

ULTRA Medicine Pre-Course Material Exam 2011

[1] A 68-year old gentleman presents to his GP with shortness of breath lasting for the last 7 days, but specifically worsening over the last 48 hours, such that he is unable to climb the stairs, and he has slept in his living room armchair for the last 2 nights. He also complains of mild retrosternal chest aching that has been present for the last 2 weeks, but he puts this down to an endoscopy and ERCP that he had 18 days ago for gallstone disease, that had in itself been successful in alleviating his symptoms of jaundice and abdominal pain. The gentleman's respiratory rate in the GP surgery is 22. His chest has decreased air entry at the right base. The GP organizes a CXR, which is returned to him the same day, and shows the following...



The GP thinks the best place for this man's further investigation is the hospital, so he calls you as the Medical SHO on-call and you agree to admit him. His clinical condition on arrival is unchanged. His SpO₂ on room air is 95%. He is afebrile.

- [i] What does the CXR performed by the GP show?
- [a] nil acute
 - [b] R hilar lymphadenopathy
 - [c] cardiomegaly
 - [d] R basal consolidation
 - [e] R basal effusion
- [ii] What clinical sign is most likely to go along with the CXR findings?
- [a] bronchial breathing R base
 - [b] whispering pectiloquy R base
 - [c] stony dull percussion note R base
 - [d] Horner's syndrome R side
 - [e] aegophony L base
- [iii] What is the **most important** next investigation?
- [a] repeat CXR
 - [b] arterial blood gases
 - [c] administer high flow oxygen
 - [d] diagnostic tapping of effusion
 - [e] high resolution CT thorax

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At some point in his hospital management (rightly or wrongly), the patient has a diagnostic tap performed on his chest. The results from the lab are phoned through as the following...

Appearance: clear, straw-coloured

pH 7.36

Protein 50 g/L

LDH 300 i.u.

Cytology: a few red cells, no white cells, no malignant cells

Glucose 5.5mmol/l (blood glucose at the time 5.9mmol/l)

Gram Stain: NAD

Amylase 500 i.u./l (RR <300i.u./l)

[iv] What is the unifying diagnosis?

- [a] pneumonia
- [b] cardiac failure
- [c] oesophageal rupture
- [d] pancreatitis
- [e] cholecystitis

[2] A 59-year old shop-keeper presents to her GP complaining of an obvious inability to perform her activities of daily living as quickly and smoothly as she used to. Specifically, stacking the shelves of her small corner shop has become a laborious task, not due to weakness of any kind, but due to generalized "slowness". Her husband has told her that she is "slowing down" and it's all related to her age, but the patient herself is most concerned. She feels that her symptoms affect her left more than her right side. The symptoms are getting her down, and many of her friends have commented to her lately on how "troubled" she looks all the time. On examination, the only positive findings are a mild resting tremor affecting the left arm, along with slight hypertonia of the left sided limbs. The patient has an expressionless face.

[i] What is the most likely diagnosis?

- [a] brain tumour
- [b] Parkinson's disease
- [c] myasthenia gravis
- [d] myotonic dystrophy
- [e] motor neurone disease

[ii] What is the most likely neuropathological finding?

- [a] glioblastoma multiforme
- [b] prion proteins throughout the cerebellar hemispheres
- [c] spongiform change in the substantia nigra
- [d] demyelination in discrete areas throughout the brain and spinal cord
- [e] selective degeneration of the striatonigral dopaminergic pathway

[iii] What is the most appropriate first treatment in a woman of this age?

- [a] a dopamine agonist
- [b] copper chelation
- [c] L-DOPA
- [d] iron chelation
- [e] pyridostigmine

[3] A 59-year old church warden presents to her GP with a 9-month history of generalized itching. She is also tired all the time, and has recently noticed that she has “become a bit yellow”. She denies bowel symptoms. She did have a tattoo of a dolphin at the age of 29 in Weston-Super-Mare, but has no further body art or piercings. She used to like eating shellfish, but stopped 3 years ago after watching an episode of Panorama. She has had only one sexual partner for the last 40 years – her husband. Her only past medical history is inflammatory rheumatoid-type arthritis. On examination there are no signs of chronic liver disease. She has scratch marks over her entire abdomen, where despite your best efforts you cannot elicit any shifting dullness or fluid thrill. She has 3-finger breadth firm hepatomegaly. There are tendon xanthomas present at both the elbows and the Achilles tendons.

[i] Which of these investigations will NOT be useful in confirming the most likely diagnosis?

- [a] HLA status
- [b] anti-dsDNA levels
- [c] anti-mitochondrial autoantibody levels
- [d] LFT's
- [e] liver biopsy

[ii] What is the most likely diagnosis?

- [a] primary sclerosing cholangitis
- [b] chronic hepatitis B
- [c] chronic hepatitis C
- [d] human immunodeficiency virus
- [e] primary biliary cirrhosis

[iii] Which of these agents is not useful in the treatment of the underlying condition?

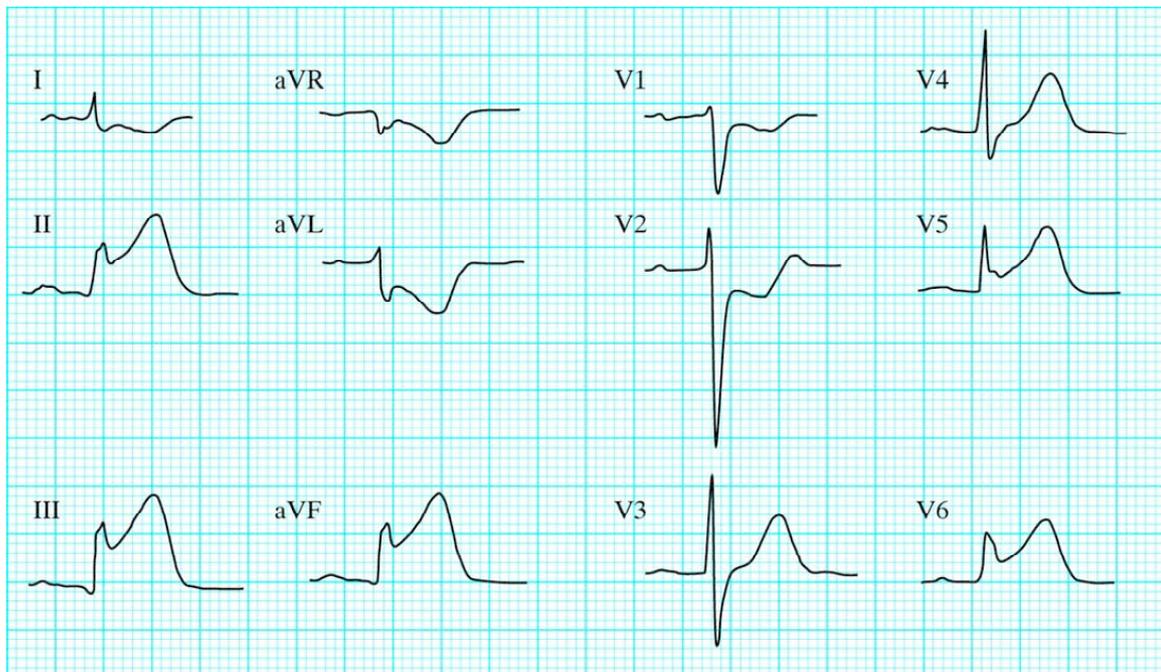
- [a] vitamin K dietary supplements
- [b] ursodeoxycholic acid
- [c] liver transplantation
- [d] cholestyramine
- [e] naloxone/nalmifene

[4] A 49-year old lorry driver presents to A&E with a 30-minute history of sudden-onset crushing central chest pain. He is a smoker, but has no history of COPD. He has just returned from a holiday to Tenerife. He keeps pigeons in his spare time. On examination, his airway is safe, his resp rate is 20, his SpO₂ is 98% on room air, his chest appears clear, his heart rate is 100 and regular, his BP is 160/90, his JVP is not raised, his heart sounds are I+II+0, there is no peripheral oedema, and his abdomen is soft and non-tender. He says his pain is 10/10 in severity, and he is sweaty and nauseated.

[i] Which four of the following are not indicated immediately/urgently on arrival?

- [a] arterial blood gases
- [b] chest radiograph
- [c] ECG
- [d] sublingual GTN spray
- [e] spiral chest CT
- [f] iv access
- [g] send blood for routine tests
- [h] group and save, with crossmatch four units packed red cells
- [i] buccal GTN tablet
- [j] high flow oxygen delivered by mask and rebreathe bag
- [k] iv morphine
- [l] anti-emetic
- [m] thrombolysis
- [n] aspirin 300mg stat
- [o] clopidogrel 300mg stat only if ECG changes of ischaemia are present

The patient underwent an ECG, the results of which are shown...



[ii] The ECG shows...

- [a] pericarditis
- [b] thoracic aortic aneurysm rupture
- [c] inferior myocardial infarction
- [d] lateral myocardial infarction
- [e] inferolateral myocardial infarction

[iii] The most appropriate treatment is...

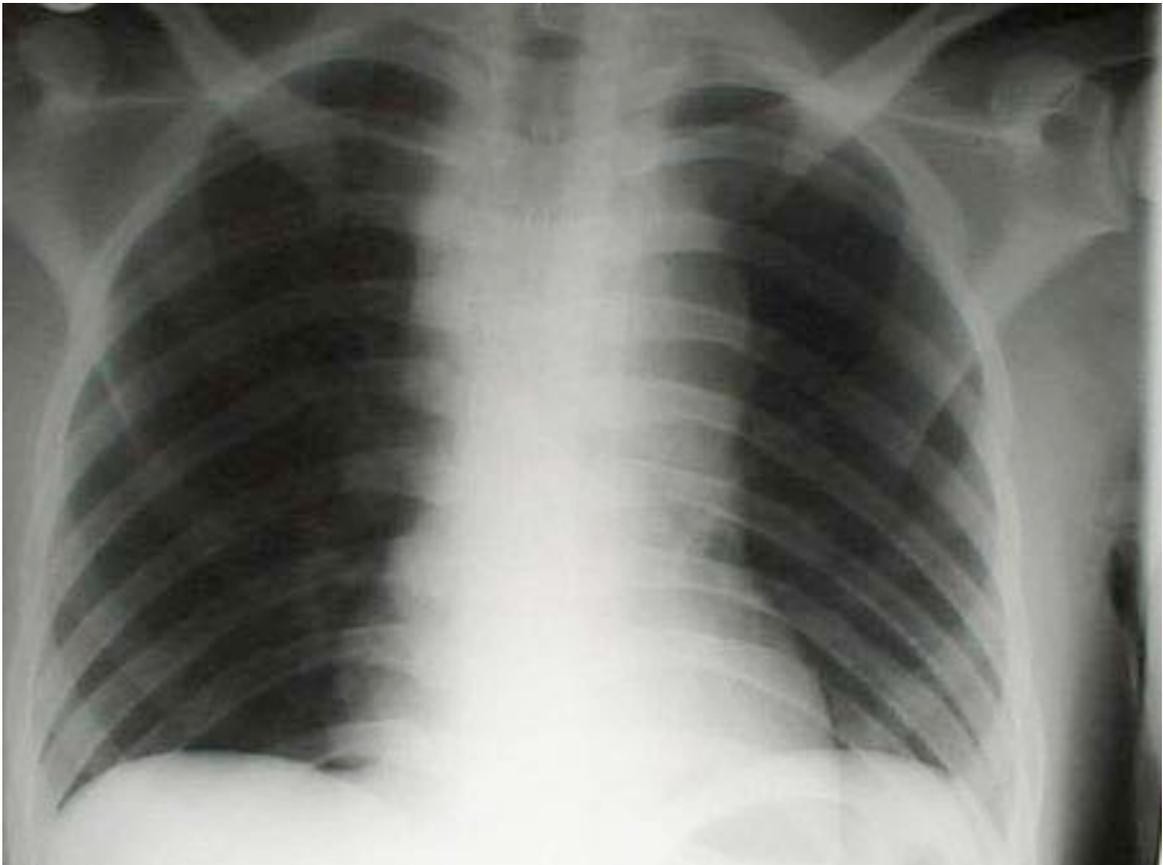
- [a] aspirin, clopidogrel and low molecular weight heparin
- [b] angiography
- [c] coronary artery bypass grafting
- [d] emergency percutaneous transluminal coronary angioplasty at a specialist centre
- [e] MUGA scan

During the patient's recovery he is noted to have a cholesterol of 6.5 mmol/l.

[iv] Each of the following drugs are appropriate therapy for a high total cholesterol, except...

- [a] HMG CoA reductase inhibitors
- [b] salmon calcitonin
- [c] gemfibrozil
- [d] cholestyramine
- [e] ezetimibe

[5] A 29-year old male basketball player presents with tearing interscapular chest pain. You are the RMO who gets called by an inept A&E SHO who has barely taken any history, performed a poor examination and only organized a CXR, which you look at before examining the patient...



[j] The CXR shows...

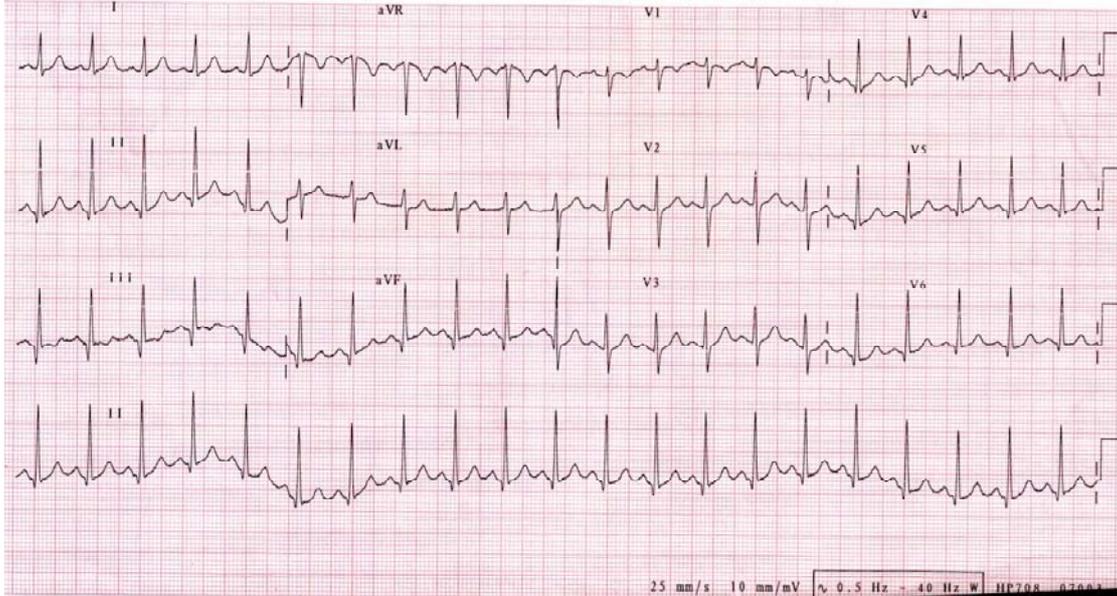
- [a] right lower lobe collapse
- [b] widened mediastinum
- [c] left lower lobe collapse
- [d] fracture dislocation left shoulder
- [e] acute anterior myocardial infarction

You complete a brief history and examination of the patient. His blood pressure is 250/150. You think you hear a faint early diastolic murmur at the left sternal edge.

[ii] The murmur is most likely to be...

- [a] aortic sclerosis
- [b] aortic stenosis
- [c] aortic regurgitation
- [d] patent ductus arteriosus
- [e] patent foramen ovale

You immediately instruct the staff nurse to do an ECG...



[iii] The most significant abnormality on this ECG is...

- [a] sinus tachycardia
- [b] sinus arrhythmia
- [c] S1,Q3,T3
- [d] pathological Q waves
- [e] tented T waves

You manage to stabilize the patient, and take the time to go and give an update to the patient's father who is in the waiting room...



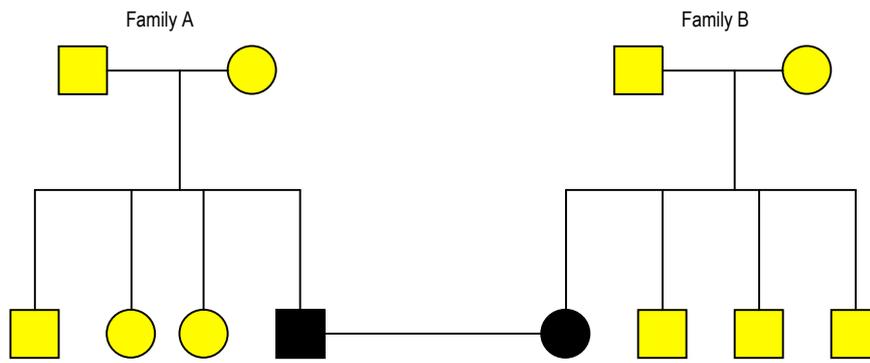
[iv] What diagnosis is suggested by the patient's presentation and father's appearance?

- [a] Klinefelter's syndrome
- [b] osteogenesis imperfecta
- [c] Turner's syndrome
- [d] Fitz-Hugh-Curtis syndrome
- [e] Marfan's syndrome

[v] What is the most important early treatment?

- [a] blood pressure lowering
- [b] thrombolysis
- [c] surgical repair of the aorta
- [d] coronary artery bypass grafting
- [e] closure of congenital heart defect

[6] You are shown the following pedigree by a geneticist investigating a couple, both of whom have presented with pigmented skin and diabetes...



-  Unaffected female (does not exclude that individual may be carrier in recessive condition)
-  Affected female
-  Unaffected male (does not exclude that individual may be carrier in recessive condition)
-  Affected male

[i] What is the pattern of inheritance shown in both families?

- [a] Maternal mitochondrial
- [b] Autosomal dominant
- [c] X-linked dominant
- [d] Autosomal recessive
- [e] X-linked recessive

The married couple with the disorder are keen to have children.

[ii] What are the chances that their children will be affected by the condition (assuming the mutation causing the condition is the same in both families)?

- [a] 0%
- [b] 25%
- [c] 50%
- [d] 100%
- [e] Impossible to say

[iii] The likely diagnosis based on the information given above is...

- [a] Wilson's disease
- [b] hereditary haemochromatosis
- [c] Antithrombin III deficiency
- [d] familial adenomatous polyposis coli
- [e] Huntington's syndrome

[iv] Each of the below conditions are inherited in the same way, except...

- [a] Polycystic kidney disease
- [b] Cystic fibrosis
- [c] Sickle cell anaemia
- [d] Friedreich's ataxia
- [e] Wilson's disease

[7] You are called to see a patient on the surgical ward because of poor urine output. The 69-year old gentleman had a fem-pop bypass 36 hours before. He has been on iv fluids since the op because he has been unable to drink due to nausea. His input-output chart is shown...

ST ELSEWHERE NHS TRUST				Date: 31/1/06				
TIME	INPUT			Total	OUTPUT			
	Oral/NG	IV	SC		Urine	Bowels/Stoma	Vomit	Total
0000		30ml		30ml				
0100		30		60				
0200	Sips	30		100	90			90
0300		30		130			100	190
0400		30		160				
0500		30		190				
0600		30		220	75			265
0700		30		250				
0800	Cup of tea	30		480	40			305
0900		30		510				
1000		30		540				
1100	Cup of tea	30		700				
1200		30		730			250	555
1300		30		760				
1400		30		790	65			620
1500		30		820				
1600		30		850				
1700	1/2 water jug	30		1080				
1800		30		1110				
1900		30		1140	85			705
2000		30		1170				
2100		30		1200				
2200		30		1230				
2300		30		1260	105			810
Balance								+ 450ml

You look through the notes and find that the SHO responsible for the patient has organized a number of tests, but has failed to look at the results of them because they were not back by the time his shift ended.

Parameter	Result (reference range)
Plasma urea	22mmol/l (2.5-7.5)
Plasma creatinine	195µmol/l (50-120)
Urine sodium concentration	12mmol/l (<20)
Urine:plasma osmolality	2:1 (>1.5:1)
Urine:plasma urea	16:1 (>10:1)
Fractional excretion of filtered sodium	0.1% (<<1%)
Urine volume	600ml in last 24 hours (750-1500ml)

[i] From the data given, from what medical condition is the patient suffering?

- [a] glomerulonephritis
- [b] acute tubular necrosis
- [c] prerenal uraemia
- [d] fluid overload
- [e] diabetes insipidus

[ii] What treatment should you instigate immediately?

- [a] thiazide diuretic
- [b] loop diuretic
- [c] demeclocycline
- [d] fluid challenge
- [e] ddAVP

[iii] The following are indications for urgent dialysis in acute renal failure (ARF) except...

- [a] creatinine >300 (normal range 70-120 μ mol/l)
- [b] symptomatic uraemia
- [c] pulmonary oedema
- [d] severe acidosis
- [e] significant hyperkalaemia

[iv] What test is often diagnostic in cases of diabetes insipidus?

- [a] dexamethasone suppression test
- [b] insulin tolerance test
- [c] water deprivation test
- [d] synacthen test
- [e] urea & electrolytes

[8] A 59-year old plumber attends your GP practice complaining of increasing shortness of breath on exertion. He is a lifelong non-smoker. His oxygen saturations on room air are 87%. You order a CXR...



[i] A particularly obvious feature of this X-ray is...

- [a] pleural plaques
- [b] dextrocardia
- [c] old TB
- [d] lung cancer
- [e] mesothelioma

On auscultation you find fine end-inspiratory crepitations.

[ii] What next test is most appropriate?

- [a] bronchoscopy and biopsy
- [b] spirometry
- [c] MRI thorax
- [d] thoracoscopy and biopsy
- [e] sputum microscopy/culture/sensitivity specifically looking for acid-alcohol fast bacilli

[iii] If spirometry was done at some stage of his investigation...

- [a] it would be of no use whatsoever
- [b] it would demonstrate intrathoracic obstruction
- [c] it would demonstrate extrathoracic obstruction
- [d] overall, the picture would be restrictive
- [e] overall, the picture would be obstructive

[iv] Which comment is correct?

- [a] pleural plaques occur synchronously with exposure to asbestos
- [b] pneumoconiosis arises due to asbestos exposure
- [c] risk of developing mesothelioma is increased by smoking
- [d] progressive massive fibrosis is associated with exposure to asbestos
- [e] pleural plaques are not precursors of malignant change

[9] A 29-year old Somalian asylum seeker presents to A&E with increasing dyspnoea on exertion, unproductive cough and night sweats. She has an SpO₂ of 95% on room air, which drops to 89% on room air with exercise. On examination, there are some vaguely enlarged lymph nodes in the axillae and inguinal regions. Her chest sounds quite clear, though her respiratory rate is 25. You perform an ABG on room air...

SYNERGY ABG
01/02/2006 14:46

pH 7.449
pCO₂ 3.5 kPa
pO₂ 7.3 kPa
HCO₃ 20.9
SpO₂ 92.3%
Base Excess -1.4
Lactate 1.1

[i] What does the ABG show?

- [a] type II respiratory failure
- [b] respiratory acidosis
- [c] respiratory alkalosis
- [d] lactic acidosis
- [e] type I respiratory failure

[ii] What should you do next?

- [a] Chest X-ray
- [b] Administer low molecular weight heparin for PE
- [c] Administer standard iv antibiotics for community acquired pneumonia
- [d] Administer high flow oxygen
- [e] Perform urgent CT-pulmonary angiogram to exclude PE

At some point in the proceedings, the patient undergoes a CXR...



[iii] What is the likely diagnosis from the CXR?

- [a] Staphylococcal pneumonia
- [b] Right mid-zone pneumococcal pneumonia
- [c] Pericardial effusion
- [d] Pneumocystis carinii pneumonia
- [e] Toxoplasmosis

[iv] What is the optimal treatment?

- [a] iv flucloxacillin and benzylpenicillin
- [b] cotrimoxazole
- [c] pericardiocentesis
- [d] valgancyclovir
- [e] iv amoxicillin and clarithromycin

[v] If the same patient had presented with a history as above with additional massive haemoptysis and a CXR as shown below, what would your chest diagnosis change to?

- [a] aspergilloma
- [b] bronchial carcinoid
- [c] pneumocystis carinii pneumonia
- [d] mycobacterium avium intracellulare
- [e] toxoplasmosis



[10] You are asked to perform some spot diagnoses...

The chap below presents to A&E following a car crash. His blood pressure is 190/110. His BM is 12.



[i] To diagnose this patient's disease I would perform...

- [a] oral glucose tolerance test
- [b] intravenous glucose tolerance test
- [c] subcutaneous glucose tolerance test
- [d] insulin tolerance test
- [e] random cortisol

[ii] Other useful investigations would include (3 marks)...

- [a] muscle biopsy
- [b] EEG
- [c] MRI pituitary fossa
- [d] EMG
- [e] Tinel's test
- [f] formal assessment of visual fields
- [g] sweat sodium concentration
- [h] edrophonium test
- [i] thyroid ultrasound
- [j] barium enema

The following chap presented to his GP complaining of weight gain and thirst.



[iii] What would be your first test?

- [a] Synacthen test
- [b] oral glucose tolerance test
- [c] ECG
- [d] 24 hour urinary free cortisol
- [e] high dose dexamethasone suppression test

[iv] What would you expect to find on his urine dipstick?

- [a] glucose ++
- [b] ketones ++
- [c] nitrite ++
- [d] protein ++
- [e] bilirubin ++



[v] Which of the following statements are correct?

- [a] This patient will be thyrotoxic
- [b] Thyroid ultrasound scanning will show a hot nodule
- [c] This patient is at risk of myxoedema madness
- [d] This patient is at risk of pretibial myxoedema
- [e] Radioiodine treatment is not an option because of the age of the patient