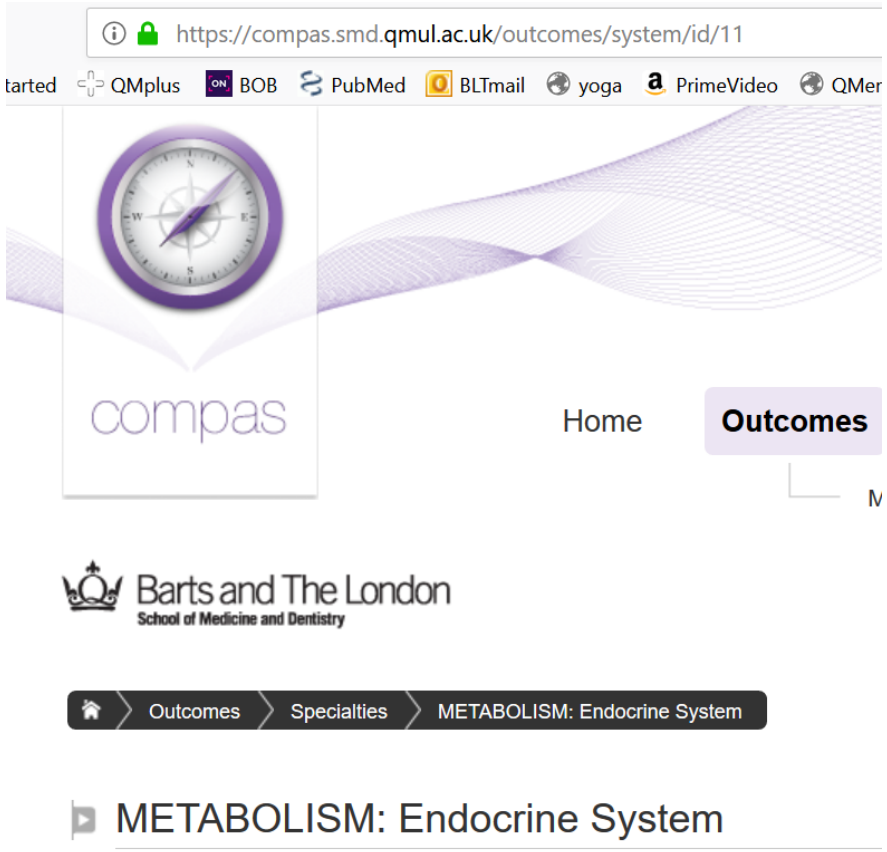
Endocrinology for Finals

Maralyn Druce

Professor of Endocrine Medicine

Barts and the London School of Medicine

‘Fair Game’ - Endocrine Topics



- Endocrine Emergencies
- Thyroid Disease
- Adrenal Disease
  - Endocrine hypertension
- Pituitary Disease
  - Acromegaly
  - Sodium imbalance
- Parathyroid Disease

The difference between endocrinology and other specialties in finals

So ask yourself….

- What is this question asking me to recognise?
- What is this question asking me to demonstrate that I know?
- What is this question asking me to show that I can do?

- Remember though – real life isn’t always like finals and this can be a good thing or a bad thing!

Endocrine Emergencies

- Pass / Fail but….

- 1) actually helps first to know and understand the physiology and non emergency management
- 2) excellent lecture slides online from Cathy Gouveia

http://www.simplyrevision.org.uk/uploads/5/2/7/4/5274529/diabetes_and_endocrinology_.pdf

Therefore we won't focus on these but will weave some signposts into the cases

Case 1

- A 34 year old lady comes to see you. She complains of a change in bowel habit. You elicit a history of 2 stone weight loss but no PR bleeding
- On direct questioning you ask directly about anxiety, sleep, fidgeting, sweating, palpitation and periods

- What other questions would you like to ask the patient?

What is this history asking you to show?

- Weight loss has a wide differential diagnosis but should include….

Other possible stems might include:

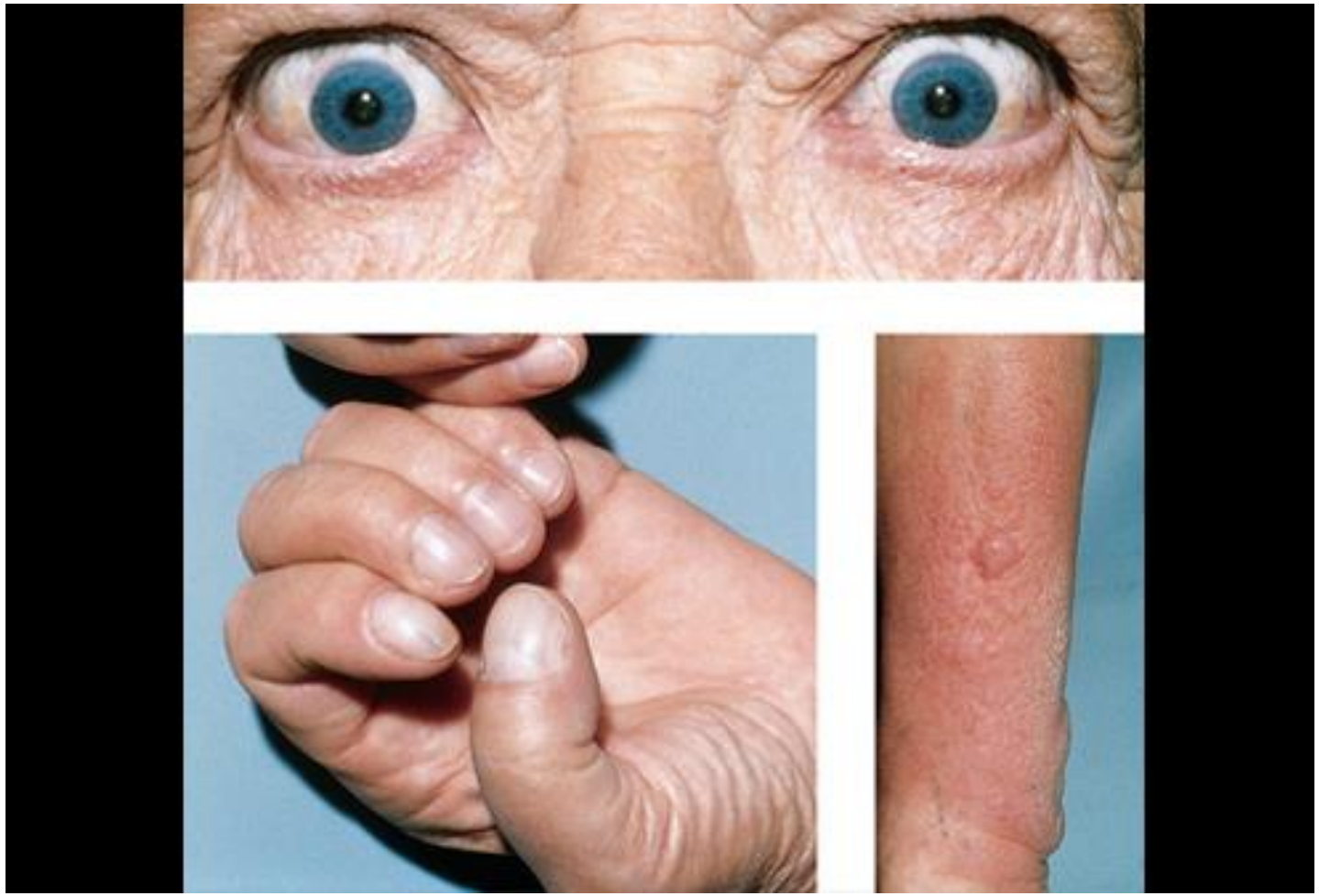
- This patient has noticed a change in her appearance / that her eyes look different or feel gritty or sore
- Eye problems have a wide differential diagnosis but should include….
- and you therefore also think about questions that demonstrate thyroid status

- This patient presented with a lump in the neck
- Neck lumps have a wide differential diagnosis but should include….
- and you therefore also think about questions that demonstrate thyroid status

	Hypothyroid	Hyperthyroid
High suspicion	Goitre Delayed reflexes	Goitre Thyroid bruit (secondary to increased blood flow) Lid lag Proptosis (bulging eyes)
Intermediate suspicion	Fatigue Weight gain/difficulty losing weight Cold intolerance Dry, rough, pale skin Constipation Facial swelling (oedema) Hoarseness	Fatigue Weight loss Heat intolerance/sweating Fine tremor Increased bowel movements Fast heart rate/palpitations Staring gaze
Low / non specific	Coarse, dry hair Hair loss Muscle cramps/muscle aches Depression Irritability Memory loss Abnormal menstrual cycles/menorrhagia Decreased libido	Nervousness Insomnia Breathlessness Light or absent menstrual periods Muscle weakness Warm moist skin Hair loss

Symptoms and signs of thyroid dysfunction

On examination you find…..



If you see a patient like this they will need

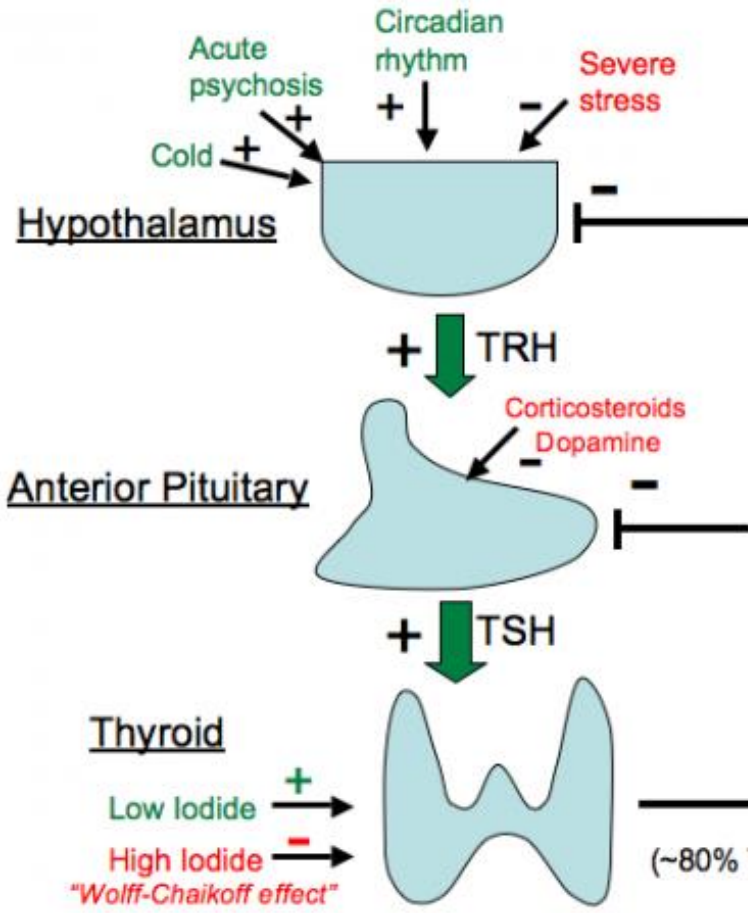
- A full thyroid status examination
- A full thyroid gland examination

Thyroid Examination

http://wn.com/Thyroid_Gland_Status_Assessment_And_Examination__SGHMS#/videos

http://www.osceskills.com/e-learning/subjects/thyroid-examination/

What investigations would you like to perform and how will you interpret them?



First investigations

- TSH < 0.02 (range 0.3 – 4.2)
- Free T4 32.6 pmol/l (range 9.0-25.5)

Anything else you would like to know on investigation?

What is the differential diagnosis?

What next?

- Total T3 6.7 nmol/l (range 2.5-5.7 pmol/l)
- TPO antibodies raised at 700
- TSH receptor antibodies raised

- Discuss the biochemistry; what is the diagnosis?
- Do you need any imaging?

- What do you do next?
- What are the treatment options? What aspects will need to be considered in treatment choices?

Treating thyrotoxicosis

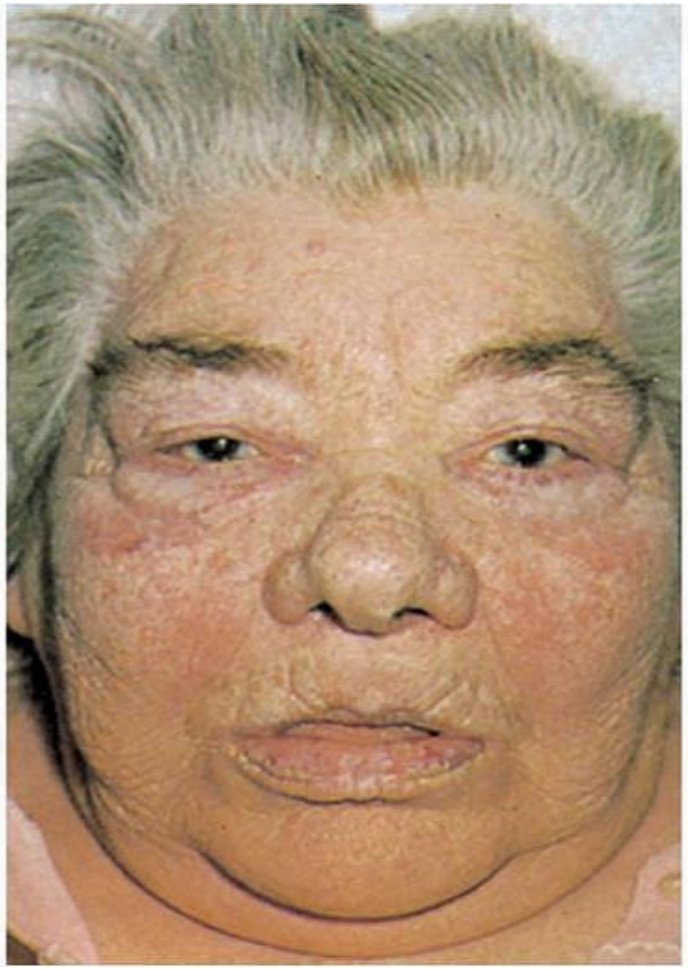
- Non emergency

- Emergency / ‘Thyroid storm’
- (see Dr Gouveia slides 51-64)

Case 2

- A 59 year old lady comes to see you. She feels tired all the time and seems to be gradually gaining weight.
- On direct questioning you ask directly about her hair and skin, her energy levels, sense of mental ‘sharpness’ and her bowel habit.
- What other questions would you like to ask the patient?
- What is going through your mind?
- What features do you try and elicit on examination?
- What do these tell you?

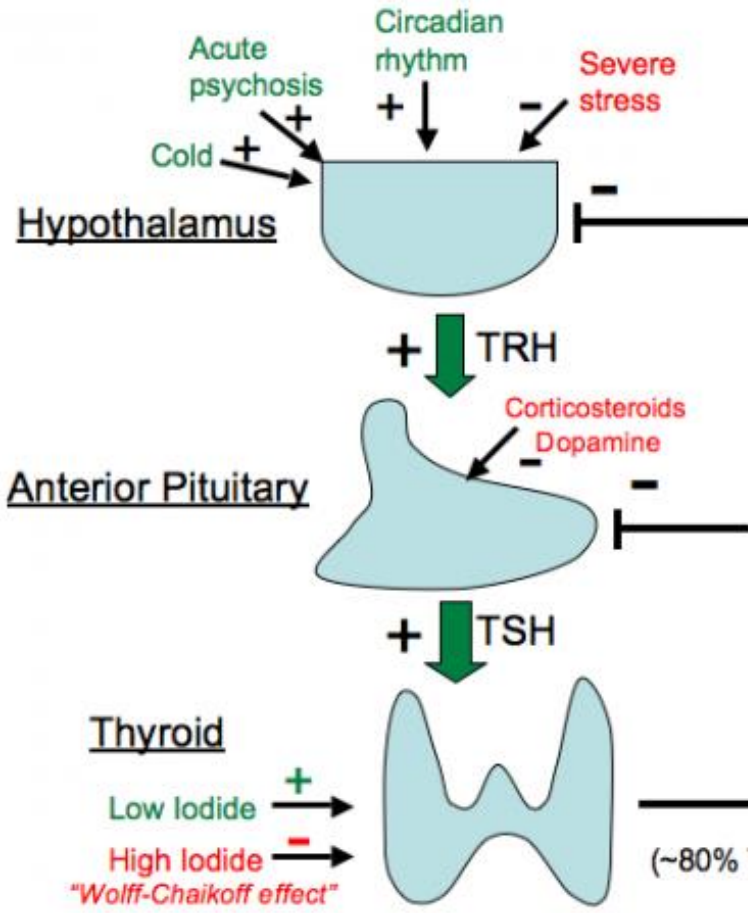
On examination you find…..



If you see a patient like this they will need

- A full thyroid status examination
- A full thyroid gland examination

What investigations would you like to perform and how will you interpret them?



First investigations

- TSH 15 (range 0.3 – 4.2)
- Free T4 8.8 pmol/l (range 9.0-25.5)

Anything else you would like to know on investigation?

- TPO antibodies raised at 700
- Other autoantibodies (liver/kidney/microsomal; GPA etc negative)

What next?

- Discuss the blood test results
- Do you need any imaging?

- What do you do next?
- What is the differential diagnosis?
- What should the treatment be? What aspects will need to be considered in treatment?
- What do you need to take particular care about?
- In the emergency setting ‘myxoedema coma’ – Dr Gouveia lecture slide 41-52

A note on: The patient with a neck swelling

- History
- Examination of swelling
- If it seems to be of thyroid origin – what is the clinical thyroid STATUS?

Differential Diagnosis includes:

- Smooth goitre
- Multinodular goitre
- Dominant Nodule in a nodular goitre
- Single thyroid nodule – benign or malignant
- Thyroid other abnormality (eg thyroglossal cyst)
- Non-thyroid swelling

Assessment

- Details of history (location, duration, change, pain etc)
- Risk factors for thyroid cancer including radiation exposure, family history, genetic predisposition (and state if none)
- Impact on
  - swallowing
  - breathing
  - cosmesis
- Assessment of thyroid status
- Examination for nature and impact of the swelling (include effect on voice, presence of stridor = urgent referral)
- Thyroid function tests BEFORE DECIDING WHAT TO DO NEXT

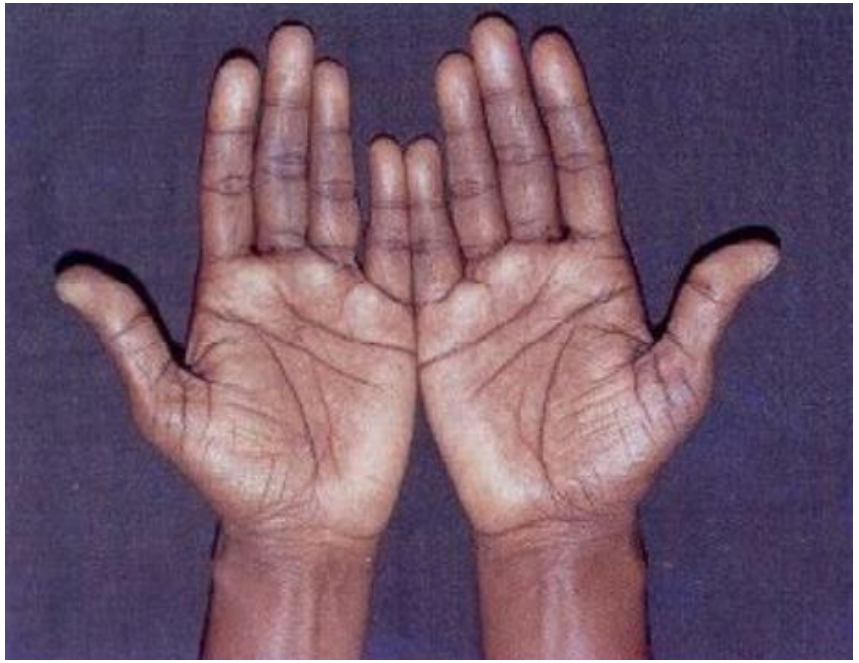
Case 3

- A 19-year old student was admitted to A and E after a 24 hour illness with abdominal pain and vomiting
- He had no fever, no history of foreign travel and no infective contacts
- He had a history of significant fatigue over the past 5 months, with anorexia, weight loss and feeling faint on standing
- He had a family history of hypothyroidism in an aunt and her mother was taking vitamin B12 injections

What is this history asking you to show?

- Vague and general histories have a wide differential diagnosis but may point towards a possible diagnosis that you could not afford to miss – can you recognise the pattern?
- Are there clues in the history that you must tune your radar into?
- Are there clues that you will need to pick up on in the examination and investigations that you must notice?

On examination you find…..



If you see a patient like this they will need

- A full physical examination
- Search for concurrent autoimmune disease
- Understanding of what blood test abnormalities to expect

What investigations would you like to perform and how will you interpret them?

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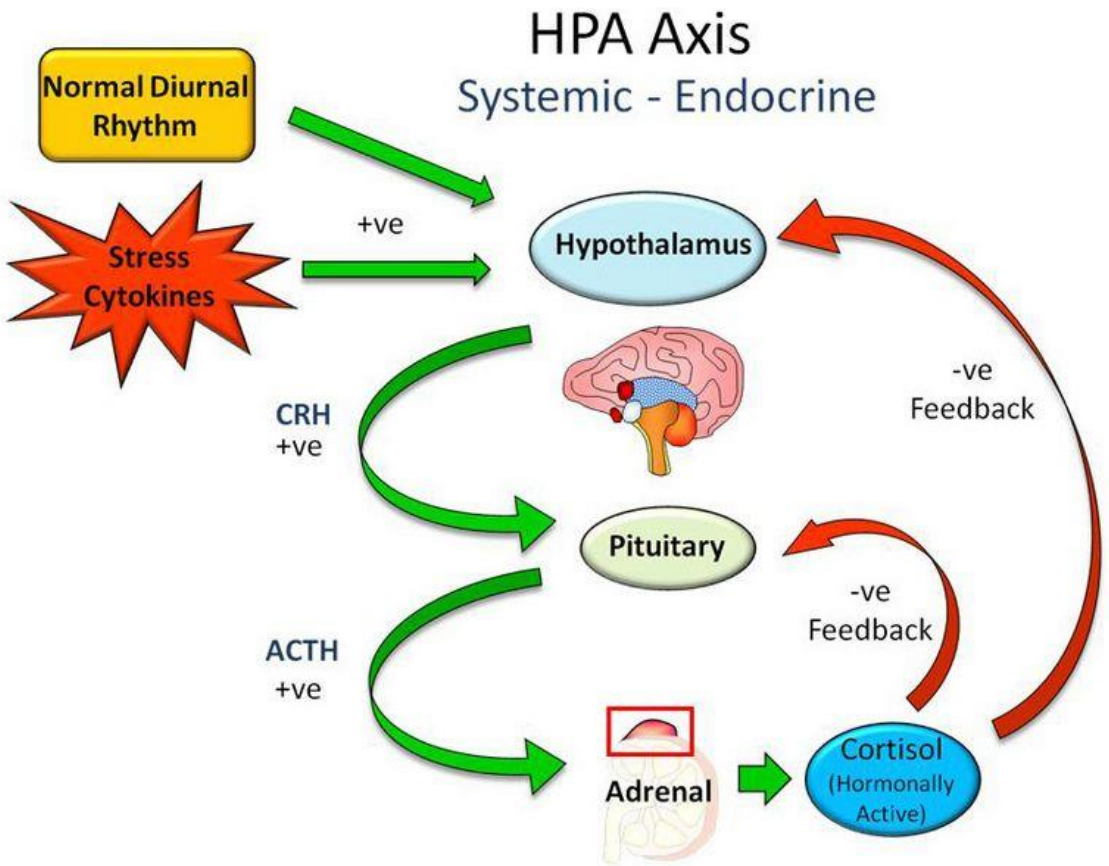
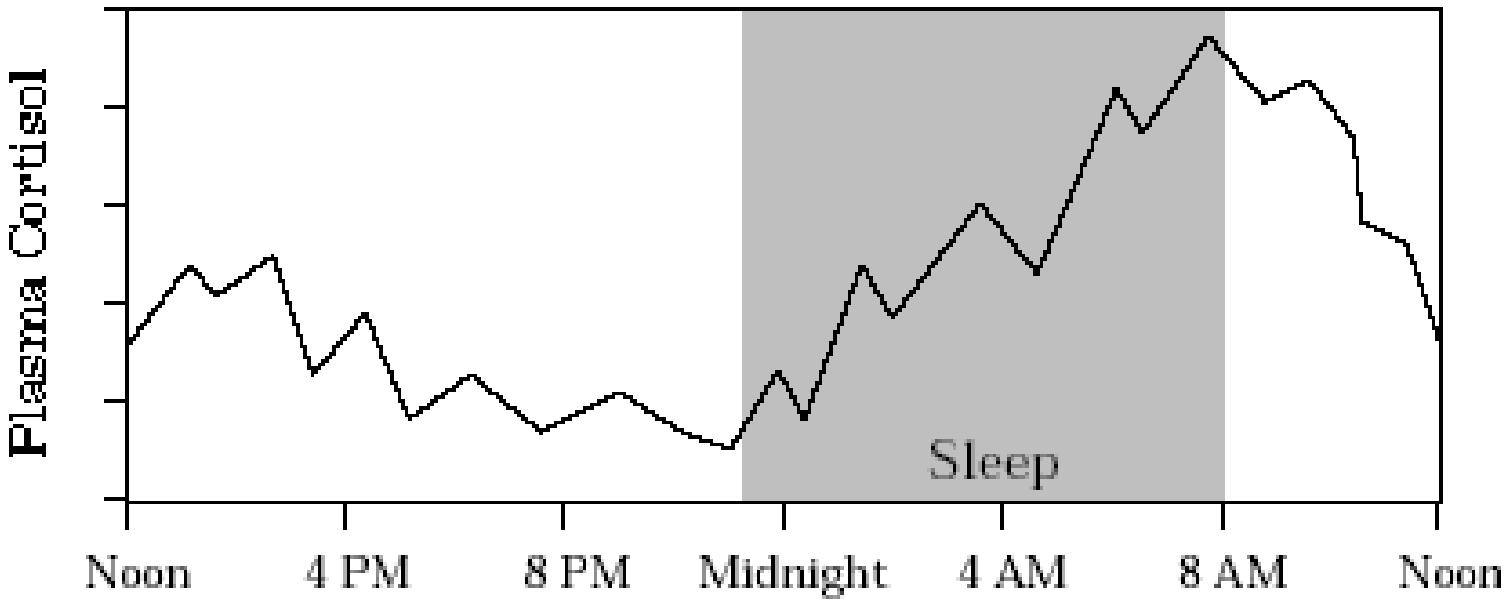


What investigations would you like to perform and how will you interpret them?

- Na 130 mmol/L (range 135-146)
- K 5.8 mmol/L (range 3.5 – 5.1)
- Urea 12 mmol/L (range 3-7)
- Glucose 2.9 mmol/L (range 3.5 – 6.1)

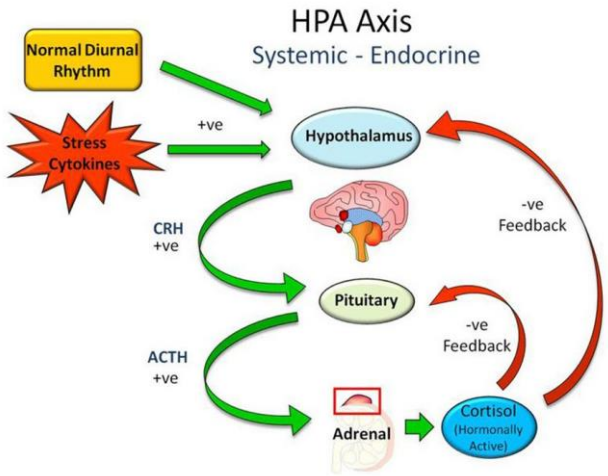
- Likely diagnosis?
- How to make a definitive diagnosis?

Diurnal variation in cortisol:
Basal measurement at what time?
What to do if the cortisol level if indeterminate?



Causes of adrenal insufficiency

- Tertiary or due to exogenous steroid
- Secondary (low ACTH – not this patient)
- Primary (high ACTH)

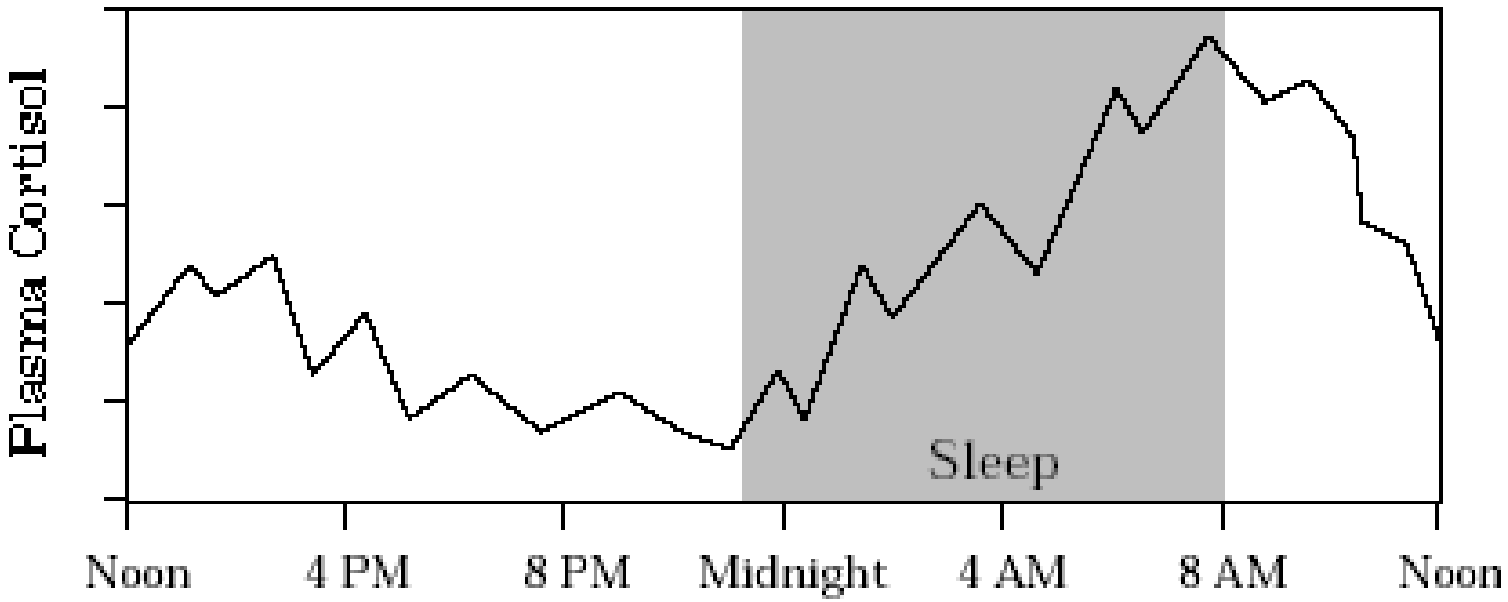


Treatment of adrenal insufficiency

- Treatment of Addison's disease involves replacing, or substituting, the hormones that the adrenal glands are not making.
- Cortisol is replaced orally with hydrocortisone tablets, a synthetic glucocorticoid, taken two or three times a day.
- If aldosterone is also deficient, it is replaced with oral doses of a mineralocorticoid called fludrocortisone acetate, which is taken once a day.
- Patients receiving aldosterone replacement therapy are usually advised by a doctor to increase their salt intake. Because patients with secondary adrenal insufficiency normally maintain aldosterone production, they do not require aldosterone replacement therapy.

Diurnal variation in cortisol:

Implications for hydrocortisone dosing



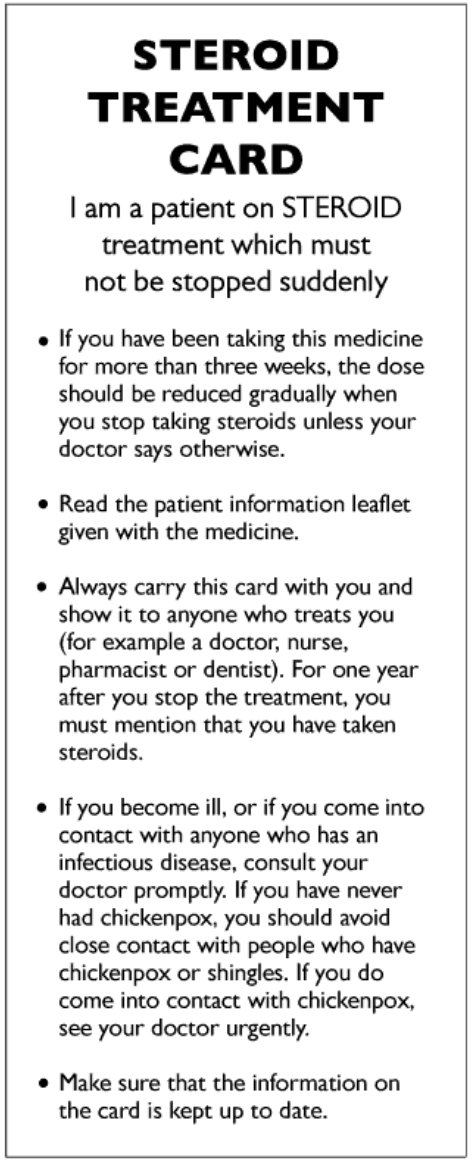
Steroid Preparations

Steroid	Half-life (mins)	Glucocorticoid relative potency	Mineralocorticoid relative potency
Hydrocortisone	90	1.0	1.0
Cortisone acetate	30	0.8	0.8
Prednisolone	230	4.0	0.8
Prednisone	60	3.5-4.0	0.5
Dexamethasone	280	25.0-30.0	0.0

Precautions for patients:
The ‘sick-day’ rules

- Steroid card
- Medic-alert bracelet
- Never miss a dose
- Doubling of steroid dose for febrile illness
- Intramuscular emergency injection
- Admission for parenteral steroids if vomiting, diarrhoea, severe intercurrent illness

Steroid card



STEROID TREATMENT CARD

I am a patient on STEROID treatment which must not be stopped suddenly

- If you have been taking this medicine for more than three weeks, the dose should be reduced gradually when you stop taking steroids unless your doctor says otherwise.
- Read the patient information leaflet given with the medicine.
- Always carry this card with you and show it to anyone who treats you (for example a doctor, nurse, pharmacist or dentist). For one year after you stop the treatment, you must mention that you have taken steroids.
- If you become ill, or if you come into contact with anyone who has an infectious disease, consult your doctor promptly. If you have never had chickenpox, you should avoid close contact with people who have chickenpox or shingles. If you do come into contact with chickenpox, see your doctor urgently.
- Make sure that the information on the card is kept up to date.

Emergency treatment of adrenal insufficiency

- Recognition of the problem
- LIFE-THREATENING EMERGENCY
- Intravenous fluids (N/Saline; may need several litres)
- Intramuscular hydrocortisone (100 mg im qds initially)
- Glucose supplementation if needed
- Seek and treat underlying precipitant

Management of the patient undergoing surgery / illness

- Moderate elective investigations / procedures
  - 100mg HC prior to procedure
- Major surgery
  - 100mg HC with premed
  - 100mg HC QDS for first 24-48 hours
  - Reducing to lower IM/PO then normal maintenance dose
- Severe illness eg pneumonia
  - 100mg QDS until resolution of the illness

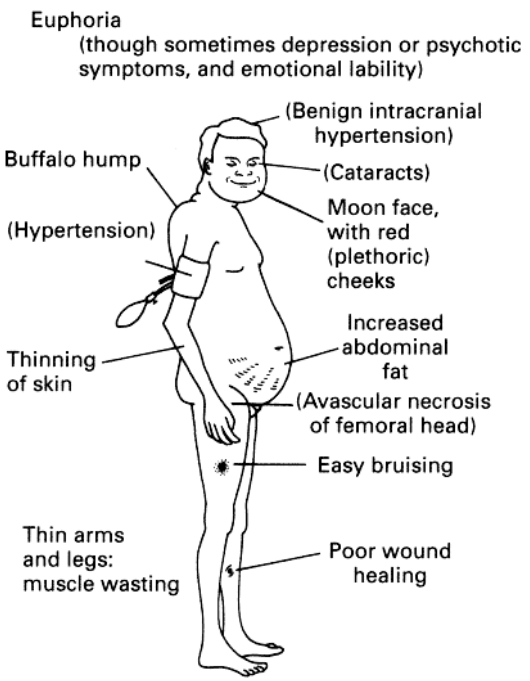
Case 4

- A 38 year old woman presented to the clinic with amenorrhoea, weight gain of 10 kg in the preceding year, hirsutism and hypertension. She had recently been diagnosed with type 2 diabetes mellitus.
- Examination findings included bp of 170/100, centripetal obesity with proximal myopathy, thinning of the skin and significant bruising and livid cutaneous striae

What is this history asking you to show?

- You recognise a pattern here and would know what other symptoms and signs to try and elicit on further evaluation
- You know what the diagnosis is
- You can construct a differential diagnosis
- You can make a stab at a plan for preliminary evaluation

Clinical Features



Also:

Osteoporosis
Tendency to hyperglycaemia
Negative nitrogen balance
Increased appetite
Increased susceptibility to infection
Obesity

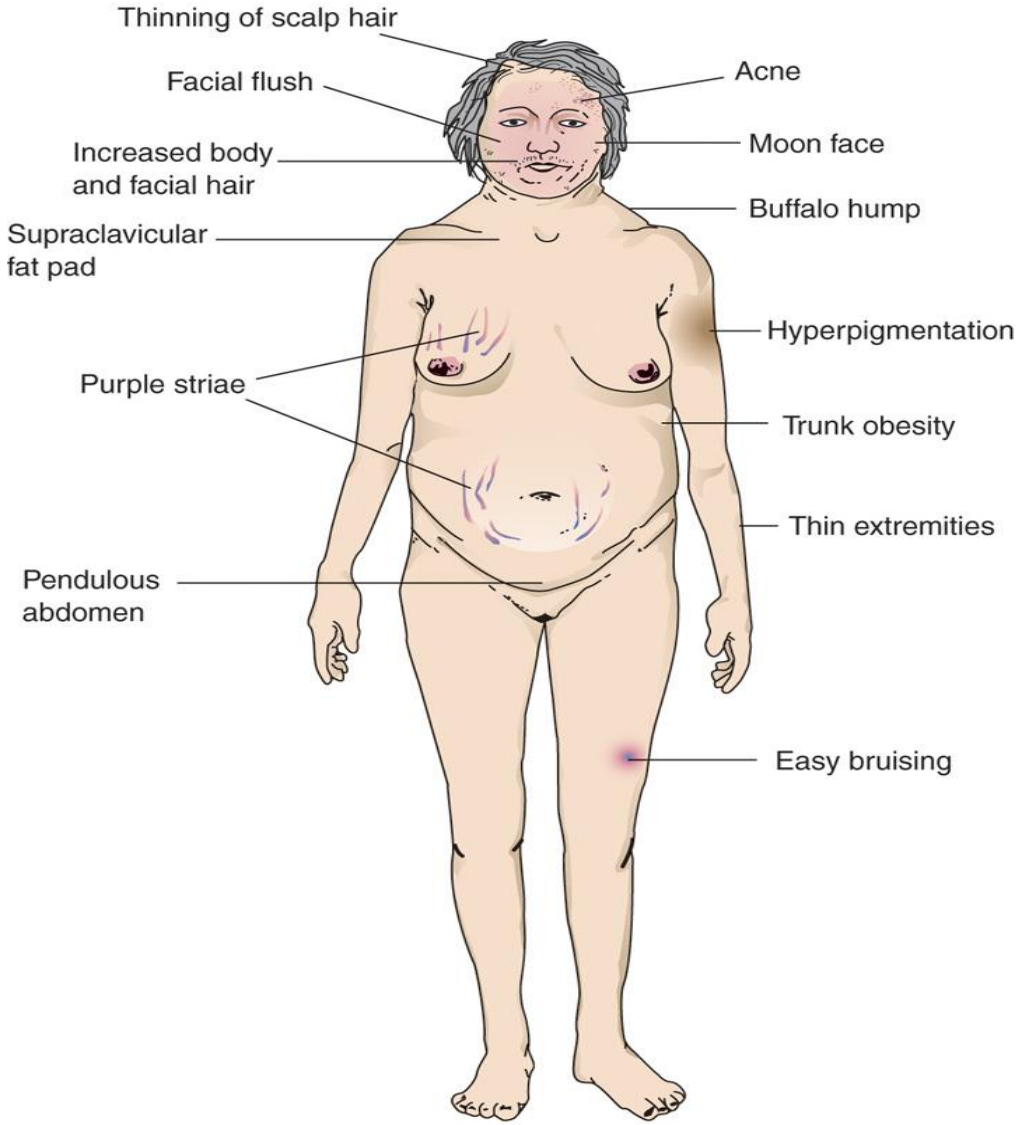
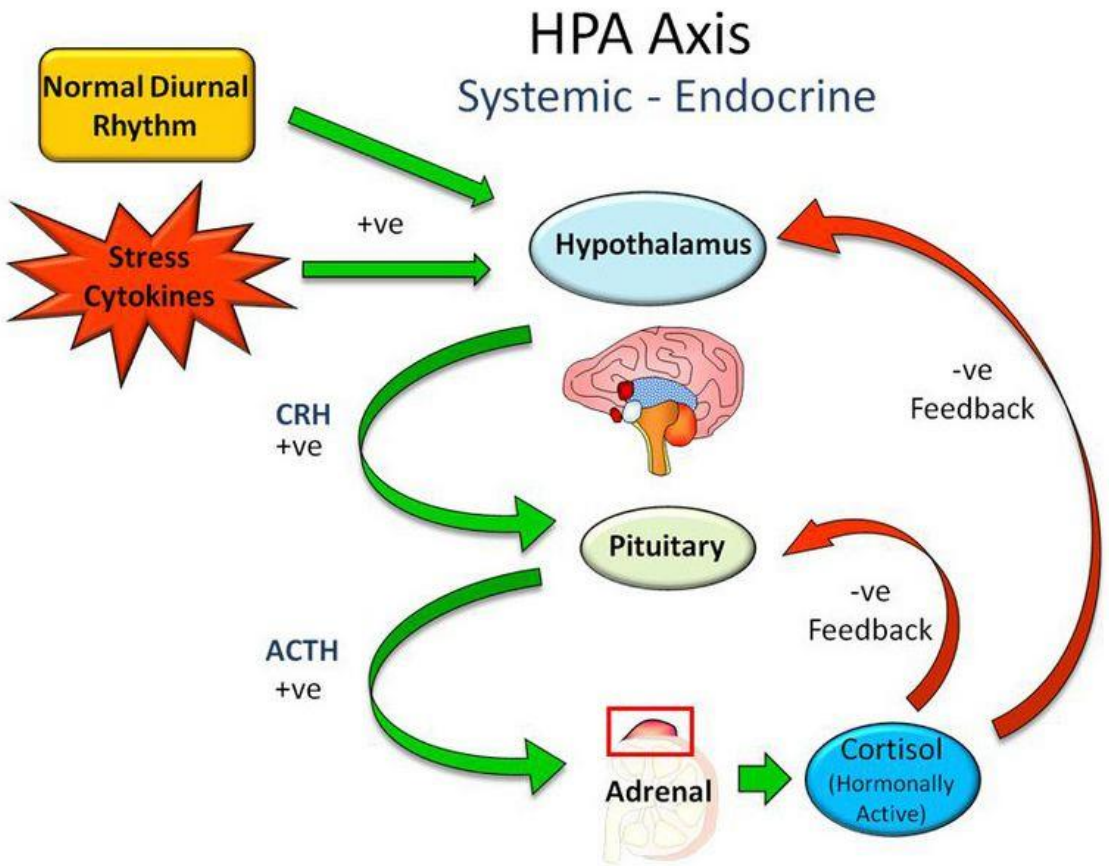


Figure 43-6 Clinical manifestations of Cushing's syndrome. (Source: Smeltzer SC, Bare BG: Brunner & Suddarth's Textbook of Medical-Surgical Nursing [9th Ed], p 1061. Philadelphia, Lippincott Williams & Wilkins, 2000.)

What is the diagnosis?
What is the differential diagnosis?



How will you further sort out your investigations?

- 1) ensure that there is no iatrogenic source for steroid excess
- 2) confirm sequelae of steroid excess (high white cell count, elevated glucose, low potassium, poor bone mineralisation etc)
- 3) demonstrate that there is indeed biochemical steroid excess – how would you go about doing this?
- 4) determine whether the steroid excess is driven by ACTH (ACTH-dependent) or whether it is ACTH-independent
- 5) once you are clear about whether ACTH dependent or not how would you localise the source further?

Case 5

- A 45 year old taxi driver was referred to the endocrine clinic by his dentist. He had complained of jaw pain and the dentist noticed a marked overbite and wide interdental spacing.
- When asked in more detail he thought that his appearance had changed since his 20’s with a greater prominence of his chin and more bulging of his forehead as well as a broadening of his nose. His wedding ring no longer fit him and he was complaining of increased sweating

What is this history asking you to show?

- You recognise a pattern here and would know what other symptoms and signs to try and elicit on further evaluation
- You know what the diagnosis might be
- You know what other features would be important to look for based on the likely underlying diagnosis (for example checking visual fields and checking for signs of pituitary hypofunction as well as GH excess)
- You can make a stab at a plan for preliminary evaluation

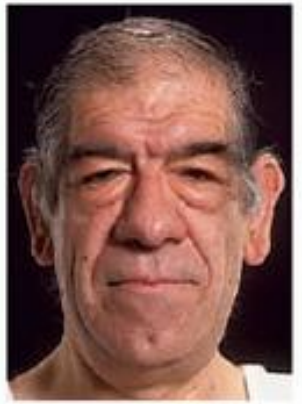
What else would you look for?

How would you investigate further?

Symptoms

Change in appearance
Increased size of hands/feet
Headaches
Excessive sweating
Visual deterioration
Tiredness
Weight gain
Amenorrhoea oligomenorrhoea in women
Galactorrhoea
Impotence or poor libido
Deep voice
Goitre
Breathlessness
Pain/tingling in hands
Polyuria/polydipsia
Muscular weakness
Joint pains

Old photographs are frequently useful
Symptoms of hypopituitarism may also be present



Signs

Prominent supraorbital ridge
Prognathism
Interdental separation
Large tongue
Hirsutism
Thick greasy skin
Spade-like hands and feet
Tight rings
Carpal tunnel syndrome
Visual field defects
Galactorrhoea
Hypertension
Oedema
Heart failure
Arthropathy
Proximal myopathy
Glycosuria (plus possible signs of hypopituitarism)

What investigations do you need to understand?

- Growth hormone (random)
- IGF1
- Suppression test as you suspect this is a syndrome of excess (glucose tolerance to suppress GH)
- Underlying cause likely pituitary adenoma therefore imaging after biochemistry

Case 6

- A 49 year old teacher presented with thirst, polyuria, dehydration and confusion
- She had abdominal pain but did not have an acute abdomen
- There was no history of kidney stones and no family history of kidney stones
- There was no history of bony pains or minimal-trauma bone fractures
- On examination she was dehydrated with a postural drop in blood pressure of 20mmg Hg.

What is this history asking you to show?

- This potentially non-specific history has a wide differential diagnosis but should include….

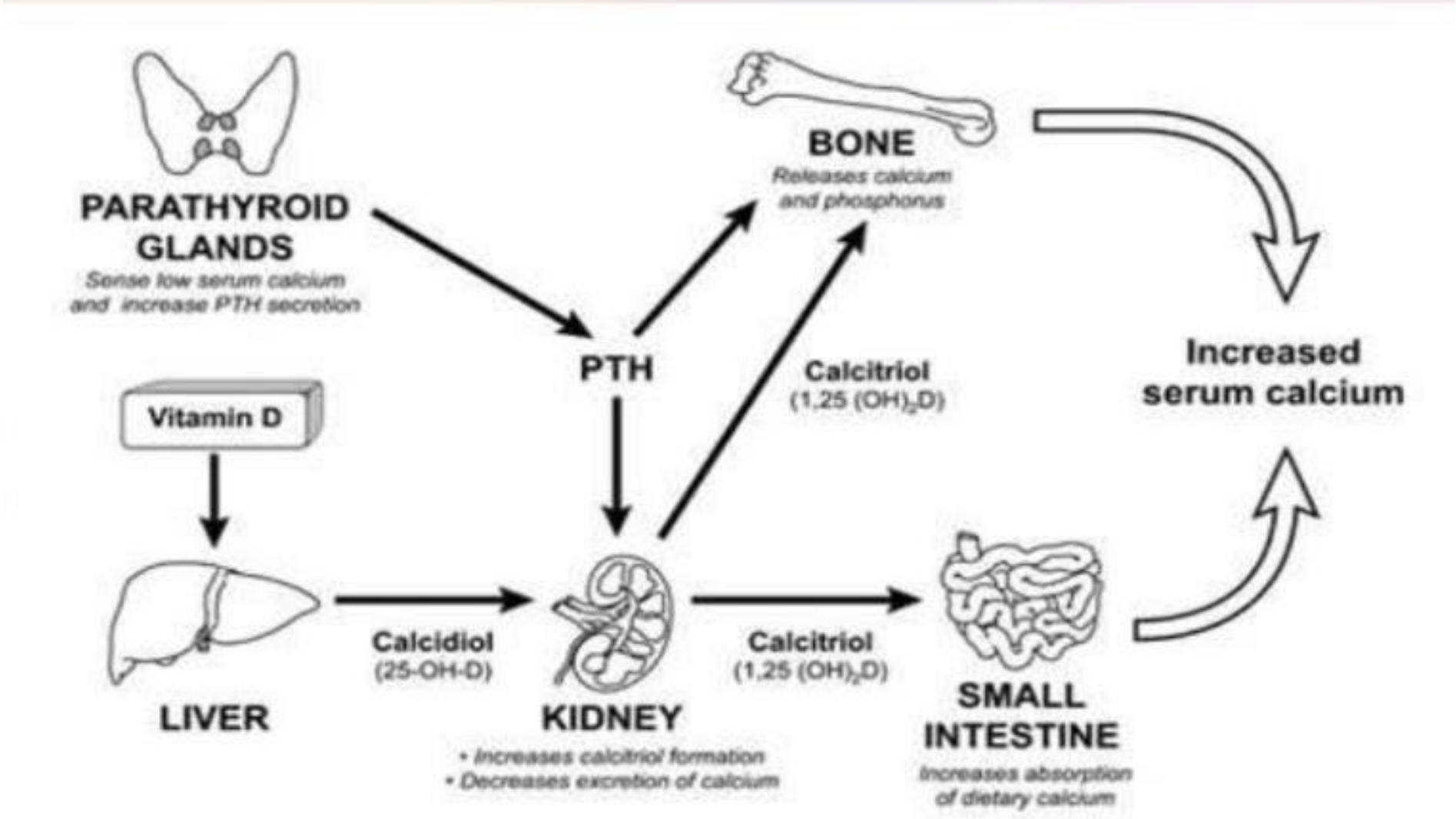
- You know what one possible diagnosis might be
- You know what other features would be important to look
- You can make a stab at a plan for preliminary evaluation in order to work out the differential diagnosis
- You would know how to treat the emergency aspects of this condition

Investigation findings

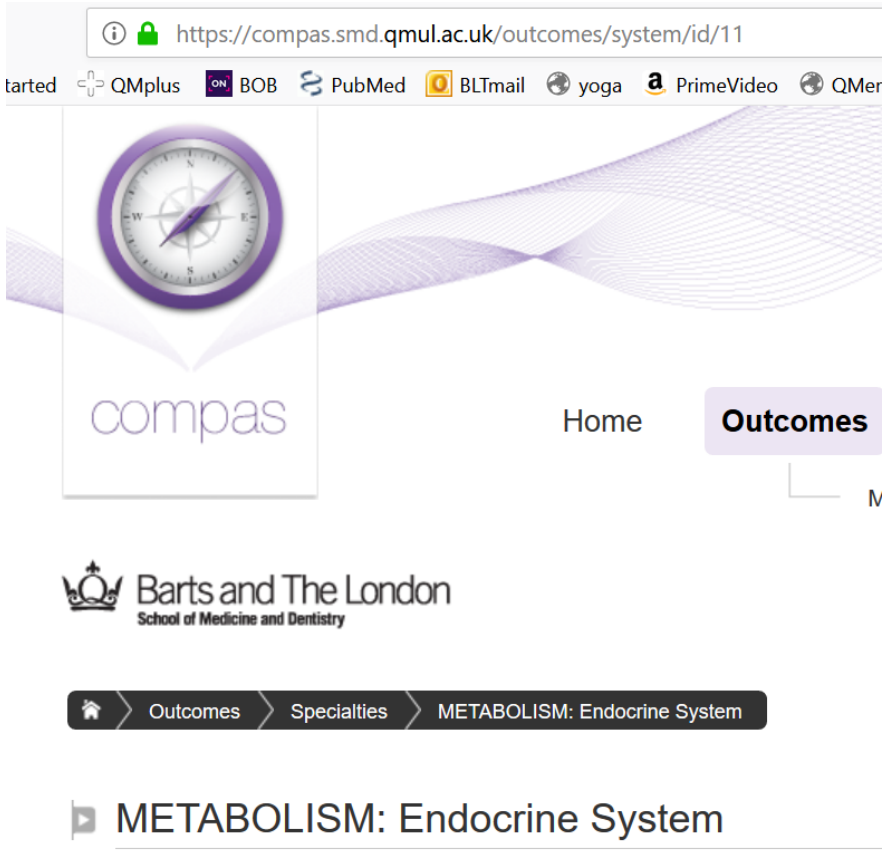
- Corrected calcium 3.02 mol/l
- Phosphate 1.0 mmol/l

- What other information do you need?
- How will it help you with your differential diagnosis?

What must you understand to take things forward?



‘Fair Game’ - Endocrine Topics - Summary



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Good Luck!