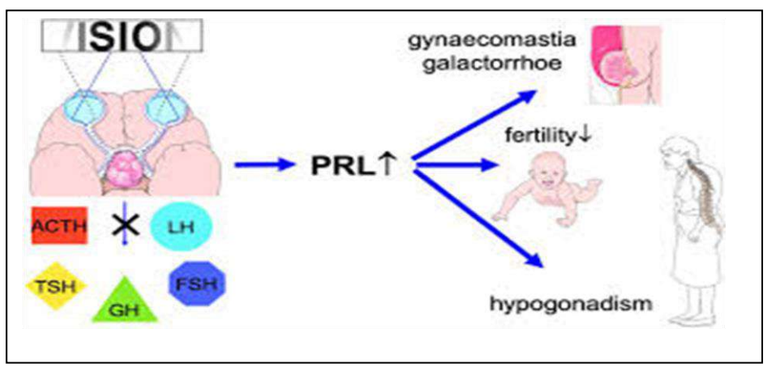
- Adenomas may produce hormones such as prolactin, GH or ACTH; the resulting symptoms and signs will depend on the excess hormone present

Prolactinoma

Ask about:

galactorrhoea (breast milk secretion)

oligomenorrhoea, amenorrhoea or infertility (in women) reduced libido, erectile dysfunction and reduced shaving frequency (in men)



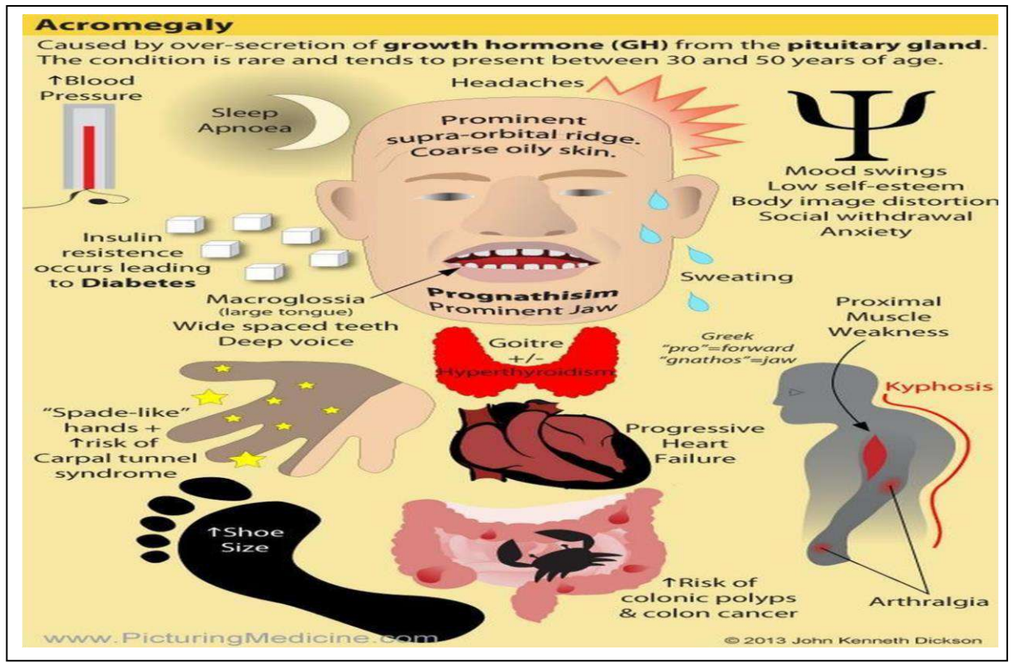
Acromegaly

- GH excess prior to puberty presents as gigantism; after puberty,it causes acromegaly.

Ask about:

- headache
- excessive sweating
- changes in facial features (ask to see old photographs)
- an increase in shoe, ring or glove size

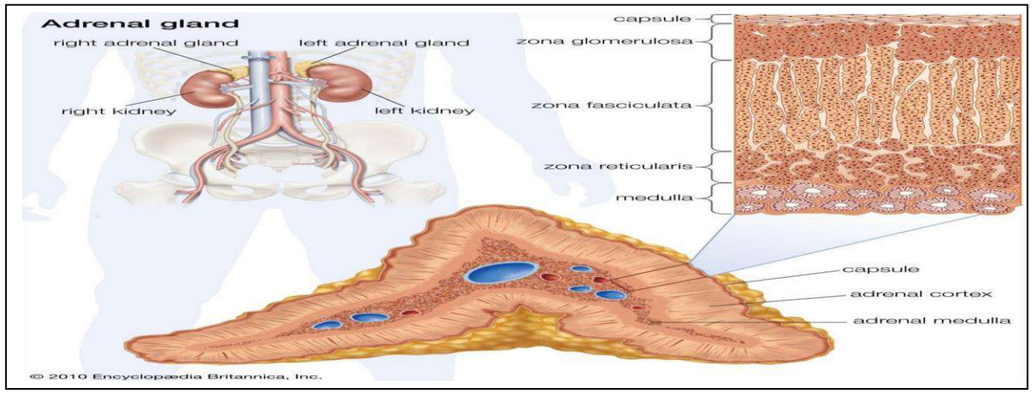
associated medical conditions: arthropathy, carpal tunnelsyndrome, hypertension, diabetes, colonic malignancy, sleep apnoea



THE ADRENALS

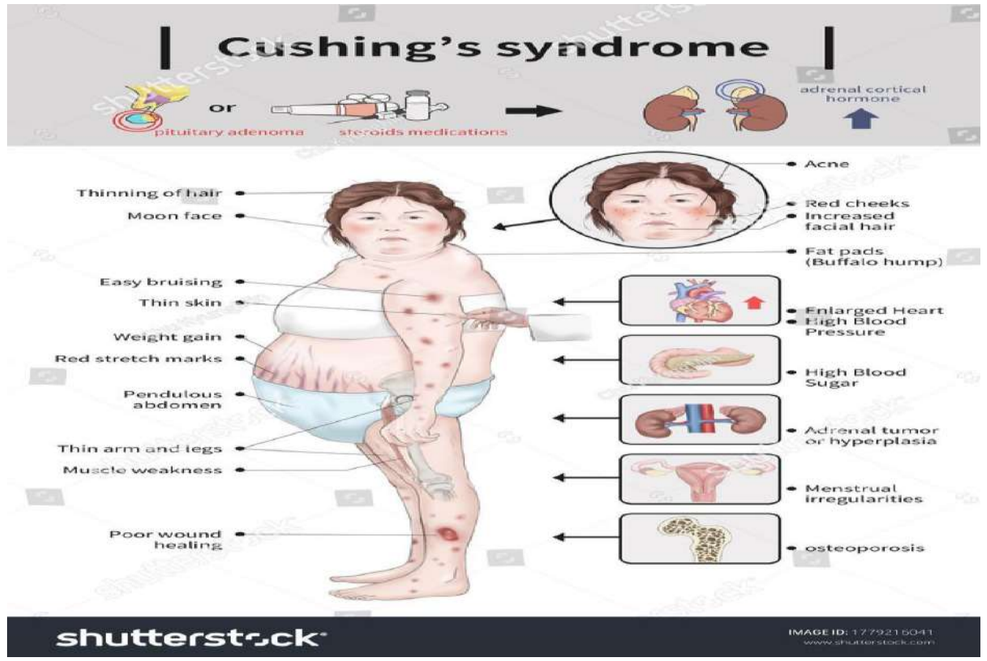
Anatomy and physiology

- **The adrenals are small, pyramidal organs lying immediately above the kidneys on their posteromedial surface. The adrenal medulla is part of the sympathetic nervous system and secretes catecholamines. The adrenal cortex secretes cortisol (a glucocorticoid), mineralocorticoids and androgens.**



Common presenting symptoms

- **Cushing's syndrome is caused by excess exogenous or endogenous glucocorticoid .**
- **Most cases are iatro-genic and caused by side effects of glucocorticoid therapy.**
  'Endogenous' Cushing's usually results from an ACTH-secreting pituitary microadenoma, but other causes include a primary adrenal tumour or 'ectopic' ACTH secretion by a tumour.



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Features of Cushing syndrome	
Clinical manifestations	• **Central obesity** (eg, fat accumulation in the cheeks & dorsocervical & supraclavicular fat pads) • Skin atrophy & wide, purplish **striae** • Proximal muscle weakness • Hypertension • **Glucose intolerance** • Skin hyperpigmentation (if ACTH excess)
Diagnosis	• 24-hour urinary cortisol excretion • Late-night salivary cortisol assay • Low-dose dexamethasone suppression test

Ask about:

1. **increase in weight, particularly if the weight is centrally** distributed
2. **bruising, violaceous striae and skin thinning**
3. **diffculty rising from a chair/bath (may indicate proximalmyopathy**

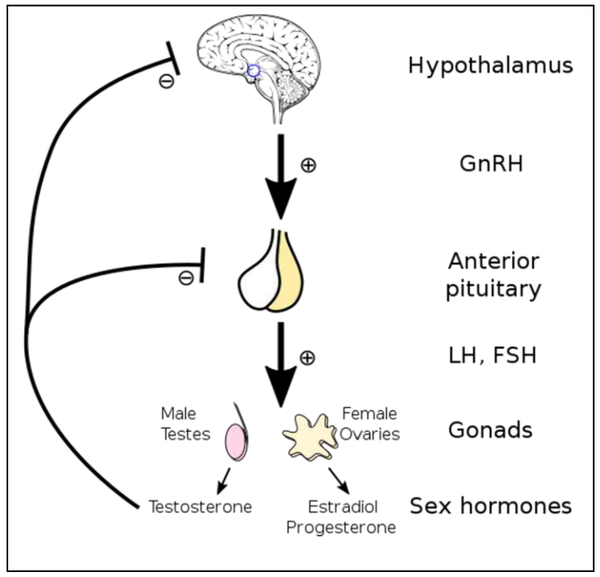
Addison's disease is due to inadequate secretion of cortisol, usually secondary to autoimmune destruction of the adrenal cortex. Symptoms are usually non-specifc

Ask about:

- ❖ **weakness**
- ❖ **postural lightheadedness**
- ❖ **nausea, vomiting, diarrhoea, constipation, abdominal painand weight loss**
- ❖ **muscle cramps**.

THE GONADS

Anatomy and physiology



- **The gonads (testes and ovaries) secrete sex hormones (testosterone and oestrogen) in response to gonadotrophin(FSH and LH) release by the pituitary**

Common presenting symptoms

- •Hypogonadism can be primary (failure of the gonad itself) or secondary (where reduced gonadotrophin levels cause gonadalfailure).
- Klinefelter's syndrome (47XXY) is the most common cause of primary hypogonadism in men (1:600 live male births;
- Secondary hypogonadism may be caused by pituitary disease, extremes of weight, or drugs that suppress hypothalamic gonadotrophin releasing hormone release (such as anabolic steroids or opiates).
- Presenting symptoms in men include loss of libido, erectile dysfunction, loss of secondary sexual hair,reduction in testicular size and gynaecomastia .
- Hyperandrogenism in women usually presents with hirsutism(excessive male-pattern hair growth; , acne and/or oligomenorrhoea, and is commonly due to polycystic ovariansyndrome (PCOS; usually also associated with obesity).
  Other less common causes should be considered (such as congenital adrenal hyperplasia).
- Virilisation is suggested by male-pattern baldness, deepening of the voice, increased muscle bulk and clitoromegaly; if present in women with a shorthistory of severe hirsutism, consider a testosterone-secreting tumour

DIABETES

Anatomy and physiology

The pancreas lies behind the stomach on the posterior abdominal wall. Its endocrine functions include production of insulin (from betacells), glucagon, gastrin and somatostatin. Its exocrine function is to produce alkaline secretions containing digestive enzymes.

Diabetes mellitus is characterised by hyperglycaemia causedby absolute or relative insulin defciency.

Diabetes may be primary or secondary. Primary diabetes isdivided into:

type 1: severe insulin defciency due to autoimmune destruction of the pancreatic islets. These patients are susceptible to acute decompensation due to hypoglycaemia or ketoacidosis, both of which require prompt treatment.

type 2: commonly affects people who are obese and insulin-resistant, although impaired beta-cell function isalso important. These patients may decompensate by developing a hyperosmolar hyperglycaemic state.

Common presenting symptoms

- Diabetes mellitus commonly presents with a classical triad of symptoms:
- polyuria (and nocturia): due to osmotic diuresis caused by glycosuria

  thirst: due to the resulting loss of fluid

- weight loss: due to fluid depletion and breakdown of fat and muscle secondary to insulin defciency.

Other common symptoms are tiredness, mood changes and blurred vision (due to glucose-induced changes in lens refraction).

Bacterial and fungal skin infections are common because of the combination of hyperglycaemia, impaired immune resistance and tissue ischaemia. Itching of the genitalia (pruritus vulvae in

women, balanitis in men) is due to *Candida* yeast infection (thrush).

Past medical, drug, family andsocial history

Ask about:

- Previous glucose intolerance or gestational diabetes, which are risk factors for progression to type 2 diabetes.
- other autoimmune conditions such as thyroid disease (increased incidence of type 1 diabetes).

Drug therapy: glucocorticoids can cause steroid-induceddiabetes.

Family history of diabetes or autoimmune disease.
Monogenic diabetes is usually inherited in an autosomal dominant manner. Patients are often slim (unlike those with type 2 diabetes) but do

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- Alcohol: raises the possibility of pancreatic diabetes

. Monogenic diabetes should be

considered in people presenting with diabetes under the ageof 30 who have an affected parent or a family history of early-onset diabetes in around 50% of frst-degree relatives.