

Clinical cases in Endocrinology

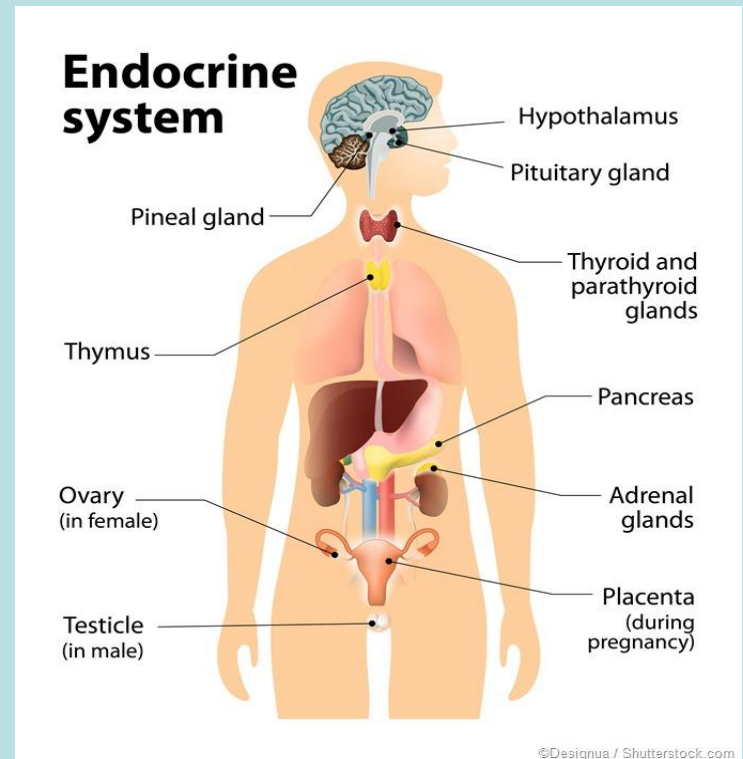
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Topics covered

- Thyroid dysfunction
- Hypogonadism
- Hypoadrenalism
- PCOS
- DM/Prediabetes
- Hyperparathyroidism
- Osteoporosis



68 year old female with hypothyroidism

- Reviewed in clinic
- On thyroxine 125 mcg per day
- Weight 82 Kg

- TFT
 - TSH 13.1 (0.38 - 5.5),
 - fT4 14.6 (10 -18.7)

- What would you do?
- Check compliance.
- Increase dose to 150 mcg.
- Review in 2-3 months.

- TSH 9.76 mU/l, FT4 16.1
- What else to check in the history?
- DH:
 - A. Thyroxine 150 mcg
 - B. Simvastatin
 - C. Ferrous sulphate
 - D. Frusmide
 - E. Amlodipine
- Advice patient to take iron tablets at least 2 hrs after her thyroxine (preferably 4 hrs).
- Repeat TSH 2 months later 0.89, fT4 17.8

Agents causing Interference with Levothyroxine absorption

- Bile acid sequestrants (cholestyramine, colestipol, colesevelam)
- Sucralfate
- Cation exchange resins (Kayexelate)
- **Oral bisphosphonates**
- **Proton pump inhibitors**
- Raloxifene
- Multivitamins (containing ferrous sulfate or calcium carbonate)
- **Ferrous sulfate**
- Phosphate binders (sevelamer, aluminum hydroxide)
- **Calcium salts** (carbonate, citrate, acetate)
- Chromium picolinate
- Charcoal

- Orlistat
- Ciprofloxacin
- H₂ receptor antagonists

Malabsorption syndromes

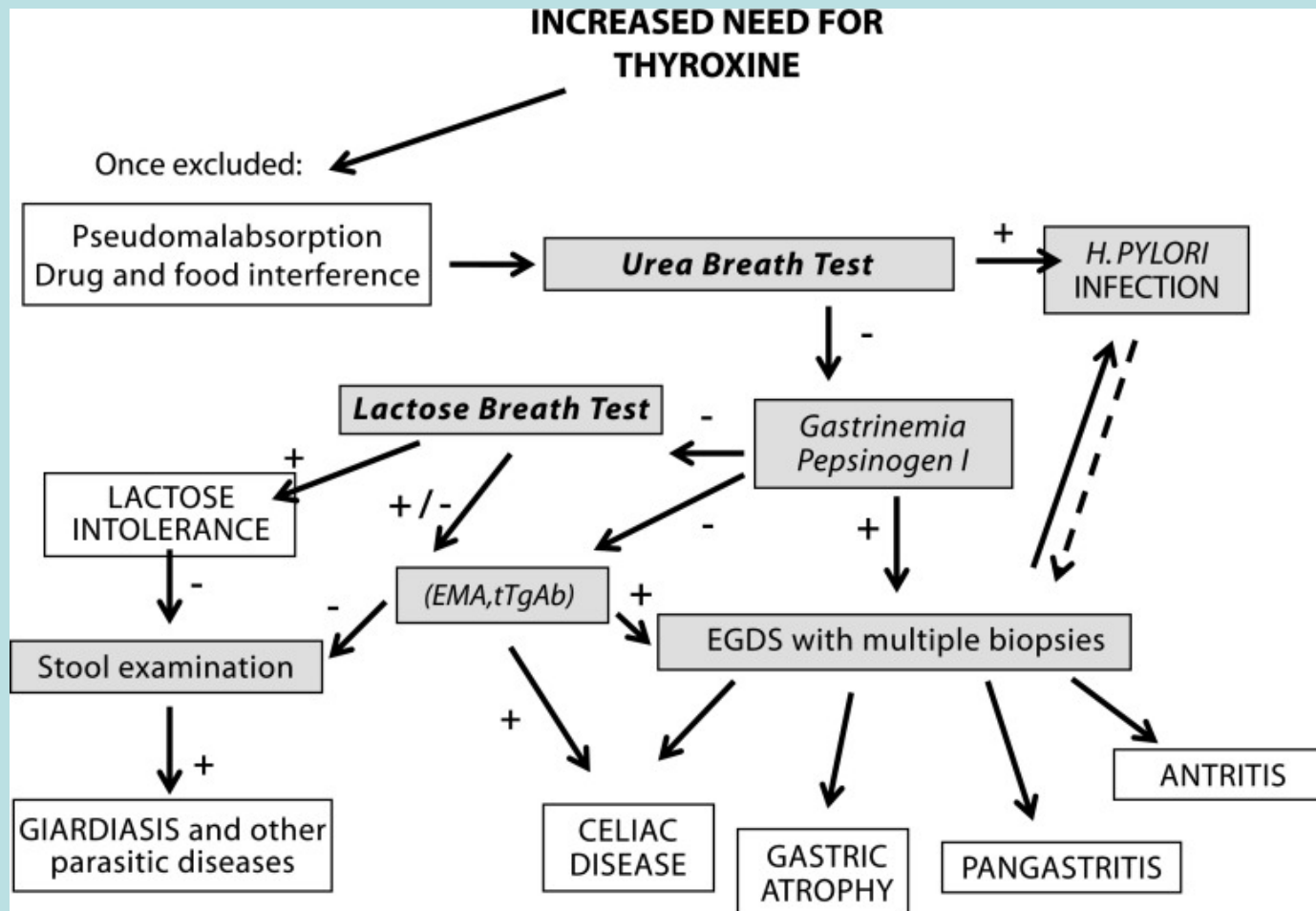
- Celiac disease
- Jejunioileal bypass surgery
- Cirrhosis (biliary)
- Achlorhydria

Diet

- **Ingestion with a meal**
- Grapefruit juice
- Espresso coffee
- High fiber diet
- Soybean

Diagnostic flow chart of thyroxine malabsorption.

J Endocrinol Invest. 2017; 40(12): 1289–1301.



26 year old female

- Reviewed in clinic.
- Grave's disease on carbimazole for 2 months.
- Complaining of sore mouth (ulcers) but otherwise well.
- What blood tests would you order?
- FBC
 - WCC 1.4 (3.7-10)
 - Neut 0.0 (1.7-6.6)
 - Hb 13.5 PLT 259
- TFT TSH 6.11, fT4 8.7

- Patient admitted, CBZ stopped and put on granulocyte colony-stimulating factor (GCSF) and intravenous empirical broad-spectrum antibiotics
- 6 days later
 - WCC 8.4
 - Neut 5.8

- The incidence has been reported about 0.35% (30,000 patients on antithyroid drugs).
- Mortality rate 5% - 21.5%.
- Immune-mediated (antibodies) destruction of mature neutrophils.
- **What next for her Hyperthyroidism?**
 - A. Propylthiouracil
 - B. Radioactive iodine.
 - C. Thyroidectomy.

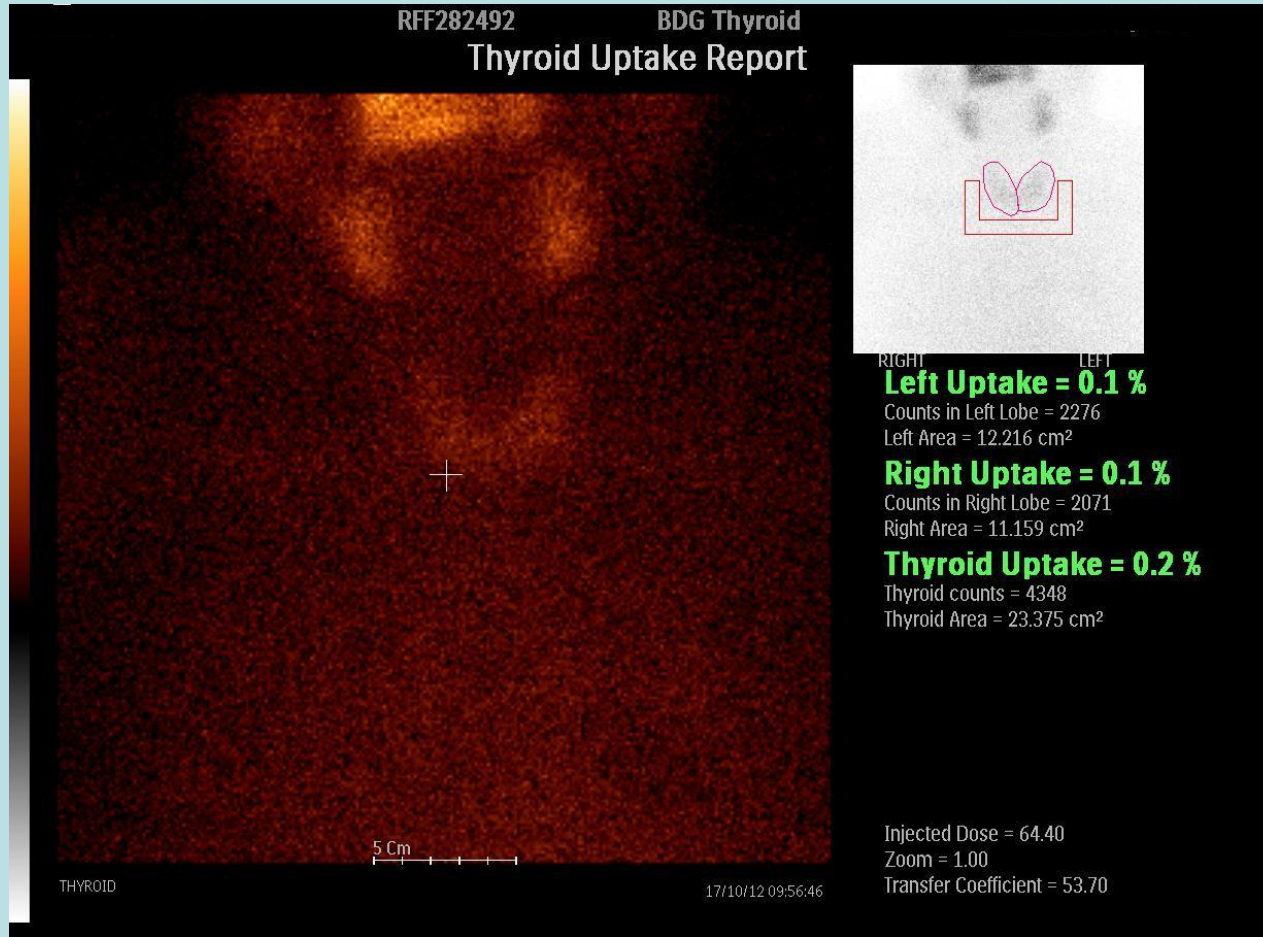
78 yr old man

- Presented with palpitations, AF.
- TFT checked
- TSH <0.01 , fT4 33.8
- Patient commenced on Carbimazole and referred to Endocrine clinic.

- 1 week later WCC from 4.2 to 3.5 (3.7-10)
- Neutrophil from 2.1 to 1.4 (1.7-6.6)

- CBZ stopped and referred for RAI
- fT4 35.2, TSH < 0.01

What is the diagnosis?

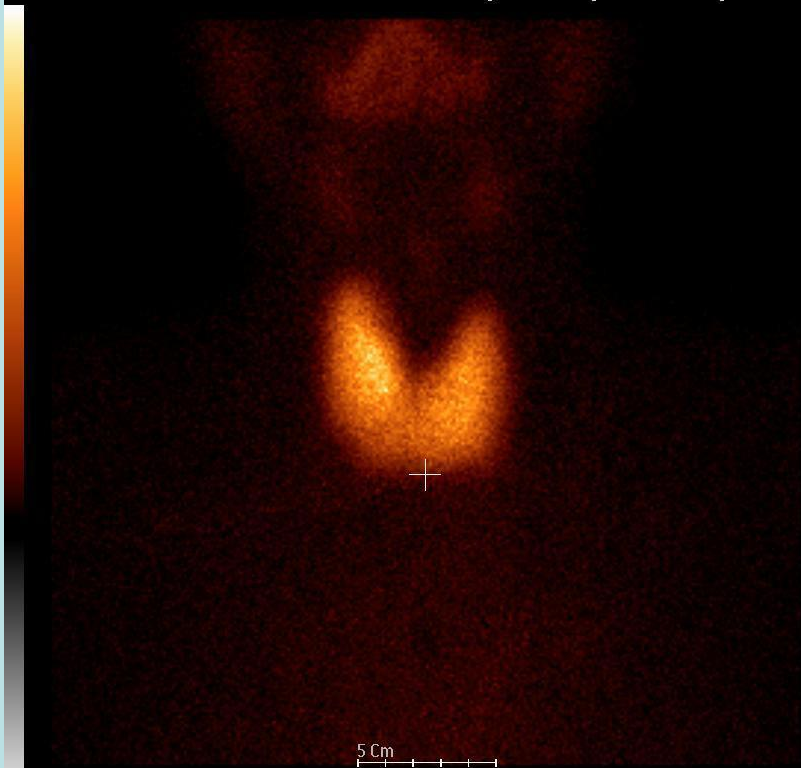


- 3 weeks later fT4 24.9
- Further 2 weeks 19.2, TSH 0.04
- Further 2 months 13.3, TSH 8.72
- **Causes of thyroiditis**
 - Acute, bacterial
 - Subacute, viral
 - Chronic, autoimmune
 - Postpartum

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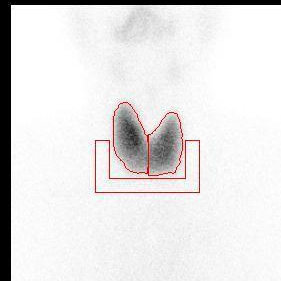
BDG Thyroid

Thyroid Uptake Report



THYROID

08/01/13 09:36:12



RIGHT LEFT
Left Uptake = 2.5 %

Counts in Left Lobe = 61993
Left Area = 16.114 cm²

Right Uptake = 2.9 %

Counts in Right Lobe = 73668
Right Area = 17.568 cm²

Thyroid Uptake = 5.4 %

Thyroid counts = 135661
Thyroid Area = 33.682 cm²

Injected Dose = 77.40

Zoom = 1.00

Transfer Coefficient = 54.20

A 62 yr old female is reviewed in the DM clinic and her pre clinic tests show the following:

- HbA1C 55 (7.2%)
- Cholesterol 5.2
- Creatinine 82
- TSH 7.3
- fT4 15.2
- What is the likely diagnosis?
- Subclinical hypothyroidism.

- What questions would you like to ask?
 - S&S
 - Hx of Thyroid dysfunction
 - FHx
 - DHx
- What further test would you like to do?
 - TPO, result < 10.
- How would you manage this patient?
 - Repeat TFT in 3 months and regular TFT thereafter.
 - If TSH > 10, symptomatic & positive antibodies commence treatment

A 35 yr old female presents with areas of skin depigmentation.
GP diagnosis vitiligo and arranges a number of blood tests
including TFT.

- TSH 0.1
- fT4 17.1
- fT3 4.2
- What are the possible underlying causes of these results?
- Subclinical hyperthyroidism
- Resolving thyroiditis
- Sick euthyroid syndrome (NTI)

- How would you manage this patient?
- Examine her neck for goitre, evidence of thyroid eye disease
- Check TPO Ab TRAb +/- ESR
- Repeat test in 3/12.

American & European Thyroid associations

TABLE 10. SUBCLINICAL HYPERTHYROIDISM: WHEN TO TREAT

<i>Factor</i>	<i>TSH (<0.1 mU/L)</i>	<i>TSH (0.1–0.4 mU/L)^a</i>
Age >65 years	Yes	Consider treating
Age <65 years with comorbidities		
Heart disease	Yes	Consider treating
Osteoporosis	Yes	Consider treating
Menopausal, not on estrogens or bisphosphonates	Yes	Consider treating
Hyperthyroid symptoms	Yes	Consider treating
Age <65 years, asymptomatic	Consider treating	Observe

^aWhere 0.4 mU/L is the lower limit of the normal range.

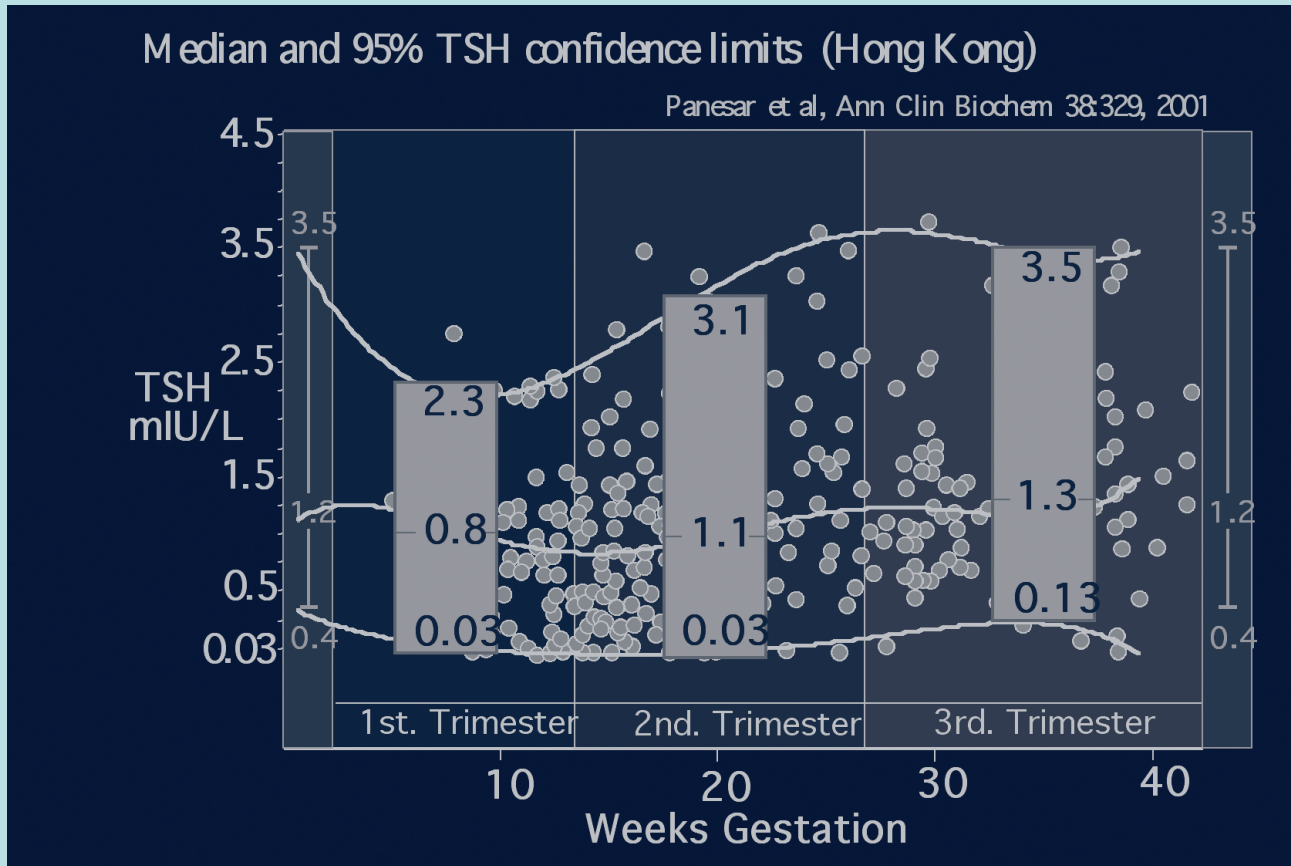
- Overall, approximately 1–5% may progress to overt thyrotoxicosis annually,
- In a five-study meta-analysis the hazard ratio for atrial fibrillation was 1.68
- Other possible effects are heart failure, osteopenia and osteoporosis.
- Another meta-analysis based on ten studies involving > 50,000 patients, showed a 24% higher all-cause mortality in subclinical thyrotoxicosis.

- However there are no large controlled intervention studies and thus there is no high quality evidence to guide treatment recommendations.
- There is no evidence for therapy and there is weak evidence of harm from thyrotoxicosis if serum TSH is in the 0.1–0.4 IU/L range.

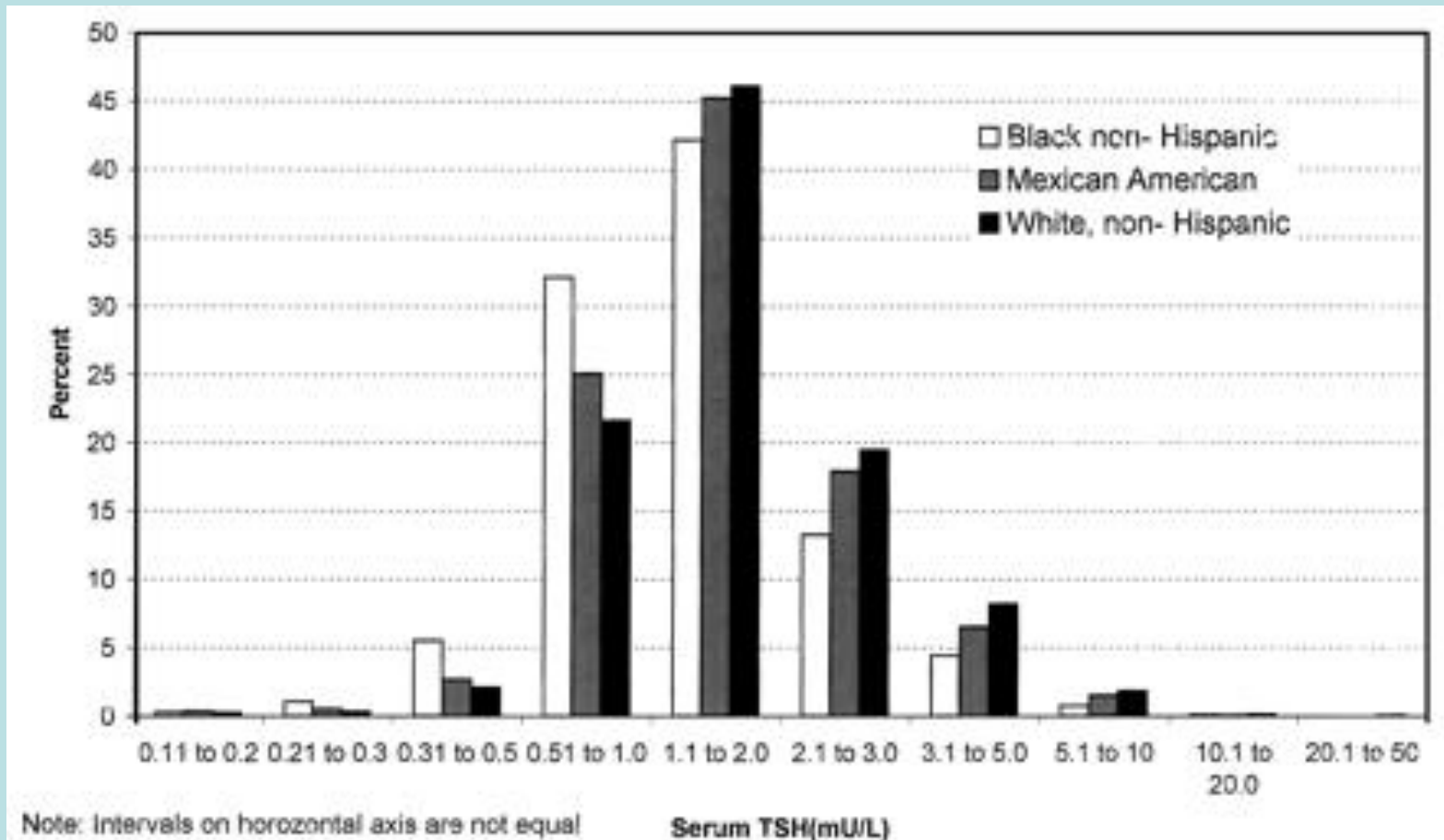
39 yrs old female, hypothyroidism for 6 yrs & hypertension

- On thyroxine 75 mcg & Ramipril 5 mg
- Planning to try for pregnancy and asks about her medication.
- Recent TFT, TSH 3.2 (0.38 – 5.5), BP 130/75
- **What would you advise?**
 - A. Stop Ramipril & continue thyroxine
 - B. Stop Ramipril & adjust thyroxine
 - C. Continue both with no change

TSH levels during pregnancy



Serum TSH distribution in U.S. reference healthy population (n=13,344)
(Hollowell et al 2002, JCEM)



39 year old man presented with ED for over 1 yr

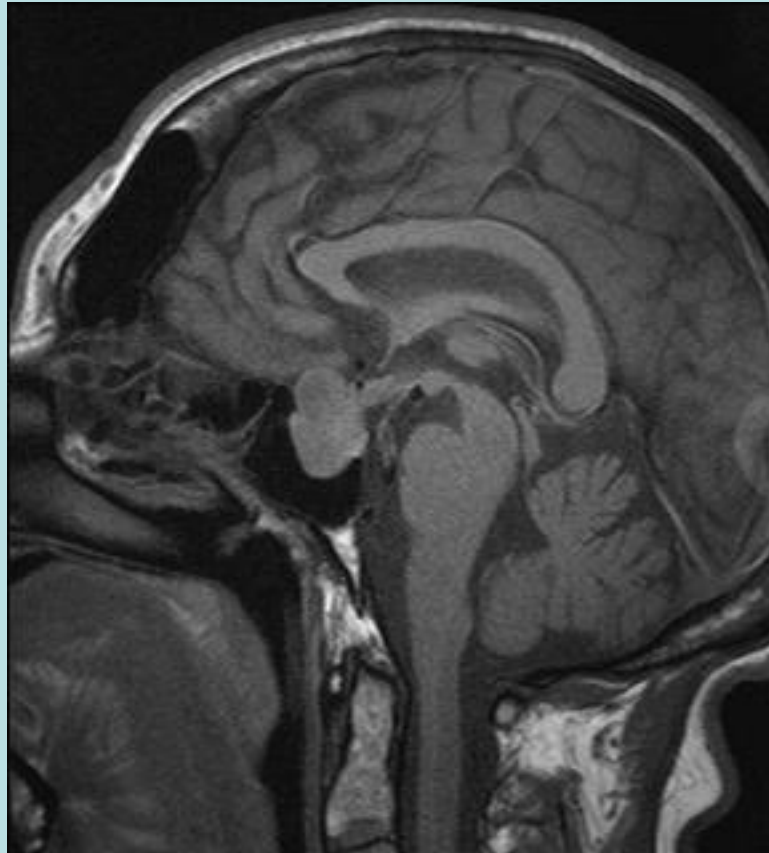
- Examination was unremarkable.
- **What tests would you do?**
- Fasting Testosterone 3.1(8.4-28.7nmol/l)
- LH 1.3 (2-12U/l) FSH 0.5 (1-12U/L).
- Dx Hypogonadotropic hypogonadism

- Further investigations: PRL,TFT,HbA1c
 - PRL 6580 (64-373 mU/l)
 - MRI 1.9 cm pituitary macroadenoma

- What symptoms do you want to ask about?
- History of headaches and visual field defects?
- Visual field assessment
- Treatment?
- Cabergoline 250 mcg 2x/wk
- Repeat PRL 4wks later, 401
- Further 6 wks, PRL 166, Testosterone 8.9

- MRI 2 years later adenoma 1 cm down from 1.9 cm and testosterone 18.3 on Cabergoline



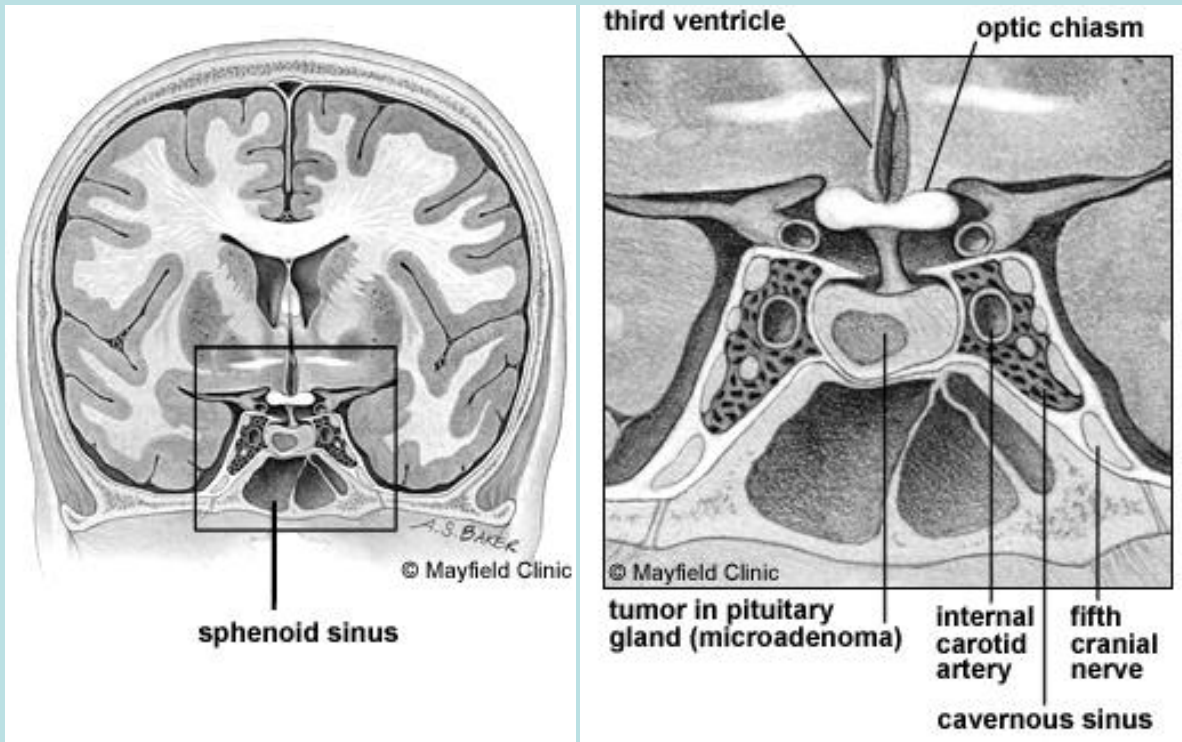


Prolactinoma

- Prolactinomas are the commonest functioning pituitary tumours (40% of all adenomas).
- Microadenomas (< 1 cm) more common (90%) than macroadenomas (> 1 cm).
- More common in females.
- 10% of the population have microadenomas.

Clinical Features

- Galactorrhea 80% in females, < 10% in males
- Menstrual disturbances in females, infertility, reduced libido
- ED and loss of libido in males.
- Mass effect
 - Headaches and visual disturbances
- Invasion of the cavernous sinuses may lead to cranial nerve palsies
- Hypopituitarism



Coronal cross-section of the head at the level of the pituitary gland

Causes of hyperprolactinemia

Physiological

Coitus

Exercise

Lactation

Pregnancy

Sleep

Stress

The stress of venepuncture may cause mild hyperprolactinemia.

Pathological

Hypothalamic-pituitary stalk damage

Granulomas

Infiltrations

Irradiation

Rathke's cyst

Trauma: pituitary stalk section, suprasellar surgery

Tumors: craniopharyngioma, germinoma, metastases

Pituitary

Acromegaly

Macroadenoma (compressive)

Macroprolactinemia

Prolactinoma

Surgery

Trauma

Systemic disorders

Chest—neurogenic chest wall trauma, surgery, shingles

Chronic renal failure

Cirrhosis

Epileptic seizures

Polycystic ovarian disease

Pharmacological

Anesthetics

Anticonvulsant

Antidepressants

Antihistamines (H₂)

Antihypertensives

Cholinergic agonist

Drug-induced hypersecretion

Catecholamine depletor

Dopamine receptor blockers

Dopamine synthesis inhibitor

Estrogens: oral contraceptives; oral contraceptive withdrawal

Neuroleptics/antipsychotics

Neuropeptides

Opiates and opiate antagonists

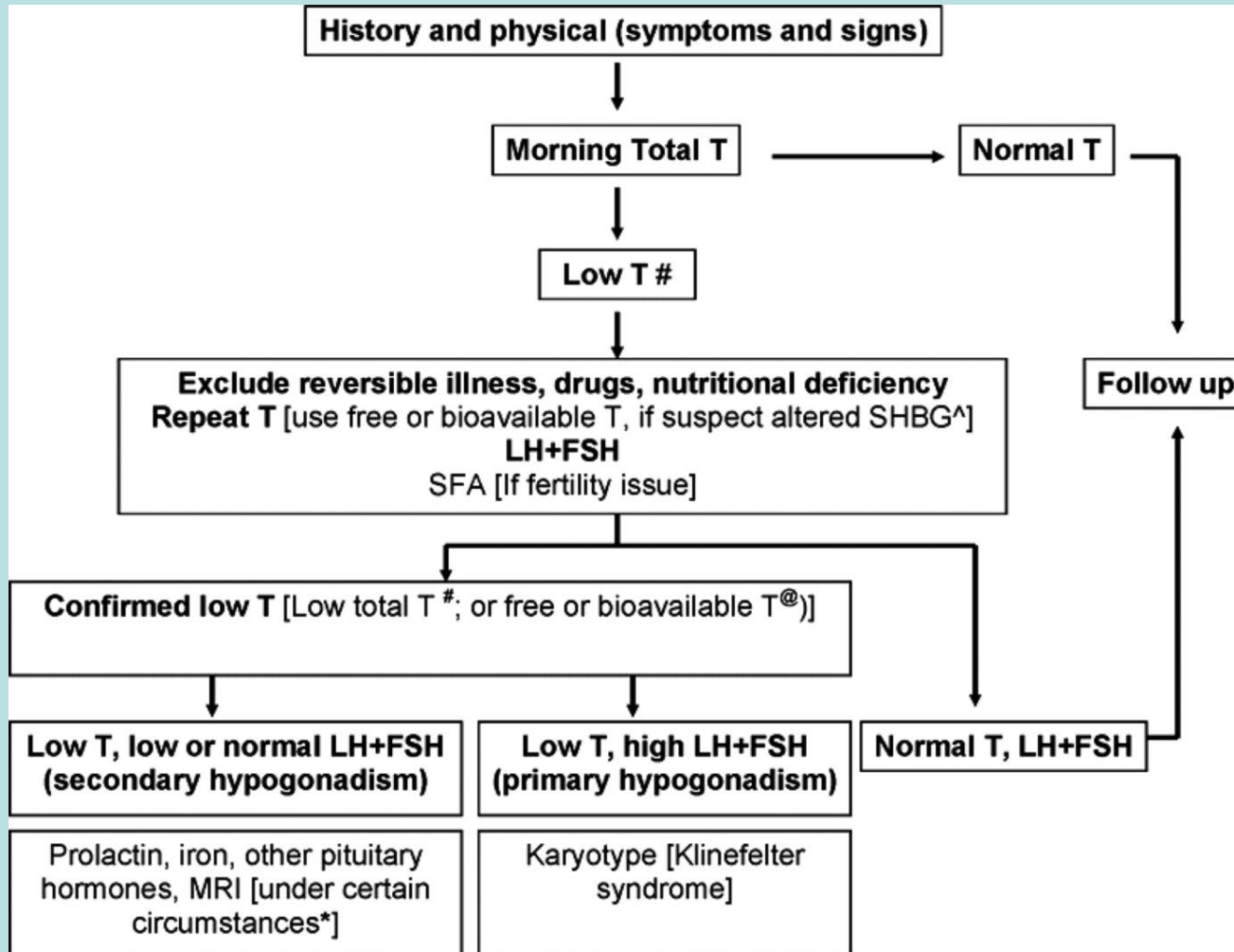
28 yrs old man presents with lack of energy, reduced libido & ED

- Fasting testosterone profile, LH, FSH, prolactin
- Fasting T is 7.8, LH 4.1, FSH 5.1, PRL 188
- What questions would you ask in his history?
- Head injury, orchitis, testicular injury,
- Any use of anabolic steroids
- What further tests are needed?
- Pituitary hormone profile & MRI pituitary

Management

- What treatment options?
- Any plans for children/semen analysis
- Testosterone replacement (Testosterone gel or IM Nebido)
- or HCG (Gonasi)/FSH (Gonal-F) S/C 2-3X per week.

An approach for the diagnostic evaluation of adult men suspected of having androgen deficiency.



Causes of primary & secondary hypogonadism

Primary Hypogonadism

ORGANIC

Klinefelter's syndrome

Cryptorchidism, myotonic dystrophy, anorchia

Some types of cancer chemotherapy, testicular irradiation/damage, orchidectomy

Orchitis

Testicular trauma, torsion

Advanced age

FUNCTIONAL

Medications (androgen synthesis inhibitors)

End-stage renal disease^a

Secondary Hypogonadism

Hypothalamic/pituitary tumor

Iron overload syndromes

Infiltrative/destructive disease of hypothalamus/pituitary

Idiopathic hypogonadotropic hypogonadism

Hyperprolactinemia

Opioids, anabolic steroid use, glucocorticoids

Alcohol and marijuana abuse^a

Systemic illness^a

Nutritional deficiency/excessive exercise

63 year old man

- Presented with recurrent episodes of hypoglycemia (3-4 x/wk).
- PMH
 - Diabetes, hypertension
 - Gastric bypass surgery 2017
(Lost 60 kg in weight following surgery)
- What is the likely diagnosis?

Late dumping syndrome

- usually 1-3 hours after eating.
- Due to the dumping of large amount of sugars into the small intestine (hyperglycemia).
- In response, the body releases large amounts of insulin, leading to low levels of sugar in the body(hypoglycemia).
- Symptoms of late dumping can include:
 - Sweating, Hunger, Fatigue, Dizziness, light-headedness, Confusion, palpitations, Fainting.

Management

- Eat smaller meals. Six small meals a day.
- Avoid fluids with meals.
- Avoid food with sugar. Avoid alcohol.
- Consume more protein.
- Increase fibre intake
- Medications
 - Acarbose, delays the digestion of carbohydrates.
 - Octreotide (Sandostatin). slows down the emptying of food into the intestine.

Causes of hypoglycemia in adults

1. Drugs

Insulin or insulin secretagogue

Alcohol

Others

2. Critical illnesses

Hepatic, renal, or cardiac failure

Sepsis (including malaria)

3. Hormone deficiency

Cortisol

4. Nonislet cell tumor

5. Endogenous hyperinsulinism

Insulinoma

Functional β -cell disorders (nesidioblastosis)

Post gastric bypass hypoglycemia

Insulin autoimmune hypoglycemia

Antibody to insulin

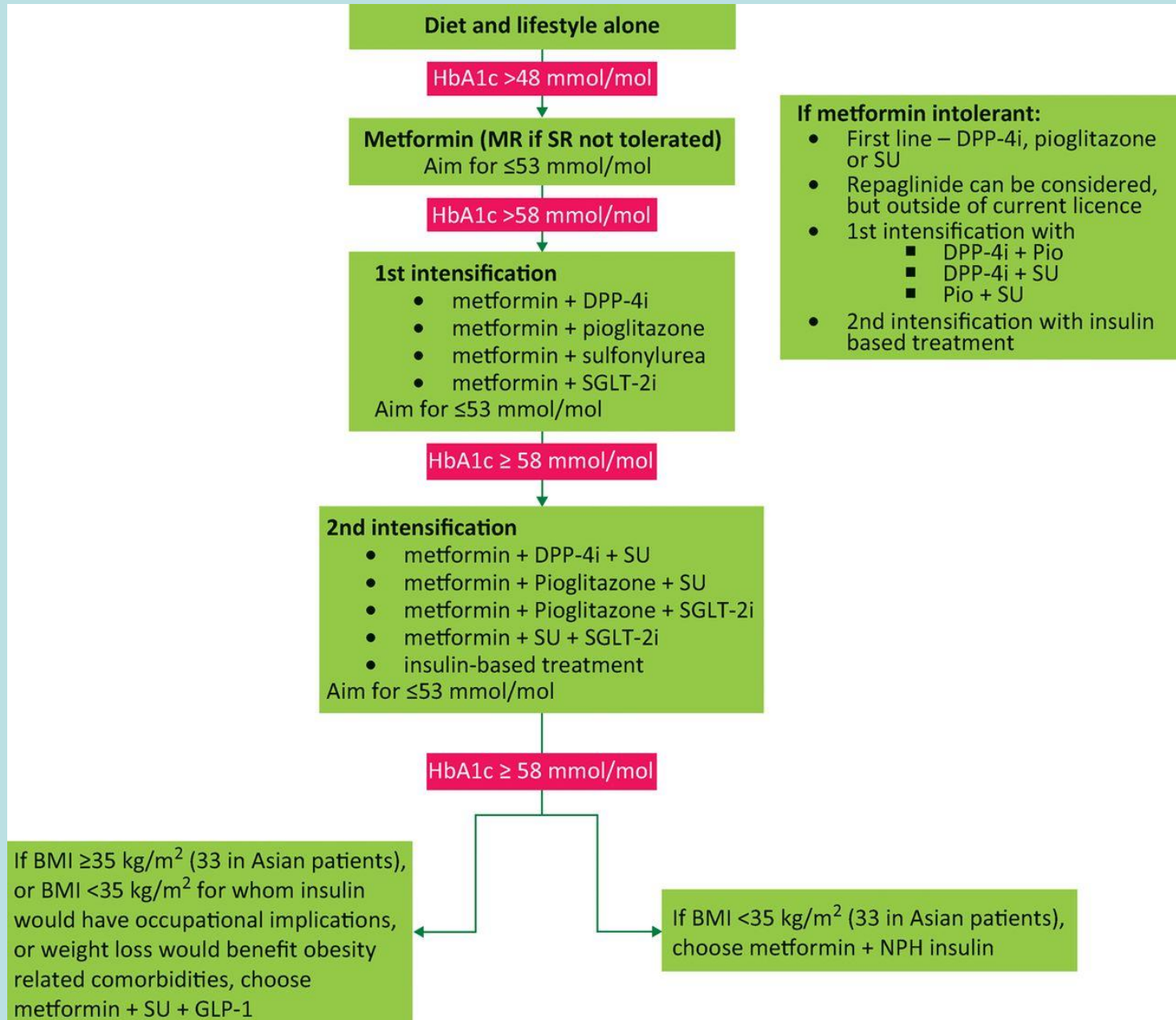
Antibody to insulin receptor

6. Accidental, surreptitious, or malicious hypoglycemia

57 year old female

- Seen in diabetes clinic
- Diabetes for 4 years, BMI 34
- On metformin 1 gm bd, Sitagliptin 100mg od
- HbA1c 67 (8.3%).
- **What would you do?**
- Review diet and exercise
- SGLT-2 inhibitor (Empagliflozin, Canagliflozin)
- GLP-1 analogue (incretin mimetic), exenatide or liraglutide given s/c
- Review in 3 months

NICE guidelines T2DM, 2015



Individualised Care

Individualised glycaemic control: ADA/EASD approach to the management of hyperglycaemia.¹

More stringent

Less stringent

Patient attitude and expected treatment efforts

Highly motivated, adherent, excellent self-care capacities

Less motivated, non-adherent, poor self-care capacities

Risks potentially associated with hypoglycaemia, other adverse events

Low

High

Disease duration

Newly diagnosed

Long-standing

Life expectancy

Long

Short

Important comorbidities

Absent

Severe

Established vascular complications

Absent

Severe

Resources, support system

Readily available

Limited

ADA=American Diabetes Association; EASD=European Association for the Study of Diabetes

1. Inzucchi SE. *Diabetes Care* 2012;35:1364–1379.

A 73 yr old woman with T2DM for 5 yrs, hypertension & renal impairment (eGFR 49). HbA1C 63 (7.9%).

- What would you start her on in addition to life style changes?
 - A. Metformin
 - B. gliptin (sitagliptin, Linagliptin)
 - C. SGLT-2 inhibitor (canagliflozin, empagliflozin)
 - D. Gliclazide

64 yrs old female known T2DM, COPD & adrenal insufficiency

- 3 days history of diarrhea & vomiting
- Feeling tired
- BP 110/60, P 85
- **What would you do?**
 - A. encourage oral intake and give loperamide
 - B. IV/IM hydrocortisone 100 mg & admit
 - C. Double oral dose of steroids until better

Sick day rules in adrenal insufficiency

- Double dose of oral steroids during
 - Illness with fever.
 - Illness requiring bed rest.
 - Illness requiring treatment with antibiotics.
- Inject IM hydrocortisone and seek medical help if:
 - Vomiting & diarrhea.
 - Severe illness and low BP.



STEROID-DEPENDENT PATIENT REQUIRES CONTINUOUS/PARENTERAL STEROID COVER

See Surgical Guidelines:
www.addisons.org.uk/surgery

TYPE OF PROCEDURE	PRE-OPERATIVE AND OPERATIVE NEEDS (See Notes 1, 2)	POST-OPERATIVE NEEDS (See Notes 6, 8, 9)
LENGTHY, MAJOR SURGERY WITH LONG RECOVERY TIME <i>eg. open heart surgery, major bowel surgery,</i>	100mg hydrocortisone IM or IV just before anaesthesia. (See Notes 2, 3, 7) Immediately followed by: ■ 100mg IM or IV 6 hourly or ■ continuous infusion 200mg/24 hours	100mg IM or IV every 6 hours or continuous IV infusion 200mg/24 hours (See Notes 3, 5) or until able to eat & drink normally (discharged from ITU) If well, then double oral dose for 48+ hours. Then taper the return to normal dose
MAJOR SURGERY WITH RAPID RECOVERY <i>eg. caesarean section, joint replacement</i>	100mg hydrocortisone IM or IV just before anaesthesia. (See Notes 2, 6, 7) Immediately followed by: ■ 100mg IM or IV 6 hourly or ■ continuous infusion 200mg/24 hours	100mg IM or IV or continuous infusion 200mg/24 hours for 24 - 48 hours (See Notes 3, 5) for 24 - 48 hours (or until able to eat and drink normally) If well, then double oral dose for 24 - 48 hours. Then return to normal dose
LABOUR AND VAGINAL BIRTH	100mg hydrocortisone IM or IV at onset of active labour. (See Note 4-7) Immediately followed by continuous IV infusion 200mg/24 hours or 100mg IM or IV 6 hourly until delivery	Double oral dose for for 24 - 48 hours after delivery. If well, then return to normal dose
MINOR SURGERY <i>eg. cataract surgery, hernia repairs, laparoscopy with local anaesthetic</i>	100mg hydrocortisone IM just before anaesthesia (See Note 6)	Double oral dose for 24 hours. Then return to normal dose
MINOR PROCEDURE <i>eg. skin mole removal with local anaesthetic</i>	Take an extra oral dose, 60 minutes ahead of the procedure	An extra dose 60 minutes after the procedure. Then return to normal dose
INVASIVE BOWEL PROCEDURES REQUIRING LAXATIVES <i>eg. colonoscopy, barium enema</i>	Hospital admission overnight with IV fluids and 100mg hydrocortisone IM during preparation. (See Notes 3, 5, 6) 100mg hydrocortisone IM at commencement (See Notes 1, 6)	Double dose oral medication for 24 hours. Then return to normal dose
OTHER INVASIVE PROCEDURES <i>eg. endoscopy, gastroscopy</i>	100mg hydrocortisone IM just before commencing	Double dose oral medication for 24 hours. Then return to normal dose
MAJOR DENTAL SURGERY <i>eg. dental extraction/s with local or general anaesthetic</i>	100mg hydrocortisone IM just before anaesthesia (See Notes 6, 7, 8)	Double dose oral medication for 24 hours. Then return to normal dose
DENTAL SURGERY <i>eg. root canal work with local anaesthetic</i>	Double oral dose (up to 20mg hydrocortisone) one hour prior to surgery	Double dose oral medication for 24 hours. Then return to normal dose
MINOR DENTAL PROCEDURE <i>eg. replace filling, scale and polish</i>	Take an extra oral dose, 60 minutes ahead of the procedure	An extra dose where hypoadrenal symptoms occur afterwards. Then return to normal dose

56 yrs old man with previous TSS for pituitary non-functioning macroadenoma

- Hypopituitarism on HC 10x5x5mg, thyroxine 100 mcg, Testogel 50 mg.
- Recent blood tests show FT4 17.8, FT3 4.8, TSH 0.01
- **What would you do?**
 - A. Continue same dose of thyroxine
 - B. Reduce dose to 75 mcg
 - C. Reduce to dose to 50 mcg.

26 year old lady presents with hirsutism, oligomenorrhea and difficulty losing weight

- No other PMH of significance
- You suspect PCOS
- **D.Dx**
- Nonclassical CAH
- Cushing's syndrome
- Hypothyroidism
- Androgen producing tumours (ovarian/adrenal)
- **Investigations**
- Testosterone profile Testosterone 2.4, FAI, SHBG
- LH 8.2, FSH 5.5, E2 290, PRL 190, TSH 2.8, HbA1c 38
- US ovaries

Polycystic ovary Syndrome

- Affects about 10% of women.
- The Rotterdam diagnostic criteria, 2 of 3 features:
 - Oligomenorrhea/ameorrhea
 - Hyperandrogenism (clinical or biochemical).
 - Polycystic ovaries on US (> 20 follicles/ovary &/or ovarian volume \geq 10 ml)
- Insulin resistance plays a major role in the pathophysiology and clinical manifestations of PCOS

Associated morbidities

- Cutaneous
 - Acne, alopecia, acanthosis nigricans, skin tags
- Infertility
- Pregnancy complications, increased risk of:
 - Gestational DM, preterm labour & pre-eclampsia.
- Increased risk of endometrial cancer.
- Obesity
- Depression/anxiety
- OSA
- T2DM

Management

- Life style changes, diet and exercise to lose weight
- COCP, Dianette (ethinyloestradiol/cyproterone acetate)
- Metformin
- Vaniqa cream (Eflornithine)
- Inositol (inofolic) considered experimental therapy
- Clomiphene citrate
- Exogenous gonadotrophins
- Laproscopic ovarian surgery/drilling

- Myo-inositol (MI) acts as an intracellular second messenger and regulates a number of hormones such as TSH, FSH and insulin.
- Insulin induces androgen synthesis in the ovaries.
- In view of its recognized insulin-sensitizing activity, MI has been used to treat a number of metabolic disorders related to IR, such as, gestational diabetes mellitus and the PCOS.

62 yrs old woman presents with lethargy and mild confusion

- Confusion screen reveals adjusted calcium 2.8
- What is your next test to differentiate the cause?
- PTH 7.7 (1.49 – 8.0)
- What is the likely diagnosis?
- Primary hyperparathyroidism
- Familial hypocalcemic hypercalcemia

- What further tests?
- 24 urine calcium and Calcium excretion
- Renal US, DXA scan, Mibi scan and neck US

Management

- IV fluids 3L/day
- IV bisphosphonate
- **Indications for surgery**
- Adjusted calcium ≥ 2.85
- Renal stones
- Osteoporosis
- Age < 50 years
- If adjusted calcium is stable and < 2.85 with no complications then continue monitoring 6 monthly

57 year old female falls and sustains fracture of her wrist

- **PMH** coeliac disease, T2DM, hypertension
- **DH** Metformin, ramipril, lansoprazole
- **SH** smokes 10 cig/day, drinks 3 glasses of wine per week
- **FH** mother had hip fracture age 86

57 year old female falls and sustains fracture of her wrist

- **PMH** **coeliac** disease, **T2DM**, hypertension
- **DH** Metformin, ramipril, **lansoprazole**
- **SH** **smokes** 10 cig/day, drinks 3 glasses of wine per week
- **FH** mother had hip fracture age 86
- **Other questions to ask?**
- Diet, dairy products/milk intake
- Age of menopause
- Physical activity

Investigations

- DXA scan
- Check Vitamin D levels
- In some cases exclude other secondary causes by checking:
- FBC, U&Es, LFT, Calcium profile, vitamin D, ESR, immunoglobulins, coeliac screen, TFT and fasting testosterone in men



FRAX[®] WHO Fracture Risk Assessment Tool

Calculation Tool

Please answer the questions below to calculate the ten year probability of fracture with BMD.



Country: **UK**

Name/ID:

[About the risk factors](#)

Questionnaire:

- 1. Age (between 40 and 90 years) or Date of Birth
Age: Date of Birth: Y: M: D:
- 2. Sex Male Female
- 3. Weight (kg)
- 4. Height (cm)
- 5. Previous Fracture No Yes
- 6. Parent Fractured Hip No Yes
- 7. Current Smoking No Yes
- 8. Glucocorticoids No Yes
- 9. Rheumatoid arthritis No Yes

- 10. Secondary osteoporosis No Yes
- 11. Alcohol 3 or more units/day No Yes

12. Femoral neck BMD (g/cm²)
 T-score: -2.6

BMI: 27.5
The ten year probability of fracture (%)
with BMD

Major osteoporotic	24
Hip Fracture	8.2

Weight Conversion

Pounds kg

Height Conversion

Inches cm

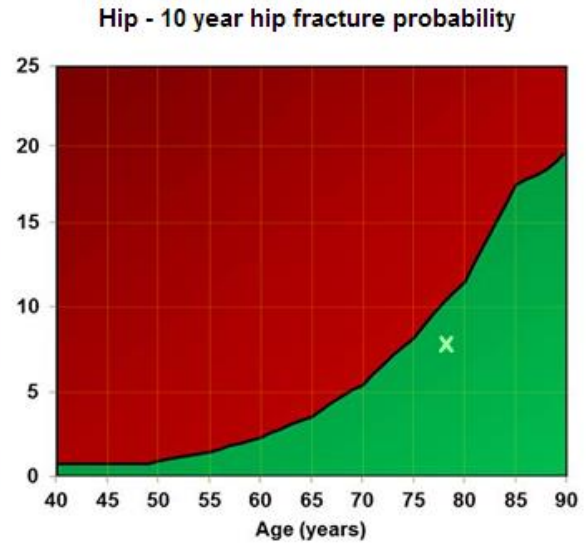
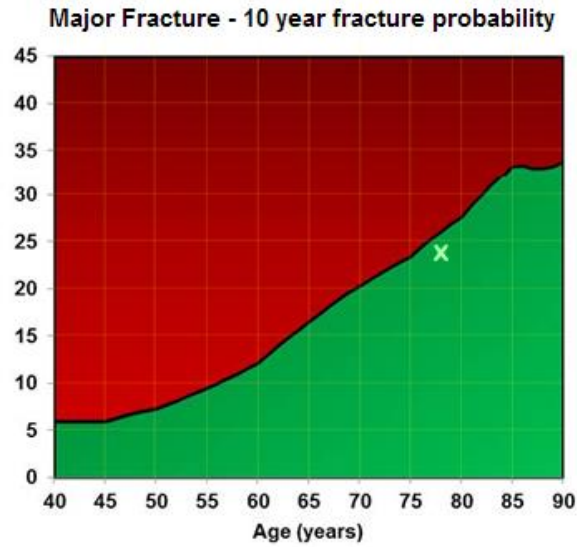
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Individuals with fracture risk assessed since 1st June 2011

Graphs

[Back to FRAX Home](#) [Back to NOGG Home](#) [Manual Data Entry](#) [FAQ](#) [Download Documents](#)

Intervention Threshold



 Treat
 Lifestyle advice and reassurance

Treatment is recommended in the majority of elderly women with a prior fracture, even if the probability lies below the intervention threshold after BMD measurement.

Treatment

- Lifestyle Measures
- Medication



Lifestyles Measures

- All PMW with osteoporosis should receive adequate **calcium**, 1200 mg/day & **vitamin D**, 800-1000 IU/day.
- Other important measures include:
 - **exercise**, at least 30 minutes 3X/week,
 - smoking cessation,
 - Fall prevention, and
 - avoid heavy alcohol use.

Medication

- Bisphosphonate
 - efficacy, favourable cost, long-term safety data.
 - Oral: alendronate, risedronate. IV: Zoledronate
- Ca & Vit D
- Denosumab S/C (monoclonal Ab)
- Oestrogen
- Raloxifen (SERM) (OP & risk of breast CA)
- PTH (teriparatide)-anabolic agent (not antiresorptive).
 - Usually used in patient with OP and fractures on other agents.



47 yrs old man attends for a regular check up, HbA1c 44

- What is your next test?
- OGTT
- Results
- Fasting glucose 5.8 & 2 hrs post glucose load 8.9
- Dx Impaired glucose tolerance (prediabetes)

Prediabetes

- Consists IFG &/or IGT and is a significant risk factor for the development of type 2 DM, microvascular, and macrovascular disease.
- It is an intermediate stage between normal glucose levels and type 2 DM.
- **IFG:** FPG between 6.1 & 7.0 mmol/l.
- **IGT:** an abnormal 2-h response to a 75-g OGTT of at least 7.8 mmol/l but <11.1 mmol/l.
- HbA1c 6.0 – 6.4% (42 – 48 mmol/mol)
- This risk of developing DM is about 5–10% per year.

Criteria for screening for diabetes (Diabetes UK recommendations)

a) White aged > **40 years** and minority ethnic groups > **25** with ≥ 1 of the risk factors below:

- a first degree family history of diabetes and/or

- BMI ≥ 25 kg/m², and have a sedentary lifestyle

- Waist measurement of over > 94cm for White and Black men and > 80cm for White, Black and Asian women, and > 90cm for Asian men.

b) Hx of IHD, CVA, PVD or treated hypertension

c) Hx of gestational diabetes who have tested normal following delivery (screen within 6 weeks of delivery and then 1 year post-partum and then three-yearly)

d) Women with PCOS

e) Known IGT or IFG.

f) Severe mental health problems.

g) Hypertriglyceridemia not due to alcohol excess.

Management of Prediabetes

- **Lifestyle** changes have demonstrated benefit in preventing or delaying the progression to diabetes.
- Both the *Finnish Diabetes Prevention Study* and the *Diabetes Prevention Programme* demonstrated a 58% reduction in the progression to DM with intensive lifestyle changes.
- In the DPP, lifestyle intervention had a goal of at least 7% weight loss and at least 150 min of physical activity/week.
- The risk reduction was greatest in those who maintained the lifestyle goals of weight loss, reduced fat intake, increased fibre intake, and increased physical activity .

Management of prediabetes (cont.)

- The use of metformin is recommended for individuals who are at greater risk of progression to diabetes.
- Thus, metformin is considered in individuals
 - < 60 yr of age,
 - with a BMI of at ≥ 35 kg/m², and
 - Women with previous GDM.
- At least annual monitoring for the development of DM in those with prediabetes is recommended.
- Plus screening for and treatment of modifiable risk factors for CVD.

Thank you