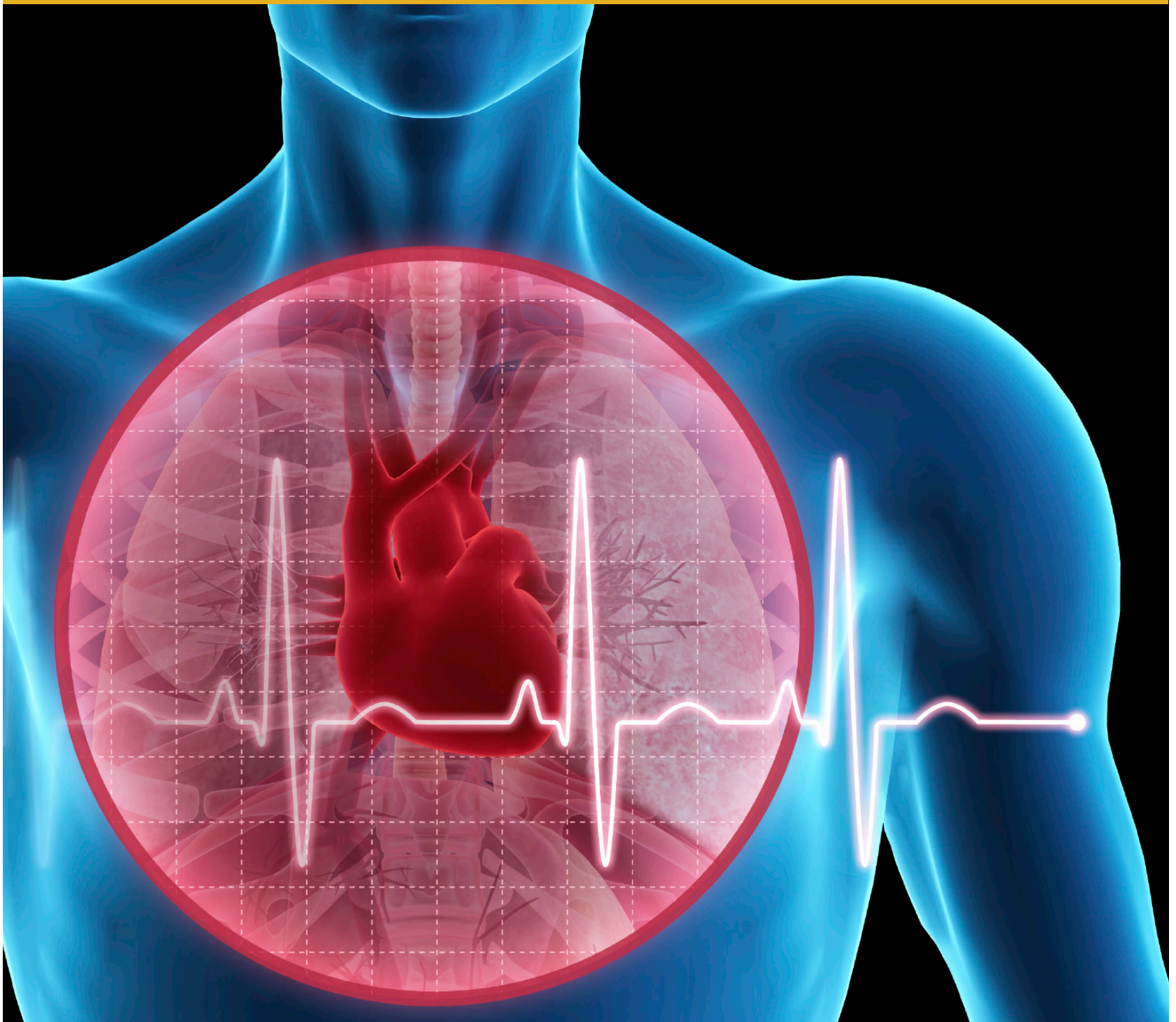


FOUNDATION YEARS JOURNAL

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Volume 5, Issue 5: Neurology

Foundation Years Journal is the ONLY journal for Foundation Years doctors and educators, specifically written according to the MMC curriculum. It focuses on one or two medical specialties per month, each issue delivers practical and informative articles tailored to the needs of junior doctors. The Journal closely follows the Foundation Years syllabus to provide the best educational value for junior doctors. In addition to good clinical and acute care articles, assessment questions give junior doctors the chance to gauge their learning. The answers will be published in the next issue, but 123Doc will advance answers to clinical tutor subscribers so they can engage their students in the learning process. Each issue provides comprehensive clinical cases for trainees as well as practical teaching assessments for educators. Readers will benefit from:

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Editorial For Neurology Issue Of Foundation Years Journal 2011

Many persons like to hold a book or journal in the hand. The ability to browse by turning pages, for those to annotate, who are prepared to deface paper copies to read without needing to find electronic apparatus to enable viewing (whether by computer, by Kindle device or otherwise), all are powerful stimuli to keep to conventional hard copy, paper publications. The feel of a book, the smell of the paper (maybe the binding), the colourful printing, and the variations in font and style all contribute to this sensual experience. However, paper copies become dated and cannot easily be amended except in loose-leaf form where, they lose much of their aesthetic appeal. They are more expensive to produce at the point of the user. They decay with use, whether aided by fingers, thumbs or by mice, and they are bulky for publishers and readers to transport. Hence, this trends towards electronic publishing. Electronic journals have many advantages and can be accessed from computers worldwide. This journal offers all of these advantages and on this occasion brings to readers aspects of important neurological topics relevant to Foundation Years practitioners.

The neurosciences, of which, everyday clinical neurology forms a part, have made amazing progress over the last couple of decades. The interactions between laboratory and clinical research, and with clinical medicine that deals with illness in patients at its most elementary level, have contributed to these advances. However, sometimes research and cutting edge thinking from the laboratory is difficult to apply to some of the immediate clinical problems exhibited by patients. Common sense (whatever that is) and thinking is needed with acute problems and so is rapid decision making. Some of the topics covered in this issue deal with acute medicine, and neurology is now very much part of this since nearly one fifth of those admitted acutely have neurological problems, and others with less acute matters still get admitted to hospital. Papers published here express some of the most important points that Foundation Years doctors experience during their everyday duties, lessons they wish to share with others in order to help prevent mishaps.

Indeed, such practitioners are encouraged to submit to this journal. There is so much to be learned from our everyday activities and our patients are in many ways our best teachers, using their symptoms and signs to make us think. It is in many ways a moral imperative to share this information with others and to publish for the widest circulation. Specific lessons that may be drawn from the papers in this issue of the Foundation Years Journal, include epilepsy and the causes of blackouts together with some useful tips on the use of the EEG in diagnosis, an important supportive test in some patients. Stroke is now an emergency in more ways than previously (since more can be done), a brain attack that needs handling acutely and which can result from venous sinus thrombosis, two more areas covered in this journal. The techniques of lumbar puncture are still important although much that was investigated previously by this technique now is revealed by the increasingly complicated imaging processes that have become available.

Acute neuromuscular weakness is a further presenting feature that has many causes and this condition may be quite puzzling in many patients. Increasingly complicated drugs and drug regimes may lead to toxicity, an important cause of disability that can easily be overlooked; baclofen is a useful drug for spasticity and intoxication is disabling. Trigeminal neuralgia can be treated in many ways; not all being effective and a paper on this topic should help guide those who deal with its early manifestations.

And what of that imperative to publish? Here we are guided in the values of clinic letters and of the role of the doctor as educator. All very important stuff, hopefully interesting, certainly enlightening, and without doubt we hope a stimulus for readers to provide further papers dealing with the many topics in neurology that may perplex all of us including those working in the Foundation Years.

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SYSTOLIC HYPERTENSION

O Thomas

Systolic Hypertension. Good Clinical Care.

Assessment and management of a patient presenting with newly discovered isolated systolic hypertension.

Abstract

Systemic hypertension is very common amongst adults, and is a major risk factor for cardiovascular events. Isolated systolic hypertension is the most common variant in the elderly, making up sixty percent of the cases in this age group. This case demonstrates the assessment of a patient presenting with newly diagnosed isolated systolic hypertension; including a full history, examination, routine investigations and grading of cardiovascular risk. Management is based on a combination of lifestyle measures, in this case followed by drug treatment. For introduction of medication a step-wise algorithm is used, aiming to combine drugs in the most logical way to maximise the fall in blood pressure. Systemic hypertension requires lifelong follow up and the majority of patients will need combinations of medications to adequately treat the condition.

Case History

A 72 year old caucasian female Mrs. T. attended her GP surgery for a routine medication review. An opportunistic blood pressure was taken. Her sitting BP was 174/84. She returned to see the Practice Nurse two weeks later when her blood pressure was 170/86, and was then seen several weeks later again by her GP. Her BP remained raised at 170/82.

History taking revealed she was only taking levothyroxine with no over the counter medications. There was no history or family history of renal disease and no history of any vascular disease. There were no symptoms to suggest secondary hypertension. She smoked ten cigarettes daily, drank five units alcohol per week and felt despite not specifically exercising she was busy around the house.

Mrs. T.'s father had died of a myocardial infarction aged 75 years and her mother had developed type 2 diabetes in her 6th decade.

Examination revealed a normal general appearance; with pulse, jugular venous pressure and heart sounds all normal. Her chest was clear, with no renal bruit and no radio-femoral delay. Fundoscopy was normal. An ECG showed no evidence of left ventricular hypertrophy or cardiac disease. Urine for dipstick was negative for blood or protein. Her BMI was 30.4 kg/m².



Blood tests showed creatinine 75 (range 44-80), estimated GFR 72 ml/min/1.73m², glucose 5.3 (range 3.0-6.0), total cholesterol 6.0, LDL cholesterol 2.9, HDL cholesterol 1.0, cholesterol/HDL 6.0.

A Q-risk score was obtained showing her 10 year cardiovascular event risk was 33%. It was decided there were no grounds for arranging ambulatory blood pressure monitoring.

Mrs. T. was therefore diagnosed with grade 2 isolated systolic hypertension (ISH).

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Blood Pressure		
Optimal	<120	<80
Normal	<130	<85
High Normal	130-139	85-89
Hypertension		
Grade 1 (mild)	140-159	90-99
Grade 2 (moderate)	160-179	100-109
Grade 3 (severe)	≥180	≥110
Isolated systolic hypertension		
Grade 1	140-159	<90
Grade 2	≥160	<90

Table 1 - Classification of hypertension by the British Hypertension Society

As with all patients with hypertension, lifestyle measures were given as first line treatment. She was advised to increase her exercise to 30 minutes daily, change her diet to include more fruit and vegetables, less salt, and lower her calorie intake aiming to reduce her weight towards ideal. She was referred to a local exercise referral scheme and also was referred to the dietician for further advice.

Mrs. T. was started on amlodipine 10mg, and because her 10 year cardiovascular risk score was more than 20% (high risk), then she was eligible for cholesterol lowering medications and consideration of aspirin. Aspirin was initially not started because the systolic blood pressure was over 150 mmHg, but Mrs. T. subsequently declined aspirin after discussion of the risks of gastric ulceration. She was happy to start on a statin, and therefore simvastatin was started at 40mg daily.

Mrs. T. was reviewed two months later. Her blood pressure on two readings was 155/78. As her blood pressure was not adequately controlled, it was decided to add a second medication and ramipril was chosen.

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Ramipril was started at 1.25mg at night to reduce the chance of postural hypotension. Urea and electrolytes were checked 10 days following introduction and these were normal. Mrs. T. was reviewed two weeks following this and her blood pressure was 146/76. However, she had developed a significant unexplained dry cough. Ramipril was substituted with losartan which was started at 50mg daily. After one more month her blood pressure was 138/76. As this was under the treatment target level she was asked to remain on the combination until her medication in six months time. In the meantime it was arranged to check her liver function tests and a repeat fasting lipid profile.

Discussion

This case shows a fairly typical presentation of hypertension in general practice, involving a patient with isolated systolic hypertension.

With increasing age, arterial stiffness tends to cause a continued increase in systolic pressure with a slight decline in diastolic pressure Figure 1. Therefore about 65% of hypertension in the elderly is ISH and is more common in women¹. It is clear that ISH is a major risk factor for cardiovascular disease, and treatment of this is significantly beneficial in reducing events². The SCOPE study showed a relative risk reduction for stroke of 27.8% in the treatment group overall compared to placebo, but post-hoc analysis showed the ISH group had a 42% reduction³. Clinicians have often been wary of treating blood pressure in the elderly due to concerns about side effects, but the HYVET study has shown that treatment in elderly populations reduces cardiovascular events with no increase in adverse effects or all cause mortality.⁴

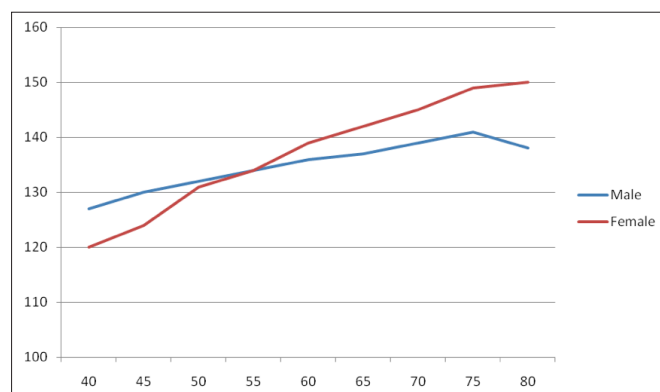


Figure 1 - Trend of systolic blood pressure with age¹¹

Assessment of a patient presenting with hypertension is aimed at:

- Confirming the hypertension and its severity
- Excluding potentially reversible causes (secondary hypertension)
- Grading overall cardiovascular risk
- Treating towards a defined target

Patients with a high blood pressure should only rarely be started immediately on treatment, and the diagnosis should be confirmed over at least two visits a month apart (more urgently if severe hypertension).⁵

History taking and examination are often forgotten parts of a hypertensive assessment, but remain vitally important to find potentially treatable cases of secondary hypertension (prevalence 9% in one large study)⁶ or target organ damage (TOD). This example shows a brief history and cardiovascular examination which should be done around the time of diagnosis. Following this assessment routine tests are advised by the British Hypertension Society (BSH), which again aim to screen for secondary hypertension or TOD.

- Urine dipstick for protein or blood (suggests renal parenchymal disease)
- Serum creatinine and electrolytes (baseline as medications may affect and also shows renal disease (raised creatinine/low eGFR) or suggests secondary hypertension (hypokalaemia))
- Blood glucose – ideally fasted (shows diabetes)
- Blood lipid profile – ideally fasted (allows cardiovascular risk to be qualified)
- Electrocardiogram (suggests left ventricular hypertrophy)

Box 1 - Routine investigations in hypertension¹²

If there are strong pointers towards secondary hypertension then further tests or specialist referral may be needed.

- Young patients (<40 years or especially <30 years age)
- Resistant hypertension
- Severe/malignant hypertension
- Family history stroke under 50 years age

Box 2 - Features suggestive of secondary hypertension¹³

1. Drugs – Non-steroidal anti-inflammatories, oral contraceptives, corticosteroids, liquorice, sympathomimetics
2. Renal disease – Any history or family history renal disease, abnormal dipstick, palpable kidney
3. Renovascular disease – History or risk factors vascular disease, abdominal/loin or other arterial bruit
4. Pheochromocytoma – Paroxysmal symptoms (headache, sweating, palpitations, pallor (not usually flushing), nausea, tremor, weakness, anxiety)
5. Conn's syndrome – Tetany, muscle weakness, polyuria, hypokalaemia

Box 3 - Symptoms and signs suggestive secondary hypertension¹³

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1. Aldosterone:renin ratio for primary hyperaldosteronism – Conn's syndrome (>750 – aldosterone in pmol/l and renin in ng/ml/h with aldosterone >400 pmol/l)
2. 24 hour urinary-free catecholamines for Pheochromocytoma (sensitivity 86%, specificity 88%), plasma more sensitive but availability limited
3. Magnetic resonance imaging for renal artery stenosis (sensitivity and specificity >90%) – angiography now only for therapeutic procedure or difficult cases as more invasive
4. Dexamethasone suppression test or 24 hour urinary-free cortisol for Cushing's syndrome

Box 4 – Suggested further investigations in suspected secondary hypertension¹⁴

The use of ambulatory monitoring is increasing although there is still a lack of evidence as to what levels to treat using home values. It is not necessary or practical to check this for every patient, and its use should be restricted to certain situations, such as suspected white coat hypertension.

Grading overall cardiovascular risk is important. There are two systems in use currently – the JBS 2 charts (found in the back of the British National Formulary) and the Qrisk calculator. The JBS 2 data is derived from the Framingham Study whereas the Qrisk score is based on data from over one million patients with data collected from General Practice. It claims to grade risk more closely with British patients and consists of more variables compared to the JBS 2 charts. The Qrisk score tends to grade 10 year cardiovascular risk lower overall, but with a higher average risk for women and ethnic minority groups – both underrepresented in the original Framingham study. This calculator is found at <http://qrisk.org/>

Patients with a previous history of cardiovascular disease or diabetes are automatically considered as high risk and a calculation of their risk is not indicated.



As in the case above patients with hypertension should be offered lifestyle treatments as first line. This normally will require a significant lifestyle change for many patients, and so should be reinforced with written advice and help sought from other practitioners (e.g. dietician). The PREMIER trial which reported in 2003 showed that behavioural intervention which included dietary change was significantly better in treating mild hypertension compared to standard advice only⁷.

Drug treatment should be started if:

- Blood pressure is consistently over 160/100 (either value)
- The blood pressure is over 140/90 (either value) and
- There is established cardiovascular disease or diabetes mellitus
- There is any evidence of target organ damage
- The 10 year risk (calculated as above) is over 20 percent

The target usually set at 140/90, although the BHS suggests 150/90 as a minimum target. Lower targets are usually set for patient with diabetes (130/80) and chronic kidney disease (125/75) due to data from trials supporting increasing benefit from lower blood pressure in these groups.

Statins should be added if the 10 year risk is over 20 percent with total cholesterol over 3.5 mmol/l, and aged up to 80 years; and aspirin if the 10 year risk is over 20 percent, or TOD is present or there is diabetes mellitus – but only if the blood pressure is controlled to under 150/90 mmHg.

Currently drug treatment is guided in the U.K. by the A(B)-CD algorithm Figure 2 initially supported by the BHS, but now also adopted by NICE. This is based on the finding that in younger patients with hypertension (under 55 years) the disease is more likely to be driven by the renin-angiotensin system, whereas in older and Afro-Caribbean patients the pathogenesis is related to vascular tone. Beta-blockers have been dropped as first line treatment over the last few years as it has been shown they give less protection against vascular events except in patient with a history of coronary heart disease⁵.

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Class of drug	Specific indications	Caution	Compelling contraindications
α blockers	Benign prostatic hypertrophy	Postural hypotension, heart failure	Urinary incontinence
ACE Inhibitors and A2RA's	Heart failure, diabetic nephropathy, secondary stroke prevention, chronic kidney disease, left ventricular hypertrophy	Renal impairment, peripheral vascular disease (PVD)	Pregnancy, renovascular disease
β blockers	Coronary heart disease, heart failure (specific types only)	Heart failure, PVD	Asthma, COPD, heart block
Calcium channel blockers (non-rate limiting)	Elderly, ISH, Angina		
Calcium channel blockers (rate-limiting)	Elderly, angina	Combination with β blockers	Heart block, heart failure
Thiazide diuretics	Elderly, ISH, heart failure, secondary stroke prevention		Gout

Figure 2 - ABCD Algorithm for introduction of antihypertensive medications¹²

For a reduction in systolic BP of 10mmHg or diastolic BP of 5mmHg on average there is a:

- 22 percent reduction in coronary heart disease events
- 41 percent reduction in strokes⁸

It has been shown that the risk reduction is mainly related to blood pressure reduction rather than a class effect^{8,9}. However, there are some differences, and there are some indications for one particular drug over another.

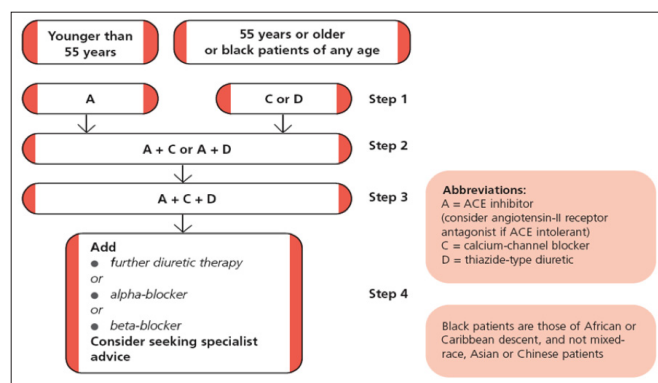


Table 2 - Specific indications and contraindications for antihypertensive drugs. Adapted from 12.

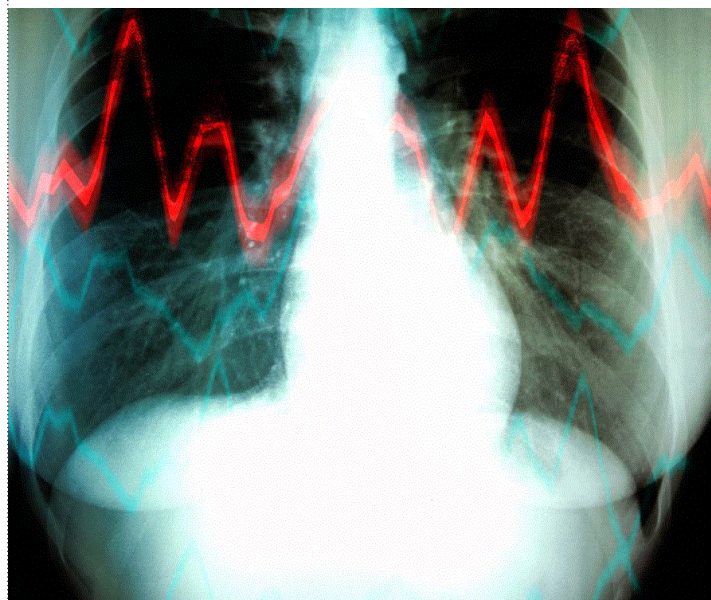
The patient in the example was started on drug treatment as her systolic was above 160, and amlodipine was chosen as it is one of the first line treatments in her age group, is particularly good for ISH, and her family history of diabetes made thiazide diuretics less attractive. There is a concern about raised blood sugars with thiazide diuretics¹⁰, and there is a particular risk of developing diabetes when combined with beta-blockers.⁵

The target for Mrs. T. was set at 140/90, and if monotherapy doesn't achieve this target (as in most patients eventually⁸), then further drugs should be added until at target. Ramipril was chosen in her case as ACE inhibitors are generally cheaper than angiotensin 2 receptor antagonists (A2RA) but are generally felt to have similar effects. The disadvantage can include a persistent cough which leads to discontinuation in about 15 percent taking ACE inhibitors, but doesn't include A2RAs, as these don't cause an increase in serum bradykinin concentration which is thought to be responsible for the cough. It is important to check urea and electrolytes 1-2 weeks following each dose increase of an ACE inhibitor or A2RA, as renal failure can occur in patients with bilateral renal artery stenosis, and hyperkalaemia can also occur.

Follow up of patients should be at least annually, but in the authors practice we tend to see patients six monthly to check compliance, side effects, etc.

5 Take Home Messages

1. Isolated systolic hypertension is the commonest type in the elderly, and is strongly associated with vascular events.
2. Treatment of hypertension in the elderly has been found to be beneficial with no significant increase in adverse effects overall.
3. History and a full cardiovascular examination is recommended to look for any predisposing causes of hypertension, or evidence of organ damage from raised blood pressure.
4. Treatment of a raised blood pressure includes lifestyle measures in all cases, with stepped drug treatment based on age, sex and ethnicity – treating towards a defined target.
5. Adjuvant treatment with lipid modifying drugs and aspirin depends on the level of cardiovascular risk over the next ten years – for which there are two main systems of calculation.



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Questions

1. A 28 year old female with no family history of hypertension presents with severe hypertension. Her potassium is 3.6 (ref range 3.5-5.0), sodium 144 (range 135-145), with a normal creatinine and urinalysis. The following statement is true concerning investigation of her hypertension.

- i. A normal serum potassium makes primary hyperaldosteronism very unlikely
- ii. Adrenal adenomas are commonly an incidental finding on abdominal CT scanning
- iii. Renal artery stenosis is very unlikely given her age and sex
- iv. Flushing significantly increases the likelihood of pheochromocytoma
- v. If there are features of Cushing's disease, a short synacthen test would confirm this diagnosis

2. A 65 year old male with history of exertional breathlessness is found to have hypertension. His other past medical history includes mild mitral regurgitation and gout. His BMI is 32. The best initial choice of antihypertensive would be:

- i. Atenolol
- ii. Doxazosin
- iii. Amlodipine
- iv. Diltiazem
- v. Bendroflumethiazide

Answers

1. Correct answer ii.

Adrenal adenomas are commonly incidental finding on CT scan, and hyperaldosteronism should only be diagnosed with appropriate biochemical tests. Most cases are related to bilateral hyperplasia rather than an adenoma. Only one third of patients with hyperaldosteronism have frank hypokalaemia – the remainder often have low-normal levels. Fibromuscular dysplasia is a more common cause of renal artery stenosis than atherosclerosis in young patients, particularly females. Flushing is seldom found in pheochromocytoma, pallor being a much more common symptom. A short synacthen test is for assessment of cortisol deficiency, a dexamethasone suppression test or urinary cortisol is needed for diagnosis of Cushing's disease



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2. Correct answer – amlodipine.

As his age is over 55 years, then a calcium channel blocker or thiazide diuretic is usually first line. As he has gout this makes a thiazide diuretic unsuitable. Exertional breathlessness and mitral regurgitation may herald heart failure which would make a rate limiting drug such as diltiazem unsuitable. Atenolol would also be unsuitable for this reason and is not used as first line unless there is pre-existing coronary heart disease. Doxazosin is again not normally used as first line, and has been shown in the ALLHAT study to have a higher risk of heart failure than other drugs. Amlodipine is therefore the most ideal drug from this list.

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References

1 Kannel WB Prevalence and implications of uncontrolled systolic hypertension, *Drugs Aging*, 2003; 20 (4) :277-86

2 Curb JD, Pressel SL, Cutler JA, et al. Effect of antihypertensive treatment on cardiovascular disease risk in older diabetic patients with isolated systolic hypertension, *JAMA*, 1996 Dec 18; 276(23) : 1886-92

3 Papademetriou V, Farsang C, Elmfeldt D, et al. Stroke prevention with candesartan in elderly patients with isolated systolic hypertension: the Study on Cognition and Prognosis in the Elderly (SCOPE), *J Am Coll Cardiology*, 2004 Sep 15; 44 (6):1175-80

4 Beckett NS, Peters R, Fletcher AE, et al. Treatment of hypertension in patients 80 years of age or older (HYVET), *N Engl J Med*, 2008 May 1; 358 (18):1887-98

5 Hypertension: management of hypertension in adults in primary care, National Institute of Clinical Excellence <http://www.nice.org.uk/nicemedia/pdf/HypertensionGuide.pdf>

6 Omura M, Saito J, Yamaguchi K, et al, Prospective study on the prevalence of secondary hypertension among hypertensive patients visiting an outpatient clinic in Japan, *Hypertens Res*. 2004 Mar; 27(3):193-202

7 Appell LJ, Champagne CM, Harsha DW, et al. *JAMA*, 2003 Apr 23-30; 289 (16):2083-93

8 ALLHAT research group, Major outcomes in high risk patients randomised to angiotensive converting enzyme inhibitor or calcium channel blocker vs diuretic: The ALLHAT trial, *JAMA*, 2002 Dec 18; 288 (23): 2981-97

9 Law MR, Morris JK, Wald NJ, Use of blood pressure lowering drugs in prevention of cardiovascular disease: meta-analysis of 147 randomised trials. *BMJ*, 2009 May 19; 338: b1665

10 Barzilay JI, Davis BR, Cutler JA, et al, Fasting glucose levels and incident diabetes mellitus in older adults randomised in the ALLHAT study, *Arch intern Med*. 2006 Nov 13; 166(20):2191-201

11 Kannel WB. *Am Heart J* 1999; 138: s205

12 Williams B., Poulter N., Brown. M, et al. British Hypertension Society guidelines for hypertension management 2004 (BHS-IV): summary, *BMJ* 2004; 328:634-40

13 Hammer F, Stewart P, Investigating hypertension in a young person, *BMJ* 2009; 338:b1043

14 Stewart P, *Endocrine Hypertension, Medicine* 2009; 37(8): 391-440

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“OH, BY THE WAY DOCTOR” SYNDROME

A Abu-omar

“Oh, By The Way Doctor” Syndrome. Professionalism In Practice.



Introduction

Doctors frequently explore a patient problem before determining the full spectrum of the patient's concerns. They often redirect the patient's initial description of concerns. This leads to incomplete initial description and raises the chance of late-arising concerns and missed opportunities to gather potentially important data. Uncovering the patient's agenda from the outset takes little time, yields important data and improves the efficiency of the consultation. The authors of this article spent some time in General Practice during their foundation training. They aim, through this article, to share their experience with trainees in General Practice and help them solicit the patient's hidden agenda early in the consultation to avoid the above “syndrome”.

Setting the agenda

The clinical interview between the doctor and patient is the core activity of clinical practice. Whilst identification of the reason for the patient's visit is a key objective of the consultation, doctors commonly fail to achieve this. As a result, patients report that they were unable to express and discuss their concerns. Let us look at the following example:

Doctor: It seems that your cough is due to a viral infection. You are in no need for antibiotics. This should resolve on its own.

Patient: Thanks, doctor. Oh by the way, just before I leave, there is one more thing I would like to mention to you.

Doctor: Yes?

Patient: For the past few weeks, I have been passing blood intermittently in my bowel motions.

This is a prime example of what would happen if the practitioner explores the first problem the patient mentions before knowing all the patient's worries. It is recognised that patients, if given the opportunity, have an average of 3 concerns per office visit.^{1,2} Therefore, a defective interview technique can prevent the doctor from eliciting the patient's entire agenda early in the visit.³ The physician should attempt to listen and not interrupt the patient until all concerns have been mentioned.

A productive approach is the use of open-ended questions such as “What else?”, “What other problems do you want us to attend to today?”, “What else did you want to accomplish here today?”, “Other than problems x, y and z, what else did you want to be sure we begin to address today?”, “What else did you need to have taken care of today?”⁴

Once the agenda is clarified, the physician and patient should work together to prioritise the list and negotiate which parts will be dealt with that day. The patient of course might demand resolution of an issue which does not appear to be of high priority to the doctor. Therefore, the doctor should agree with the patient which items to cover and which to postpone.

Why do we fail to elicit the patient's agenda?

- **Listening and understanding:** These 2 acts are of paramount importance. Unfortunately, doctors sometimes fail to demonstrate to their patients that they have indeed listened and understood.
- **Interruption:** Physicians commonly redirect and focus clinical interviews before giving patients the opportunity to complete their statement of concerns. Marvel et al showed that even accomplished family practitioners interrupted their patients an average of 23 seconds into the interview and often prevented patients from fully voicing their initial symptoms.⁵
- **Time pressure:** Physicians may spend less time eliciting the patient's agenda, hoping to face a single issue and believing that the sooner they begin the problem work-up the better. In fact, just the opposite happens! Failure to comprehend each other's goals is a frequent cause of a dysfunctional consultation that ends up requiring more time.
- **Hidden agenda:** Doctors assume that patients will begin the consultation with the most pressing problem. In reality, the opposite is true. Thus, the physician should ask for a complete list of concerns to unravel the hidden agenda. He should not take the patient's first-voiced concern as the most important one.

“OH, BY THE WAY DOCTOR” SYNDROME

A Abu-omar

Key factors for establishing the agenda

Doctors should always attempt to cover the following salient questions in order to identify the agenda for the visit:

- 1 - What are the patient's main concerns for today?
- 2 - What are the clinician's concerns about the patient?
- 3 - What are the patient's specific requests?
- 4 - How much of the patient's or the doctor's concerns need to be addressed today, and which ones or parts of ones can be deferred to a subsequent visit?
- 5 - What disagreements about priorities exist, if any, and how will they be negotiated?

Conclusion

“Oh, by the way Doctor” syndrome frequently occurs at the end of the interview but has its origin at the beginning. Doctors should share responsibility for agenda setting with patients to allow them to feel respected as participants in that process. In addition, soliciting the patient's agenda at the start of the consultation has a significant impact on establishing an efficient, fruitful and well-organised consultation.

References

- 1 Stewart M, Brown J, Levenstein J, McCracken E, McWhinney IR. The patient-centred clinical method. 3. Changes in residents' performance over two months of training. *Fam Pract* 1986; 3:164-167.
- 2 Kaplan SH, Gandek B, Greenfield S, Rogers W, Ware JE. Patient and visit characteristics related to physicians' participatory decision-making style. Results from the Medical Outcomes Study. *Med Care* 1995; 33:1176-1187.
- 3 White J, Levinson W, Roter D. “Oh, by the way ...”: the closing moments of the medical visit. *J Gen Intern Med* 1994; 9:24-8.
- 4 Baker LH, O'connell D, Platt FW. “What else?” Setting the agenda for the clinical interview. *Ann Intern Med* 2005; 143:766-70.
- 5 Marvel MK, Epstein RM, Flowers K, Beckman HB. Soliciting the patient's agenda: have we improved? *JAMA* 1999; 281:283-7.



“Oh, By The Way Doctor” Syndrome.
Professionalism In Practice.

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CARDIAC COMPUTERISED TOMOGRAPHY SCANNING & MAGNETIC RESONANCE IMAGING

H Du Preez, E N Smith and O Rider

Cardiac Computerised Tomography Scanning & Magnetic Resonance Imaging. Good Clinical Care.

Abstract

Non invasive cardiac imaging is becoming increasingly fundamental to the diagnosis and management of heart disease. Several imaging modalities exist. This article will focus on two; cardiac magnetic resonance imaging and cardiac computed tomography. Although we do not discuss echocardiography and nuclear imaging, all the advanced non invasive cardiac imaging modalities have their strengths and weakness and no single modality is currently able to supply all the information required to treat heart disease. Indeed, in many scenarios they can be considered to be complementary. These case-based discussions examine two individuals who required investigation with advanced cardiac imaging. We discuss the rationale for the respective imaging modalities employed, the indications and contraindications for each, and their relevance to patient management.

Case 1: Cardiac Magnetic Resonance Imaging (CMR)

Case History

On the background of a 'flu-like' illness, a 32 year old male builder presents to A&E with a 12 hour history of severe central chest pain, and shortness of breath. He has not experienced any previous episodes and has no significant prior medical or surgical history. He takes no regular medications and is a non-smoker. On examination he is afebrile, blood pressure is 120/70 and pulse is 100 bpm. The remainder of the cardiovascular system examination was unremarkable.

What initial investigations are mandatory in this case?

The patient has a chest x-ray which reveals no abnormalities and an ECG which demonstrates PR segment depression but no other significant findings (see figure 1). Blood tests reveal CRP 85, ESR 50, and Troponin T of 4.5 (normal <0.1). Full blood count, clotting, and urea and electrolytes are otherwise normal.

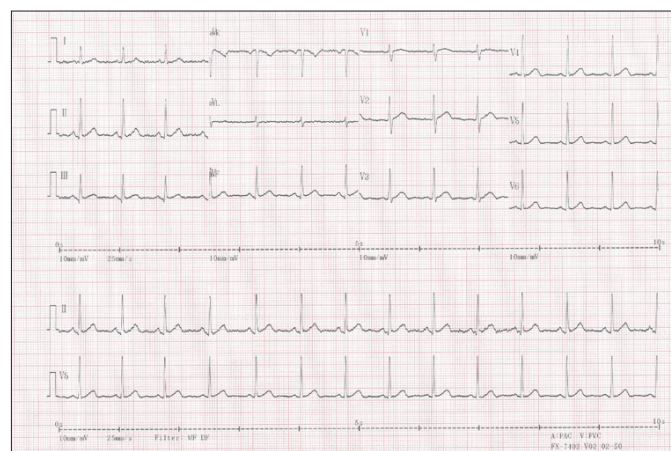


Figure 1. ECG showing minor PR segment depression but no other abnormality

What possible pathologies does the ECG suggest?

PR segment depression indicates atrial injury and can be a feature of myocarditis, post peri-cardiotomy syndrome and acute pericarditis, where it is usually accompanied by global ST elevation. The ECG does not exclude a non ST elevation myocardial infarction.

What is the differential diagnosis?

The presence of chest pain, a preceding 'flu like' illness and a strongly positive troponin makes the most likely differential either pericarditis or myocarditis but it is crucial to exclude acute coronary syndrome.



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What are the causes of a raised Troponin?

Cardiac	Non-cardiac
Myocardial infarction	Pulmonary embolism
Coronary Spasm	Critically ill patients
Tachyarrhythmia	Renal failure
Heart failure	Strenuous exercise e.g. marathon running
Myocarditis / Myopericarditis	High dose chemotherapy
Takotsubo Cardiomyopathy	Vasculitis – SLE/Churg Strauss.
Hypertrophic Cardiomyopathy	Subarachnoid Haemorrhage
Dilated Cardiomyopathy	Envenomation i.e. scorpion bite
Cardiac contusion	Shock
DC cardioversion / ICD shocks	Air/fat/cholesterol embolism
Cardiac Surgery	
Percutaneous Coronary Intervention	
Radiofrequency Arrhythmia Ablations	
Post Cardiac Transplantation	
Electrocution	

Table 1. Causes of a raised Troponin

The patient underwent urgent coronary angiography but was found to have normal coronary arteries. Echocardiography showed normal left ventricular function with no regional wall motion abnormality.

What would you do next?

A cardiac magnetic resonance (CMR) scan was performed and the diagnosis of myocarditis was made (Figure 2). The patient was managed with supportive measures and made a full recovery. Viral titres confirmed exposure to Coxsackie virus, which, along with adenovirus, are the most common precipitants of myocarditis in Europe.

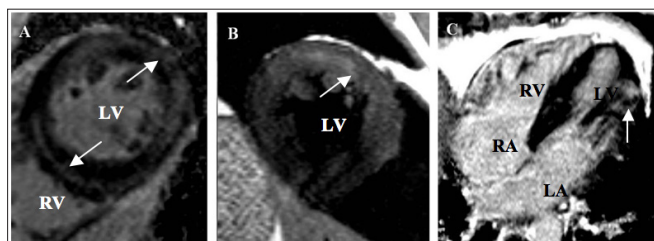


Figure 2. (A) A short axis image of the left ventricle showing late gadolinium enhancement (white arrow) in the mid wall of the left ventricle (black), suggestive of myocarditis. (B) Corresponding increased signal (white arrow) on T2 STIR images suggesting myocardial oedema. (C) A Horizontal Long Axis (four chamber) image of the heart showing patch late enhancement in the mid wall of the left ventricle (white arrow).

How does CMR work?

CMR uses powerful magnetic fields to create accurate and reproducible cine images of the heart irrespective of body habitus. Data acquisition is synchronised with the cardiac and respiratory cycles through ECG gating and breath-hold technology. CMR obviates the need for 2D geometric assumptions necessary for echo analysis and avoids the use of ionizing radiation. As such it is now considered the gold standard for the functional assessment of the left and right ventricle. In addition the ability of MR to image in any axis plane is extremely helpful in congenital cardiac imaging, and aortic imaging, where traditional para-sternal and apical imaging planes of echo are often limited. Accurate flow imaging necessary for the assessment of valvular heart disease and intracardiac shunts (ASD, VSD) is also now possible with CMR.

A further major advantage of CMR is its capacity for tissue characterization using late intravenous gadolinium contrast imaging and T1 or T2 weighted imaging. Gadolinium binds to scar or inflammation. When bound it changes the physical properties of scar or oedema by shortening the T1 relaxation. This allows normal myocardium and scarred/fibrosed or oedematous myocardium to be separated with T1 weighted imaging. Normal myocardium appears black, scarred/fibrosed or oedematous myocardium looks white. Different diseases show different patterns of gadolinium enhancement allowing improved diagnostic accuracy (Figure 3).

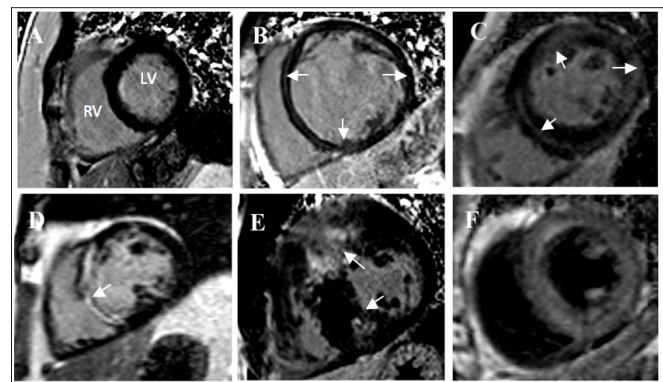


Figure 3. Patterns of Late Gadolinium Enhancement (A) Normal Heart where myocardium is black throughout, (B) Dilated Cardiomyopathy – thinned dilated LV with mid-wall enhancement (arrow), (C), Myocarditis – mid wall patch enhancement, (D) Myocardial Infarct with endocardial enhancement, (E) Hypertrophic Cardiomyopathy – enhancement in the LV/RV junction and the greatest areas of LV thickness, (F) Amyloidosis – diffuse uptake throughout the myocardium.

CMR is the Gold Standard for the following :

- Characterization of cardiac masses
- Assessment of congenital heart disease
- Assessment and differentiation of cardiomyopathies and infiltrative disease
- Assessment of left and right ventricular volumes, mass and ejection fraction and serial assessment of disease

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CMR is also useful for the following:

- Assessment of myocardial viability and perfusion
- Quantification of intra/extra cardiac shunt flows
- Monitoring of aortic pathology, e.g. dilatation, giant cell arteritis or coarctation. However, use is limited as CMR is unsuitable for imaging in an acute situation. This is due to the high magnetic fields and consequent difficulty of bringing resuscitation equipment to the patient.
- Non invasive measurement of Iron overload in transfusion dependant populations, i.e. haemoglobinopathies

What are the strengths and weaknesses of CMR?

Strength	Weakness
<p>No exposure to ionizing radiation.</p> <p>Imaging NOT limited to orthogonal planes of view (this is particularly advantageous in imaging congenital or complex anatomy).</p> <p>Yields high resolution pictures irrespective of body habitus and unlike echo, is not dependent on adequate acoustic windows.</p> <p>Unlike all other imaging modalities, CMR allows tissue characterization (e.g. T1 & T2 weighted images for oedema/inflammation, T2* for myocardial iron content and late gadolinium enhancement used to show scar tissue post myocardial infarction. Early gadolinium enhancement is useful in determining clots).</p> <p>CMR is highly reproducible and therefore suitable for serial imaging.</p> <p>Compatible with several of the newer pacemaker models.</p>	<p>The commonly available field strengths are currently insufficient for assessment of coronary arteries.</p> <p>Synchronization of data acquisition with cardiac and respiratory cycles means suboptimal images will be obtained if patient unable to breath-hold e.g. because acutely unwell, or has an irregular heart beat e.g. atrial fibrillation.</p> <p>Poor at assessing the aorta in the acute setting.</p> <p>Expensive</p> <p>Association of gadolinium contrast with Nephrogenic Systemic Fibrosis in patients with advanced renal failure (GFR under 30ml/min).</p>

Table 2. Strength and weaknesses of CMR

What are the absolute contraindications to CMR?

- Patients with ferrous metal implants or residual ferrous metal in the body (shrapnel, road traffic accident injury)

What are the relative contraindications to CMR?

- GFR of less than 30 (ml/min) due to the potential risk of Nephrogenic Systemic Fibrosis.
- Claustrophobia
- Certain pacemakers are not safe to be used with MRI but several of the newer models are designed to be compatible

Why was CMR the most appropriate investigation in this case?

CMR can differentiate between the causes of troponin positive chest pain with normal coronary arteries e.g. distinguishing between myocarditis and embolic NSTEMI, and thus allows appropriate treatment to be started. In addition CMR prevents the need for further invasive procedures e.g. endomyocardial biopsy which has a high rate of false negative results given the patchy nature of myocarditis.

What was the patient's post discharge management?

Myocarditis predisposes to the development of dilated cardiomyopathy and therefore the patient was subject to serial monitoring with CMR and monitored for signs of heart failure.

Case 2: Cardiac Computed Tomography scanning (CT)

Case History

A 45 year old accountant presents to his GP complaining of an episode of chest pain which sounds typically like angina, arising on exertion and settling on rest. He has never smoked, and is normotensive, normocholesterolaemic and not diabetic. He does however have a strong family history of ischaemic heart disease with a brother and father both having myocardial infarcts in their mid 40's. He is investigated with a full Bruce protocol exercise ECG test and achieves 6 minutes and 30 seconds with indeterminate ST changes.

What other non-invasive tests are available to diagnose coronary artery disease?

In view of the fact that he is of low/intermediate risk of ischaemic heart disease a cardiac CT coronary angiography scan is undertaken as it avoids the small, but significant risks of invasive coronary angiography.

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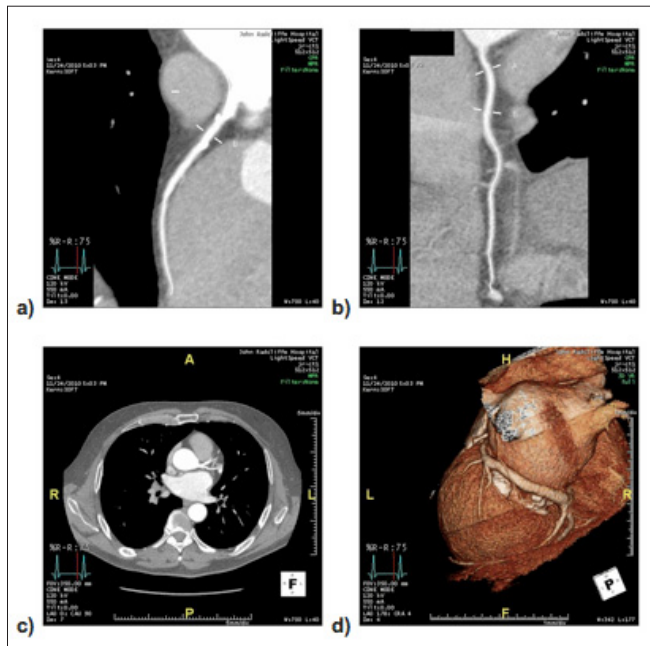


Figure 4. (a and b) Clear views of the coronary arteries showing no stenosis, (c) A transverse slice showing the bifurcation of the left mainstem coronary artery and (d) a 3D rendering of the left circumflex coronary artery.

How does Cardiac CT work?

Cardiac CT uses a large series of two-dimensional X-ray images taken around a single axis of rotation around the heart to generate 2D and 3D images of the native coronary arteries and, if present, coronary bypass grafts. Like CMR cardiac CT is a minimally invasive test. However, unlike CMR, it can be performed quickly but carries the inherent risks of ionizing radiation i.e. it is associated with an increased risk of cancer. Patients with heart rates greater than 60 beats per minute may also require beta-blockade as acquisition of data occurs in diastole. Cardiac CT uses iodinated intravenous contrast (typically 100 cc) which can be nephrotoxic.

Coronary CT angiography is useful in patients classed as low-to-intermediate risk of ischaemic heart disease risk to exclude obstructive coronary artery disease. It has a unique advantage over stress echo and myocardial perfusion scanning in that it can differentiate those patients with little or no atheroma from those that have substantial coronary artery disease that is not yet obstructive. Aberrant coronary arteries can also be well visualized on CT.



What are the principle uses of Cardiac CT?

- Coronary artery calcium scoring
- Diagnosis and assessment of coronary artery disease
- Assessment of coronary artery bypass grafts
- The assessment of anomalous coronary arteries

What are the strengths and weaknesses of Cardiac CT?

Strengths	Weakness
Assessment of coronary arteries	Higher radiation exposure compared to CMR, however doses of radiation are significantly lower on the Cardiac CT latest equipment
Fast method of Imaging	
Relatively safe in the acute setting	Risk of acute kidney injury with intravenous contrast.
Compatible with permanent pacemakers	CT assessment of ventricular function usually requires higher doses than coronary only protocols, but is dependent on type of CT scanner
Less limited by claustrophobia	

Table 3: Strengths and weaknesses of Cardiac CT

How does Cardiac CT assess coronary artery disease?

A correlation has been noted between the amount of calcium in the coronary arteries and the likelihood of coronary artery disease. Thus coronary calcium scoring is useful in assessing the amount of calcified coronary atherosclerotic plaque and predicting future coronary events in asymptomatic patients. It cannot however determine whether the plaques are limiting blood flow and may not detect non calcified plaques.

What are the contraindications to Cardiac CT?

- Allergy to intravenous contrast
- Poor renal function

How did Cardiac CT effect the patient's management?

CT coronary angiography demonstrated that the patient had normal coronary arteries and therefore he could be reassured that his pain was non cardiac in nature while avoiding the risks associated with invasive angiography.

Test Yourself Questions:

1. Which of the following drugs may be required to optimize coronary CT images?

- Beta-blockers
- Adrenaline
- Calcium channel antagonists
- ACE-inhibitors
- Noradrenaline

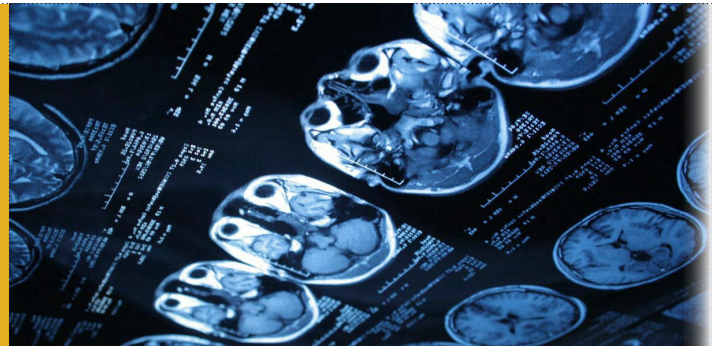
2. Which one of the following statements is TRUE with respect to cardiac CT?

- Cardiac CT has the ability to image in all planes of view
- It is possible for patients with permanent pacemakers to undergo cardiac CT imaging
- Cardiac CT may be limited by patients who suffer from claustrophobia
- Intravenous CT contrast is linked to nephrogenic systemic fibrosis
- Cardiac CT is not suitable for use in an acute setting

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3. Which one of the following statements is TRUE with respect to CMR?

- a) CMR is the preferred imaging modality to rule out aortic dissection
- b) CMR is the gold standard in investigation of coronary artery disease
- c) Early Gadolinium enhancement is used to identify scar tissue post myocardial infarction in CMR
- d) CMR is ideal for serial imaging because of its highly reproducible nature
- e) CMR is one of the cheaper cardiac imaging modalities

Answers

1. Correct answer (a).

Coronary CT image acquisition is performed during diastasis (the end of the cardiac cycle where the myocardium is relatively still). At higher heart rates diastasis is shorter and the window for image acquisition is smaller. Beta-blockers have a negative chronotropic effect, slowing the heart rate and increasing the length of diastasis and the window for imaging. A heart rate of around 60 beats per minute is the aim, to achieve optimal image quality and minimise radiation exposure.

2. The answer is (b) because cardiac CT can be safely used in patients with permanent pacemakers. Cardiac MRI is able to image in all planes, risk of acute kidney injury with intravenous contrast. Patients who suffer from claustrophobia tolerate CT better than CMR as the scanner bore is larger. It is the Gadolinium which is present in MRI contrast, not CT contrast, which is associated with nephrogenic systemic fibrosis. MR is less suitable for acutely unwell patients because the magnetic field prevents resuscitation equipment being kept in proximity, CT does not have this restriction.

3. The correct answer is (d). CMR is less suitable than CT for the imaging of acute aortic pathology because, although excellent at imaging the aorta, the CMR suite is an environment unsuitable for resuscitation equipment. Commonly available CMR field strengths are currently insufficient for assessment of coronary arteries. Late Gadolinium enhancement is used in the detection of scar tissue post myocardial infarction. CMR is one of the comparatively more expensive imaging modalities.

References

1. British Heart Foundation Fact-file. Cardiac Imaging with MRI, CT and Nuclear Techniques. URL: <http://www.bhf.org.uk/idoc.ashx?docid=c20c3469-9517-4ce1-a9a2-a42aa4812632&version=-1> (accessed 22nd January 2011).
2. Springings D, Chambers J. Acute Medicine: A Practical guide to the management of medical emergencies. 4th ed. Oxford: Blackwell publishing; 2008.
3. Camm AJ. Myocardial and endocardial disease. In: Kumar P, Clark M (eds.) Clinical Medicine. 5th ed. Bath: Elsevier; 2002. p 809 – 815.
4. Lin E, Kelpac S, Sammett E. Cardiac MRI-Technical Aspects Primer. URL:www.emedicine.medscape.com/article/352250-overview (accessed 23rd January 2011).
5. British Heart Foundation Fact-file. Cardiac Imaging with MRI, CT and Nuclear Techniques. URL: <http://www.bhf.org.uk/idoc.ashx?docid=c20c3469-9517-4ce1-a9a2-a42aa4812632&version=-1> (accessed 22nd January 2011).
6. British Heart Foundation Fact-file. Cardiac Imaging with MRI, CT and Nuclear Techniques. URL: <http://www.bhf.org.uk/idoc.ashx?docid=c20c3469-9517-4ce1-a9a2-a42aa4812632&version=-1> (accessed 22nd January 2011).
7. British Heart Foundation Fact-file. Cardiac Imaging with MRI, CT and Nuclear Techniques. URL: <http://www.bhf.org.uk/idoc.ashx?docid=c20c3469-9517-4ce1-a9a2-a42aa4812632&version=-1> (accessed 22nd January 2011).
8. British Heart Foundation Fact-file. Cardiac Imaging with MRI, CT and Nuclear Techniques. URL: <http://www.bhf.org.uk/idoc.ashx?docid=c20c3469-9517-4ce1-a9a2-a42aa4812632&version=-1> (accessed 22nd January 2011).
9. British Heart Foundation Fact-file. Cardiac Imaging with MRI, CT and Nuclear Techniques. URL: <http://www.bhf.org.uk/idoc.ashx?docid=c20c3469-9517-4ce1-a9a2-a42aa4812632&version=-1> (accessed 22nd January 2011).
10. Mahabadi AA et al., Safety, efficacy, and indications of beta-adrenergic receptor blockade to reduce heart rate prior to coronary CT angiography. Radiology. 2010 Dec;257(3):614-23.
11. Kalra PA. Essential Revision Notes for MRCP. 3rd ed. London: Pastest; 2009.
12. Patel PR. Lecture Notes in Radiology. 3rd ed. Singapore: Blackwell; 2010.

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SURVEY PAPER

F Shivji, G Geary



Survey Paper. Training & Teaching.

Abstract

The Foundation Programme: Views from the current generation of Foundation Doctors in the Trent Deanery.

Introduction

The Foundation Programme (FP) is still in its embryological stage. This new way of training has many areas, which have come under scrutiny and debate. It was felt a survey was needed to gather as many thoughts and opinions so as to gauge what aspects of this FP are successful and what are thought to be less so.

Methods

A survey was created online and circulated via email to all 582 F1 and F2 trainees in the deanery. The survey was made available for 1 month (January – February 2010). Data was collected anonymously. The survey allowed a mixture of quantitative and qualitative data to be collected and analysed.

Results

122 Foundation Doctors responded (21% of trainees). 74% of trainees are 'pleased' with F1 and F2 being coupled at application. 72% of respondents felt that 2 years is the correct length for the Programme. 56% of respondents favour 4-month placements. 61% of FP doctors feel workplace assessments are 'unlikely' to identify potentially dangerous doctors. 55% of trainees feel that the current timing of applications for specialty training does not allow for an informed career choice.

Discussion

This survey provided an exploration of the views of current Foundation trainees. The majority of respondents favoured the length and consistency of the Foundation Programme. However, the usefulness of Work Based Assessments was questioned. It is hoped this will add to the knowledgebase used by FP evaluators and can be used as evidence to create the necessary changes to the FP in the future.

Article

The Foundation Programme: Views from the current generation of Foundation Doctors in the Trent Deanery.

Introduction

In 2002, the document Unfinished Business, written by the Chief Medical Officer, proposed the Foundation Programme (FP). This document stated that 'after graduating, doctors should undertake an integrated, planned, 2 year Foundation Programme of general training'. The following year, Modernising Medical Careers combined the thoughts outlaid in Unfinished Business with the new need to satisfy the demands of the European Working Time Directive and, more importantly, improve clinical care. In this way, the FP was put into practice with a 1-year pilot followed by full implementation in 2005.

The FP aims to structure Junior Doctors' (JDs) training to incorporate not just knowledge but generic core competencies explained in the GMC's Good Medical Practice. It allows JDs to experience at least 6 specialties over 2 years whilst constantly receiving formal feedback through Work Based Assessments (WBAs) and postgraduate education from a Foundation Curriculum.

Although in it's 5th year, The FP is still in its embryological stage. This new way of training JDs is multi-faceted, and therefore there have been many areas of it, which have come under scrutiny and debate. The Trent deanery has 582 F1 and F2 doctors training in it. As with every deanery, the Trent FP differs from slightly from others. From experiencing the day to day running of this FP first hand, it was felt a survey was needed to gather as many thoughts and opinions so as to gauge what aspects of this FP are successful and what are thought to be less so. The survey considers many aspects of the FP including the length of the programme, the role of supervisors, teaching, and WBAs.



SURVEY PAPER

F Shivji, G Geary

Overview

What is already known about the Foundation Programme

The Foundation Programme has been piloted successfully and has been implemented for 5 years. It is used to ensure all 1st and 2nd year doctors gain the core competencies and experience required to progress to specialist training.

What this survey adds

The majority of trainees believed the length of the programme and its attachments are suitable. The ePortfolio was thought of as a useful tool. Work Based Assessments are not thought to be likely to identify dangerous doctors. Educational supervision is of variable quality.

Suggestions for future research

Future studies should focus on individual parts of the FP in order to gain more detail into trainees understanding and attitudes towards these.

Methods

A deanery wide survey was conducted which included the following NHS Trusts:

- Lincolnshire Hospitals
- Nottingham University Hospitals
- Derby Hospitals
- Chesterfield Royal Hospital
- Sherwood Forest Hospitals

The survey creators (FS and GG) discussed the potential content with F1 and F2 representatives from the various hospital sites around the deanery. 'Hot topics' were identified which were the areas of the FP that it was felt were the most important to JDs. A selection of questions were created and arranged into a survey:

1. How long should the FP last?
2. How long should each attachment last?
3. How pleased are respondents with the local system of coupling F1 and F2 years?
4. What are the opinions of the system of swapping jobs in F2?
5. How easy is it to complete the required WBAs?
6. Do respondents think the assessments process is likely to identify dangerous doctors?
7. Does the timing of applications for specialist training allow for an informed career choice?
8. What are the thoughts on Educational and Clinical Supervision?
9. What are the thoughts regarding the ePortfolio?
10. What types of teaching are most useful?
11. What are respondents thoughts regarding the unavailability of study leave during F1?



The survey was created online and circulated via email to every F1 and F2 in the deanery (582). The email was accompanied with a brief explanation as to the nature of the survey. The survey was made available for 1 month (January – February 2010). Data was collected anonymously. The survey allowed a mixture of quantitative and qualitative data to be collected and analysed.

To analyse the qualitative data, a content analysis was conducted by the two authors of this survey (FS and GG). Both authors independently looked for common themes in the data. These were then discussed in order to reach an agreement of the underlying themes that best represented the data.

Results

A total of 122 JDs (21%) completed the survey. Quantitative data produced from each question was accompanied with various themes.

1. How long should the FP last?

72% of respondents felt that 2 years is the correct length for the FP. Most trainees prefer a 2-year programme as it gives a wide amount of experience:

'Gives enough time to experience medicine and surgery and become a rounded trainee'

'Any longer would delay career progression'

However, some trainees would still like a longer programme. The overriding reason for this is it would give a larger amount of time in which to decide on which specialty to choose for specialist training.

'At the moment, not enough time to experience specialties'

'Help with career choices'

'Increased chance to improve generic skills'

'Increased chance to build CV'

2. How long should each attachment last?

56% of respondents favour 4-month placements, with 25% favouring 6-month placements. 16% would like 3-month placements. The differing of opinions seems to be due to how sure one is of their future career choices. Those who are still undecided would prefer shorter attachments as it gives an opportunity to experience more specialties.

SURVEY PAPER

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Reasons for 3 months:

'Dr's will gain just as much experience as 4 months, but allows more specialties to be tried'

'Gain broader experience to help with career choices'

Reasons for 4 months:

'Enough time to get experience and basic skills'

'Allows 3 rotations in the year'

'Not too long if you hate it, enough time to get stuck in if you love it'

Reasons for 6 months:

'With shorter attachments by the time you feel confident, it is not long before you move to a new area'

3. How pleased are respondents with the local system of coupling F1 and F2 years?

In the East Midlands deanery, trainees chose both F1 and F2 locations and attachments at the same time whilst at University. This differs from the majority of other deaneries.

Interestingly, 74% of trainees are pleased or extremely pleased with the two years being coupled at application.

'Allows us to plan ahead, for example, where to live'

'Less stress of reapplying'

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4. What are the opinions of the system of swapping jobs in F2?

Another difference between the East Midlands and other deaneries is the ability to change jobs in F2 via a swapping system. This is done using an online forum where trainees can advertise their wishes to swap. The opinion of JDs is that the ability to swap is welcomed as many have changed their minds regarding particular specialties by the time F2 starts. However, it was clear that the online method of swapping jobs is too complicated and needs simplifying.

5. How easy is it to complete the required WBAs?

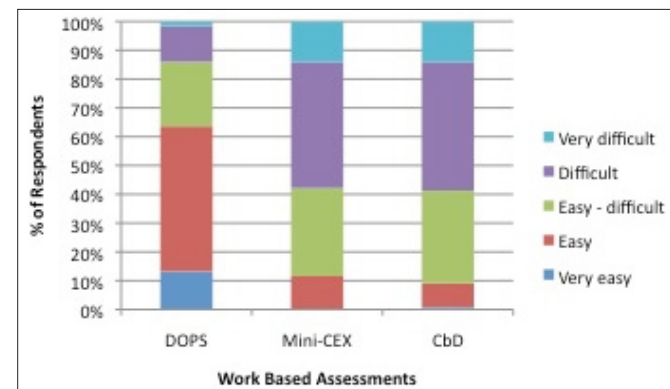


Figure 1: Graph showing the differences in the degrees of difficulty trainees experience when completing various WBA's

6. Do respondents think the assessments process is likely to identify dangerous doctors? 61% of FP doctors feel workplace assessments are unlikely or very unlikely to identify potentially dangerous doctors

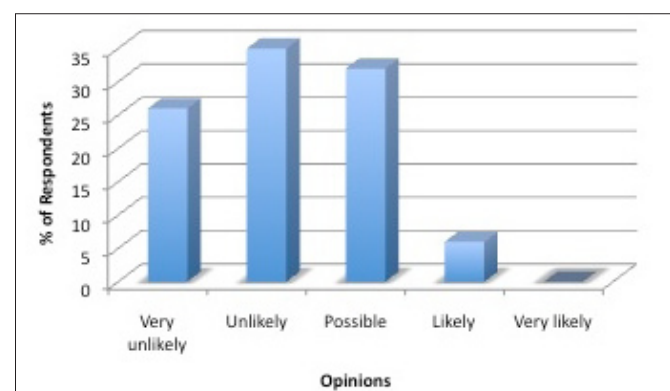


Figure 2: Graph showing trainees' opinions on the likelihood of WBA's identifying potentially dangerous doctors.

SURVEY PAPER

F Shivji, G Geary

7. Does the timing of applications for specialist training allow for an informed career choice?

This question invited a vast amount of comment from the respondents. 55% felt that the current timing of applications does not allow for an informed career choice to be made. Two main themes were drawn from this. Firstly, trainees commented that they would have only worked in 4 of their 6 placements when applications for specialty training are made. This may result in them not having worked in a potential career specialty before applying for it. Secondly, some JDs would like more time to decide on a career. It is unclear if these doctors would prefer applications being made at the end of F2 or would like a longer FP.

'I will have no experience of the specialty apart from that as a med student'

'The current system is set up purely for those who know what they want to do'

8. Thoughts on Educational and Clinical Supervision?

Trainees appear to feel confused as to the role of both supervisors. They feel they would benefit from education about the different roles at the start of the FP. Trainees also feel that some of their Educational Supervisors lack the knowledge of the FP and their own role in a JD's training. This is sometimes combined with a lack of enthusiasm from supervisors, which then devalues meetings. Some trainees feel having many meetings with both supervisors is unnecessary and time consuming.

Positives from supervision are good pastoral support offered by supervisors and dissecting feedback from WBAs. Of particular value are discussions regarding career choices with their tutees.

'In F1 my educational supervisor was brilliant, prompting me to explore different specialties, advising me on how to get the most of out my attachments and providing pastoral support. He also kept an eye on my portfolio making sure I was up to date. In F2 I've managed to meet with my educational supervisor only once. He has missed 3 other meetings.'

9. What are respondents thoughts regarding the ePortfolio?

The ePortfolio is a tool, which was too vast to truly assess using this survey. However, the brief thoughts offered by the respondents gave many positives. Having a ready-made template for a Portfolio allows trainees to have all there important documents all in one place. Trainees like being able to upload presentations and certificates and log reflections, procedures, and WBAs online. The 'easy to view' nature of the curriculum is also a positive. Improvements that would like to be seen are more guidance on the use of the Portfolio, for example, 'How many reflections to write? What procedures to document?'

10. How helpful do you find the following types of teaching?

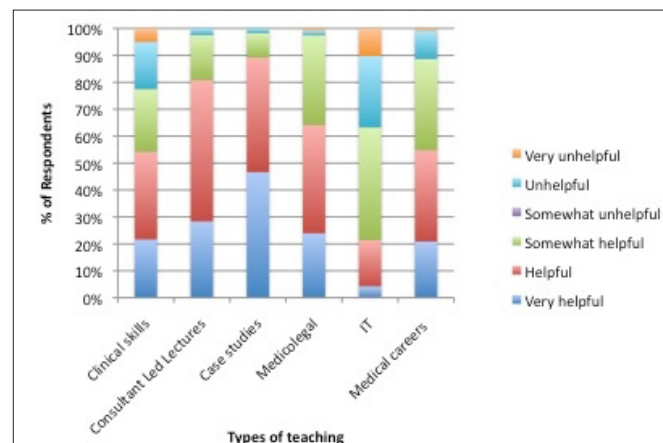


Figure 3: Graph showing trainees' preferred teaching methods.

11. What are respondents thoughts regarding the unavailability of study leave during F1?

To clarify, the Trent deanery does not allow F1s to undertake any study leave. F1s are allocated 1 hour of protected teaching per week in addition to a Simulation Training Day. Study leave allowance for F2s is used to fund the school's generic professional skills training programme. This funds attendance at a variety of taught courses including a Simulation Training Day in F2 year, as well as attendance at an Advanced Life Support and Windmills Career Management course during F2.

29% of JDs had specific problems with the lack of study leave. These problems have been detailed as a lack of ability to attend specific courses or take postgraduate exams. This had led to some trainees taking annual leave to undertake postgraduate education.

'Have to take annual leave, otherwise fall behind peers'

'Demearing that we cannot dictate what education is useful to us'

Discussion

This survey gauging the views and opinions of current Foundation doctors provided an invaluable insight into the successes and failures of the FP. It has not only highlighted particular areas of the generic programme, but it has also revealed areas where the Trent deanery has enhanced or failed to improve foundation training.

With focus on the generic programme, the majority of trainees agreed with a 2-year course consisting of 4-month attachments. The opinions were that this allows doctors to sample a broader range of specialties, which may be beneficial in making career choices. These views have been echoed in previous surveys (O'Brien et al, 2006).

SURVEY PAPER

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WBAs have become an integral part of the FP to give proof of competency and training. However, this survey showed that trainees view the usefulness of these assessments in judging doctors ability with some cynicism. The perception that WBAs and portfolio learning have 'little educational value' is not new and this survey seems to concur with this. A possible reason for the lack of interest in WBAs may be the assessor's attitude to them. Assessors can appear to treat WBAs as a 'tick-box' exercise, which then negates and restricts any useful formal feedback. This may be due to a lack of training in WBAs. There is also a risk of assessors fearing negative feedback may lead to a difficult working environment, which again discourages relevant assessment.

An important theme that was generated was of the timing applications for specialist training in relation to the F2 year. Trainees remarked that having to apply after only completing 4 out of 6 attachments leaves them choosing specialties that they are not completely sure they want to pursue. For applicants who are certain of a particular specialty, this timing obviously provides no problem. However, the majority of JDs' would prefer to have more experience before committing to a specialty. These views are understandable but it is unclear how this situation can be avoided when logistics are taken into account.

In contrast to O'Brien et al⁴, the respondents in this survey seemed disillusioned by educational and clinical supervision. It can be speculated that in O'Brien et al's⁴ pilot, supervision was explained fully to its trainees and only motivated supervisors were selected. In this survey, however, supervision seemed to be a mixed experience, as seen in the quote from one of the respondents. Education needs to be provided to trainees and supervisors, and enthusiastic supervisors must be selected. There is no doubt that the supervisors can be a useful resource if used correctly.

The ePortfolio appears to have been thought of as a useful tool for trainees. Once learnt how to use correctly, most JDs like the ability to log their progress in all areas of learning in one place.

The Foundation curriculum is extensive and each deanery must try to teach this curriculum according to the best of their ability. Respondents would like to experience case based discussions as their primary method of learning together with lectures that are Consultant led. Interestingly, there were a large proportion of respondents that would like Medico-legal teaching. This may reflect JDs' experiences of working in modern Medicine. A thought to improve teaching would be to engage Medical schools. This would allow higher quality teaching from those with qualifications in medical education. When analysing the improvements the Trent deanery has made to the FP, there has been a clear agreement that the coupling of the F1 and F2 years is a positive. JDs prefer being able to plan for 2 years rather than having to experience the uncertainty of reapplying for F2. The coupling of the years is made even more successful by the option of swapping attachments for F2. Other deaneries should learn from this that coupling with a suitable swap scheme gives trainees the most flexible FP and also allows for themselves and their families to plan ahead.



However, the decision of the deanery to prohibit trainees to select their own postgraduate study and use study leave is a problem for almost a third of JDs. It has forced many to use annual leave to continue postgraduate education. Prohibiting a free choice of how to use study leave does not allow trainees to pursue their own career pathways but restricts them and results in all the Foundation doctors completing generic training.

This survey has accumulated a vast amount of data regarding the majority of the FP. It is hoped this will add to the knowledgebase used by FP evaluators and can be used as evidence to create the necessary changes to the FP in the future. Unfortunately, in trying to collect a substantial amount of information, the survey used was extensive, and this may have led to a lower amount of trainees taking the time to complete it, which is a significant limitation of this study. In the future, a similar but more streamlined survey should be completed again. In order to increase the number of respondents, completion of the survey could be made mandatory for trainees.

Although in its embryological stage, the FP structure appears to be appreciated by JDs. However, due to its many facets, areas have been identified that still need improvement.

The Foundation Programme: Views from the current generation of Foundation Doctors in the Trent Deanery

References

1. Department of Health. Unfinished Business. London: HMSO, 2002
2. Department of Health. Modernising Medical Careers. London: HMSO, 2003
3. General Medical Council. Good Medical Practice. http://www.gmc-uk.org/guidance/good_medical_practice.asp
4. O'Brien M, Brown J, Ryland I, et al. Exploring the views of second-year Foundation Programme doctors and their educational supervisors during a deanery-wide pilot Foundation Programme. *Postgrad Med J* 2006 82: 813-816
5. Hrisos S, Illing J, Burford B. Portfolio learning for foundation doctors: early feedback on its use in the clinical workplace. *Medical Education* 2008; 42: 214-223
6. Carr S. The Foundation Programme assessment tools: An opportunity to enhance feedback to trainees? *Postgrad Med J* 2006; 82: 576-579

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CARDIAC REHABILITATION

C Smart and D Braganza



Cardiac Rehabilitation. Training & Teaching.

Cardiac Rehabilitation

Despite advances in primary prevention, pharmacological strategies, interventional and surgical revascularisation, cardiovascular disease remains a major cause of morbidity and mortality in the Western world. Improved surveillance, enhanced diagnostic techniques and prompt revascularisation where appropriate has undoubtedly helped to improve prognosis however this is only part of the story. Cardiac rehabilitation takes the process one step further and has been shown to both aid recovery and, by lifestyle and risk factor modification, to limit disease progression and reduce cardiovascular mortality in stable cardiac disease in a cost effective manner.

Cardiac Rehabilitation

Cardiac rehabilitation (CR) is a medically supervised, multidisciplinary programme designed to improve health and well being after a cardiac event by incorporating exercise, education and counselling techniques to help people return to an active life and prevent further cardiac episodes.

Although there are references as far back as Hippocrates extolling the virtues of exercise, the concept of CR stems from Hellerstein in the mid 1950's where a multidisciplinary approach to rehabilitation/early ambulation post cardiac event was adopted to prevent complications from the previously recommended 6 week prolonged bed rest¹. Modern CR is no longer just an exercise training programme but rather encompasses a range of lifestyle modifications in order to improve recovery, enable individuals to regain their pre-morbid status and effect changes to limit disease progression.

Cardiac Rehabilitation is a national priority

CR was identified as a goal for the 2000 National Service Framework for coronary heart disease². The initial aim was to offer rehabilitation for 85% of patients following an ischaemic event or cardiac revascularisation, however nationally uptake has fallen far short of this target with overall uptake in the region of 30% of eligible patients and marked geographical variations³. As such it is now the focus of a National NHS Improvement Plan and has led to a recent publication from the Department of Health (DoH)⁴ to both raise the profile of CR intervention and to help commission new services around the country. CR is acknowledged to be a cost effective strategy, second only to aspirin and beta-blockers in preventing future events in this population.

Key Objectives of Cardiac Rehabilitation

All members of the multidisciplinary cardiac rehabilitation team are essential in helping to achieve the key objectives of a cardiac rehabilitation programme as outlined in table 1. The composition of individual cardiac rehabilitation teams varies but typically includes or has access to a supervising physician, dietician, psychologist, qualified smoking cessation counsellor, physiotherapist, pharmacist, a British Association for Cardiac Rehabilitation (BACR) accredited exercise trainer and vitally a cardiac specialist rehabilitation nurse whose role has been shown to be pivotal in achieving referral rates and who has a central role in the execution and coordination of programmes^{5,6}.

Key Objectives of a Cardiac Rehabilitation Programme based on DoH ⁴	
1.	Reduced morbidity
2.	Improved health and well being <ul style="list-style-type: none"> a. Improved quality of life b. Reduced anxiety & depression c. Improved functional capacity & physical activity status d. Increased involvement in smoking cessation programmes
3.	Reduced number of acute readmissions due to secondary cardiac events & unplanned procedures
4.	Increased service uptake and access at all stages of the service

Table 1: Key Objectives of a Cardiac Rehabilitation Programme



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Target Populations

A wide variety of cardiac patients have been shown to benefit from cardiac rehabilitation however limitations in service provision have meant that in accordance with NICE guidance for secondary prevention (CG48), chest pain of recent onset (CG95), unstable angina and NSTEMI (CG94), priority to date has been for acute coronary syndrome patients irrespective of treatment modality, and in newly diagnosed heart failure patients, or those with a step change in clinical presentation (NICE CG5). As services develop (see table 2), it is envisaged that heart transplant patients, those undergoing device implantation (ICD, CRT) and patients post valve replacement will be offered cardiac rehabilitation routinely, with services eventually expanding to encompass all patients with a confirmed diagnosis of exertional angina⁴.

Populations suitable for Cardiac Rehabilitation	Populations excluded from Cardiac Rehabilitation
<p>Ischaemic Heart Disease</p> <ul style="list-style-type: none"> - Post Acute Myocardial Infarction (AMI) - Post revascularisation procedures including coronary artery bypass graft (CABG), percutaneous coronary intervention (PCI) - Stable Angina <p>Other Cardiac Conditions</p> <ul style="list-style-type: none"> - Newly diagnosed heart failure - Post valve replacement - Cardiomyopathy - Pre- and post-heart transplant <p>Other specified Interventions</p> <ul style="list-style-type: none"> - Automatic implanted cardiac defibrillator (ICD) - Left ventricular assist devices (LVAD) - Cardiac resynchronisation therapy (CRT) 	<ul style="list-style-type: none"> - Complex medical needs - Patients under 16 years of age - Unstable Angina - Unstable LV function

Table 2: Target Populations

Risk Stratification

Risk stratification in CR is essential and allows tailoring of the service to patients needs. It allows individual prescription of exercises and highlights those at risk of recurrence based on a patient's educational needs, psychological functioning, their functional capacity and whether traditional CR is appropriate. Patients who are at low or moderate risk typically undergo early rehabilitation.

The CR programme works by focusing on “core components” for risk factor reduction. It is able to achieve this through targeting areas such as exercise, education, risk factors, promoting behavioural changes, counselling and psychological support and drug therapy whilst working towards the goal of improved long term management by helping individuals to understand and take responsibility for their own health. The key strategies aimed at targeting risk factor reduction for cardiovascular disease as shown in figure 1.



Figure 1 – Diagrammatic reference for core components of the cardiac rehabilitation programme.

Cardiac Rehabilitation- Phases and Stages

Historically CR has been offered as a four phase approach with Phase I as the initial evaluation following a cardiac event, Phase II the early post-discharge period, Phase III a clinical supervised outpatient programme and Phase IV the long-term maintenance phase, also referred to as SIGN Stages 1-4 in the Scottish Intercollegiate Guidelines Network (SIGN)⁷. Recent guidance has expanded upon this with emphasis on patient identification and early assessment in order to improve referral rates into the programme and sustain motivation throughout the course⁴. There are now 6 recognised stages as shown in figure 2.

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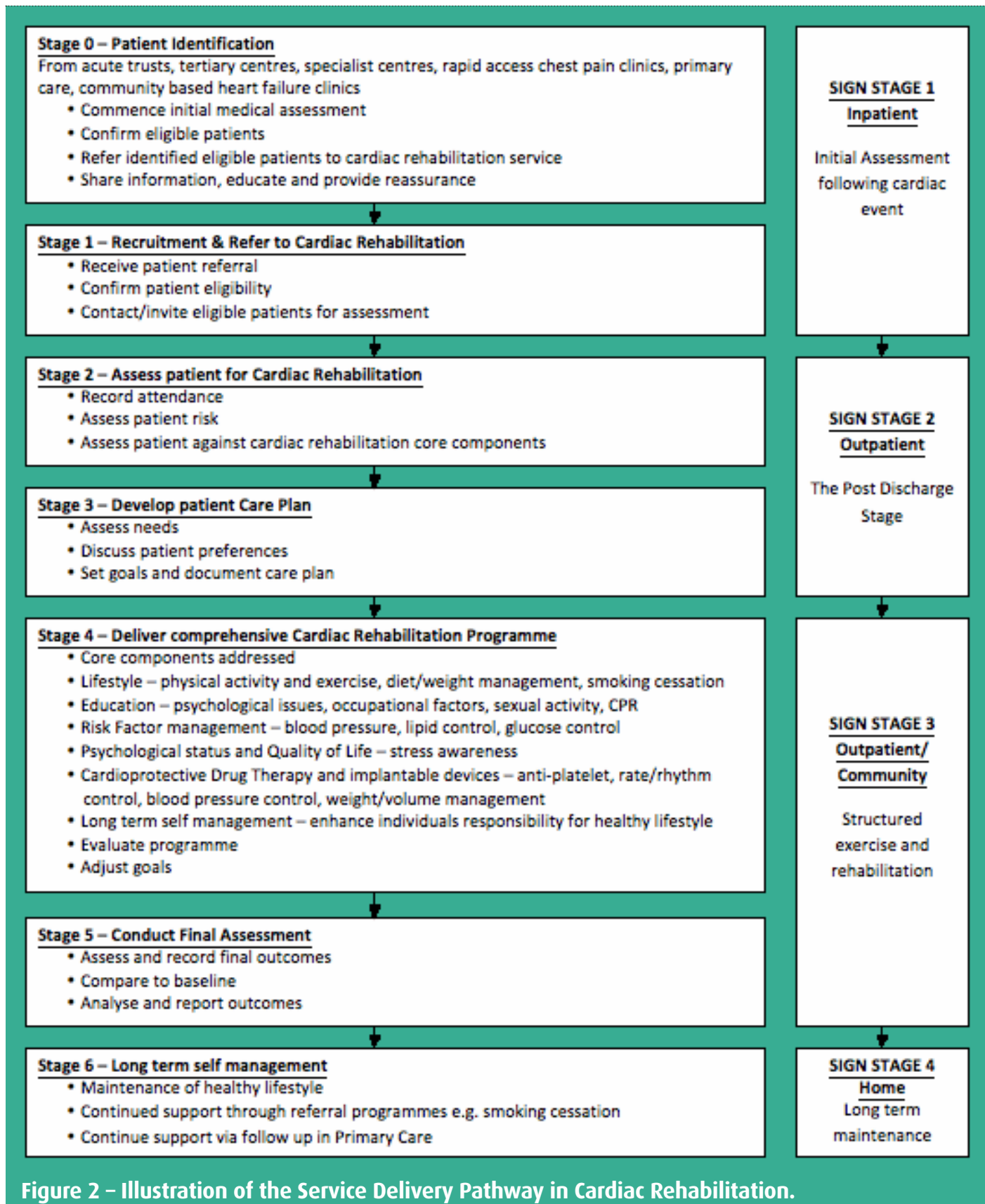


Figure 2 – Illustration of the Service Delivery Pathway in Cardiac Rehabilitation.

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At present referrals are often initiated from a hospital setting although with expansion of services, primary care referrals will no doubt increase. The aim is to enrol patients onto suitable programmes within 2 weeks of elective PCI, 6 weeks post surgical revascularisation or 4-6 weeks post primary PCI. The outpatient programme can be undertaken in a hospital setting, at home or in a community centre based environment (e.g. sports hall, local fitness club). Typically patients attend weekly or bi-weekly exercise classes for 6-8 weeks depending on the local provision. These sessions are tailored to the individual's circumstances and range from chair-based exercises to more vigorous activities. Fitness is assessed at the start of the course by a range of methods including questionnaires, shuttle walks, treadmill or cycle tests and then at the end to measure progress. Interaction with other patients at these sessions is found to be motivational and allows sharing of experiences and progress through the programme enhances patients confidence in the recovery process. Educational sessions underpin behaviour change and cover a range of topics including explanations of heart conditions, treatment strategies, healthy lifestyle advice, stress management, relaxation techniques and practical advice regarding flying and driving. This approach is not suitable for all and programmes such as the Heart Manual (www.theheartmanual.com) or the angina plan (www.anginaplan.org.uk) allow patients to follow a home-based programme with the support of a community outreach team instead. Whatever the method, the overall aim is to promote a restoration in physical, psychological and social functioning whilst supporting long term behavioural changes to enable patients to return safely to their everyday activities. This long-term maintenance is crucial and is the basis of the Chief Medical Officer's recommendation of 30 minutes of moderate intensity exercise at least five days a week on the background of an active lifestyle. The Harvard Alumni Study highlights that most benefit are gained from activity levels > 6 mets⁸.



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Benefits of Cardiac rehabilitation

The Cochrane review in 2000 and newer meta-analysis covering 48 multiple randomised controlled trials have found cardiac rehabilitation to be greatly beneficial for patients demonstrating an overall 20%-27% all cause mortality reduction in five years and around a 31% reduction in cardiac mortality in patients who undergo CR with an exercise training component compared with usual care^{9,10}. Interestingly, these trials did not show a statistical reduction in non-fatal MI, CABG or PCI between the groups although there were clear trends in this direction. This level of mortality benefit makes the intervention derived from effective CR comparable to the beneficial effects of statin therapy on cardiovascular mortality. CR has been shown to lead to improved exercise levels and benefit men and women of any age equally with very few complications, with the benefits being even greater in those with poor exercise tolerance by helping to increase myocardial perfusion¹¹⁻¹³. Amongst older patients CR has also been shown to aid functional independence and help with activities of daily living¹⁴.

Various hypotheses have been proposed as to the mechanism behind the mortality benefit seen with CR. Reduction in CRP levels, restoration of endothelial function, weight loss, improved BP profiles, beneficial effects on lipid levels and insulin sensitivity may all play a part¹⁵⁻¹⁸. Reductions in stress levels, anxiety and depression with improved psychosocial wellbeing have also been well documented¹⁹.

Safety of Cardiac Rehabilitation

Exercise therapy is beneficial in patients with cardiovascular disease (CVD) but like any intervention carries a risk especially in patients with undiagnosed ischaemia, arrhythmias and those with left ventricular dysfunction. As such the level of exercise for patients at higher risk should be tailored to that shown to be important in the risk stratification stage. Some studies have reported exercise therapy to trigger myocardial infarction and sudden death in patients with and without CVD. However that risk is significantly reduced if the patients had a more active lifestyle prior to participation²⁰.

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Exercise testing in unselected populations has a low mortality and low morbidity rate of < 0.01% and 0.05% respectively which increases to 0.03% and 0.09% within 4 weeks of an acute myocardial infarction. This translates to reported rates of complications during CR ranging from 1.23 to 2.88 and reported fatalities from 0.13 to 0.86 per 100,000 patient-hours^{21,22}. Some centres have tried to reduce these risks by commencing telemetry monitoring but this has been shown not to be better than standard medical supervision²³. It is important to remember that in some patients the risks of an active exercise programme may outweigh the expected benefits, hence the importance of initial risk stratification.

Current Issues with Cardiac Rehabilitation

Despite CR being shown to be beneficial in patients, the uptake remains suboptimal with high dropout rates³. There are many reasons for this including lack of referral, lack of motivation, distance to CR centre, dislike of working in groups, work or home related issues, ethnic or religious constraints, problems attending the hospital, car park charges and dislike of mixed classes. As such strategies addressing these issues need to be developed and potential suggestions are given in figure 3.

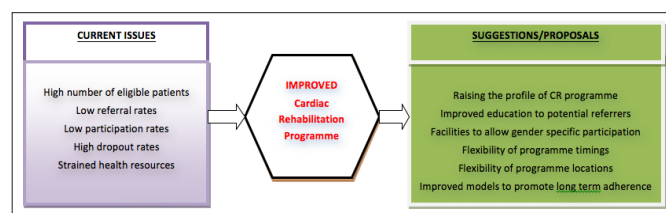


Figure 3 – Current Issues and areas of improvement in cardiac rehabilitation.

Summary

Cardiac rehabilitation has been shown to be an important part in the management of patients post cardiovascular event. It is vital to introduce the concept early after a cardiac event as this is when motivation is greatest and most likely to affect changes in behaviour leading to disease modification. Through education, exercise, stress management and lifestyle modification, cardiovascular morbidity and mortality is significantly improved. Regular exercise raises the threshold for ischaemia during exertion which potentially allows individuals to get back to independent living. Combining this with long term compliance to risk factor modification is a key goal in cardiac rehabilitation.

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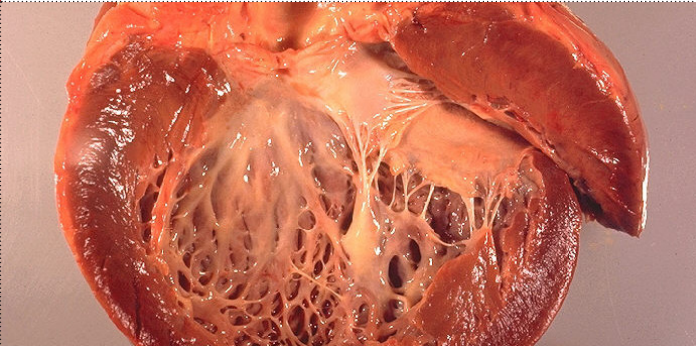
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References

- Bethell HJ. Cardiac rehabilitation: from Hellerstein to the millennium. *Int J Clin Pract.* March 2000;54(2):92-7
- Department of Health. Coronary Heart Disease National Service Framework (CHD NSF); Department of Health; 2000;1-32
- Bethell HJ. The Rise and Fall of Cardiac Rehabilitation in the UK. *J. Public Health* 2007;29(1):57-61
- Department of Health. Service Specification for Cardiac Rehabilitation Services. Department of Health. 2010
- Grange J. The role of nurses in the management of heart failure. *Heart.* 2005;May;91 Suppl 2:ii39-42
- British Association for Cardiac Rehabilitation (BCAR). Standards and Core Components for Cardiac Rehabilitation. British Association for Cardiac Rehabilitation. 2007;1-12
- Scottish Intercollegiate Guidelines Network (SIGN). Cardiac Rehabilitation – A National Clinical Guideline. SIGN. 2002;1-37
- Sesso HD, Paffenbarger RS Jr, Lee IM. Physical activity and coronary heart disease in men: The Harvard Alumni Health Study. *Circulation.* 2000; 102(9):975-80
- Jolliffe JA, Rees K, Taylor RS, Thompson D, Oldridge N, Ebrahim S. Exercise-based rehabilitation for coronary heart disease. *Cochrane Database Syst Rev* 2001;1:CD001800
- Taylor RS, Brown A, Ebrahim S, Jolliffe J, Noorani H, Rees K, et al. Exercise-based rehabilitation for patients with coronary heart disease: systematic review and meta-analysis of randomized controlled trials. *Am J Med.* 2004;116:682-92
- Cannistra LB, Balady GJ, O'Malley CJ, et al. Comparison of the clinical profile and outcome of women and men in cardiac rehabilitation. *Am J Cardiol.* May 15 1992;69(16):1274-9.
- Dugmore LD, Tipson RJ, Phillips MH, et al. Changes in cardiorespiratory fitness, psychological wellbeing, quality of life, and vocational status following a 12 month cardiac exercise rehabilitation programme. *Heart.* Apr 1999;81(4):359-66
- Linke A, Erbs S, Hambrecht R. Exercise and the coronary circulation-alterations and adaptations in coronary artery disease. *Prog Cardiovasc Dis.* Jan-Feb 2006;48(4):270-84
- Ferrara N, Corbi G, Bosimini E, et al. Cardiac rehabilitation in the elderly: patient selection and outcomes. *Am J Geriatr Cardiol.* Jan-Feb 2006;15(1):22-7
- Sarrafzadegan N, Rabiei K, Kabir A, et al. Changes in lipid profile of patients referred to a cardiac rehabilitation program. *Eur J Cardiovasc Prev Rehabil.* Aug 2008;15(4):467-72
- Bader DS, Maguire TE, Spahn CM, et al. Clinical profile and outcomes of obese patients in cardiac rehabilitation stratified according to National Heart, Lung, and Blood Institute criteria. *J Cardiopulm Rehabil.* Jul-Aug 2001;21(4):210-7
- Wilson K, Gibson N, Willan A, Cook D. Effect of smoking cessation on mortality after myocardial infarction: meta-analysis of cohort studies. *Arch Intern Med.* 2000;160:939-944
- Ades PA, Coello CE. Effects of exercise and cardiac rehabilitation on cardiovascular outcomes. *Med Clin North Am.* Jan 2000;84(1):251-65, x-xi
- Dugmore LD, Tipson RJ, Phillips MH, et al. Changes in cardiorespiratory fitness, psychological wellbeing, quality of life, and vocational status following a 12 month cardiac exercise rehabilitation programme. *Heart.* Apr 1999;81(4):359-66
- Mittleman MA, Maclure M, Tofler GH, Sherwood JB, Goldberg RJ, Muller JE. Triggering of acute myocardial infarction by heavy physical exertion. Protection against triggering by regular exertion. Determinants of Myocardial Infarction Onset Study Investigators. *N Engl J Med.* 1993;329:1677-1683
- Van Camp SP, Peterson RA. Cardiovascular complications of outpatient cardiac rehabilitation programs. *JAMA.* 1986;256: 1160-1163
- Franklin BA, Bonzheim K, Gordon S, Timmis GC. Safety of medically supervised outpatient cardiac rehabilitation exercise therapy: a 16-year follow-up. *Chest.* 1998;114:902-906
- Vongvanich P, Paul-Labrador MJ, Merz CN. Safety of medically supervised exercise in a cardiac rehabilitation center. *Am J Cardiol.* 1996;77:1383-1385

CARDIOMYOPATHY

A Jordan & F Witherow



Cardiomyopathy. Patient Management.

Abstract

This case based discussion explores the acute assessment of a 64-year-old man presenting with heart failure, followed by subsequent investigation and long-term management strategies for his underlying cardiomyopathy.

Case History

A 64-year-old man is referred to the medical assessment unit with several weeks of increasing difficulty in breathing and concurrent swelling of his lower limbs. During the night he woke suddenly feeling breathless, needing to rush to an open window to breathe fresh air.

• How would you approach the assessment of this patient?

• Which bedside investigation is of key importance in his early management?

As with all acutely unwell patients he should be assessed using the ABCDE approach, ensuring that he is clinically stable and that life-threatening conditions are treated promptly. In patients presenting with suspected heart failure, an ECG is essential early in the assessment. Myocardial infarction is a common precipitant of acute heart failure and timely specialist input will be necessary if there is an indication for emergency revascularisation.

Further assessment is based on tailored history, examination and investigation¹ to confirm the diagnosis of heart failure and determine the likely aetiology to allow instigation of acute and long-term treatment.

History

1) Presenting problem:

- How much activity provokes breathlessness? This will determine his New York Heart Association (NYHA) class (see table 1).
- Does he feel breathless lying flat? How many pillows does he sleep on?
- Explore the presenting symptom of paroxysmal nocturnal dyspnoea.
- Does he suffer from nocturnal cough (± pink frothy sputum) or nocturia (due to raised filling pressures when legs elevated)?
- Explore the timescale and extent of lower limb swelling. Ask about abdominal swelling.

- Any history of chest pain? Characterise the pain: is there a possible ischaemic cardiac aetiology?
- Has he suffered from palpitations or episodes of pre-syncope/syncope?
- Recent viral illness (suggesting myocarditis as a potential aetiology)?

NYHA Class	
I	No limitation of physical activity. Ordinary physical activity does not cause fatigue, palpitation, or dyspnoea.
II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnoea.
III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity results in fatigue, palpitation, or dyspnoea.
IV	Unable to carry on any physical activity without discomfort. Symptoms at rest. If any physical activity is undertaken, discomfort is increased.

Adapted from: The Criteria Committee of the New York Heart Association. Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels. 9th ed. Little Brown & Co; 1994. Pp 253-56.

Table 1: Classification of heart failure symptoms by functional limitation of activities

2) Past medical history

- Previous heart disease? Rheumatic fever?
- Diabetes mellitus, hypertension, hypercholesterolaemia?
- Thyroid disease, haemochromatosis?

3) Family and Social history

- Family history of heart disease?
- Smoking and alcohol history is essential.
- Have his symptoms interfered with his usual daily activities?
- Does he have an occupation likely to be affected by diagnosis of cardiomyopathy (e.g. pilot, HGV driver)?

4) Medication

Which medications can worsen heart failure?

Calcium channel blockers (particularly verapamil), NSAIDs, newly-introduced beta-blockers and some chemotherapy agents (such as doxorubicin).

CARDIOMYOPATHY

A Jordan & F Witherow

Examination

1) Signs of left ventricular failure:

- Tachycardia, hypotension, cool peripheries
- Pulmonary crepitations, rales and/or evidence of pleural effusions
- Third heart sound, displaced apex beat

2) Signs of right ventricular failure

- Raised jugular venous pressure
- Peripheral oedema, ascites and hepatomegaly

3) Signs suggesting a particular aetiology

- Uncontrolled hypertension: an important cause of myocardial dysfunction
- Signs of thyroid disease or haemochromatosis
- Sternotomy and vein/arterial harvest scars for bypass surgery
- Heart murmurs. Remember: valvular pathology may be primary or secondary to ventricular dysfunction.

The patient reveals he has suffered from increasing ankle swelling and then abdominal distension over the past few weeks. During the same time he noticed he was unable to perform his normal daily activities as a builder due to breathlessness. He has needed 4 or 5 pillows at night, which seems to help his breathing.

Initial Investigation and Treatment

Which investigations would you request during your initial assessment?

ECG: this may reveal signs of acute ischaemia or previous myocardial infarction. There may also be features of left ventricular hypertrophy, widened QRS complexes or arrhythmias associated with his cardiomyopathy.

Chest x-ray: pulmonary upper lobe blood diversion, interstitial oedema, cardiomegaly, and/or pleural effusions may be present.

Blood tests: these should include a full blood count, urea and electrolytes, liver function tests and glucose. B-type natriuretic peptide (BNP) can also be measured in some centres. This is a sensitive and specific test for ventricular dysfunction as BNP is released by the ventricles in response to elevated filling pressures and volumes. Though of little clinical value in this case, BNP is predominantly used when the diagnosis of heart failure is uncertain or in long-term follow-up of heart failure patients.

Transthoracic echocardiography: this is a cornerstone in the diagnosis of heart failure and cardiomyopathy, enabling characterisation of chamber dimensions, wall motion, filling pressures and valvular pathology.

The patient's chest x-ray reveals features of pulmonary oedema whilst echocardiography demonstrates a dilated left ventricle in end-diastole with reduced systolic function (ejection fraction <25%) (fig.1). These findings are consistent with a dilated cardiomyopathy resulting in heart failure.

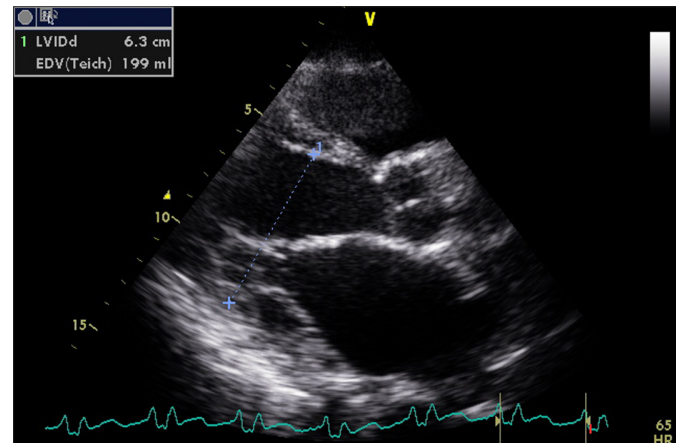


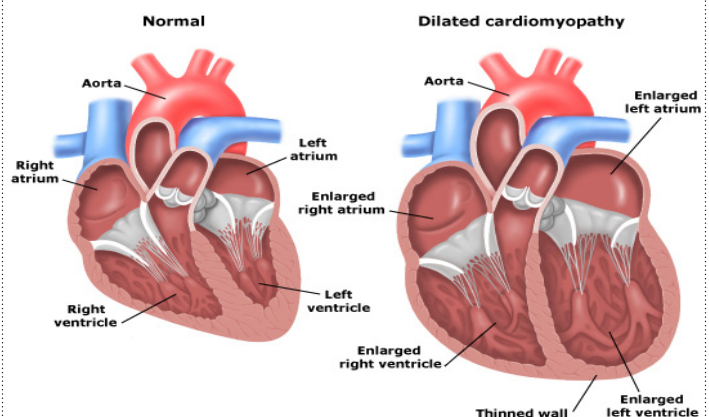
Figure 1: Transthoracic echocardiogram parasternal long axis view showing enlarged left ventricular diameter in end-diastole (>5.9 cm in men), consistent with a dilated cardiomyopathy.

What therapy would you initiate in this patient?

Initial management would include sitting the patient upright and administering oxygen. A loop diuretic and/or nitrate should be given intravenously to reduce preload and promote diuresis. Intravenous opiates can also be used in controlled quantities to promote venodilatation. In selected patients, continuous positive airway pressure (CPAP) ventilation may be required to reduce venous return to the heart and optimise oxygenation.

In the presence of cardiogenic shock, management in a high-dependency setting is appropriate. This may include use of inotropic agents and insertion of an intra-aortic balloon pump. This device is placed in the patient's aorta via the femoral artery. It inflates in diastole and thereby increases coronary perfusion. The balloon then deflates in systole, reducing afterload. In specialist centres, a mechanical pump known as a ventricular assist device (LVAD, RVAD or BiVAD) can be surgically implanted to augment ventricular function, most often as a bridge to cardiac transplantation.

The patient responds to intravenous diuretic and nitrate therapy, as monitored by daily weights and an accurate fluid balance chart. An ACE inhibitor and beta-blocker are also introduced. He is then discharged following demonstration of clinical stability on equivalent oral diuretics.



CARDIOMYOPATHY

A Jordan & F Witherow



Cardiomyopathy. Patient Management.

Further Investigation and treatment

Four weeks later the patient is reviewed in clinic to assess his progress.

He reports still suffering from exertional breathlessness.

Which further treatment options are available for symptomatic and prognostic benefit?

- **Diuretic therapy:** Uptitration of loop diuretic therapy provides symptomatic benefit in patients with signs of fluid overload. Addition of a thiazide diuretic may be considered in resistant cases.

- **ACE inhibitors:** These can be uptitrated, providing both prognostic and symptomatic benefit. In those intolerant of ACE inhibitors, an angiotensin receptor blocker (ARB) should be used.

- **Beta-blockers:** Optimal dosage should be achieved if possible.

- **Aldosterone antagonists:** Provide symptomatic and prognostic benefit in those who do not respond to the above therapy.

- Digoxin or the combination of hydralazine and isosorbide dinitrate can be used in those not responding to standard therapy.

- Implantable cardioverter-defibrillator (ICD) implantation should be considered in patients with left ventricular ejection fraction <35%.

- Cardiac resynchronisation therapy (CRT) is considered in patients with electrical ventricular dyssynchrony (QRS duration >120ms), severe left ventricular dysfunction and ongoing symptoms despite optimal medical management. Cardiac resynchronisation involves implantation of a pacemaker with a left ventricular lead inserted into the coronary sinus. This improves ventricular coordination through timed stimulation with a conventional right ventricular lead. This can be combined with an ICD capability, when it is termed a CRT-D device.

All patients assessed for heart failure should be encouraged to participate in a cardiac rehabilitation programme. These reduce the frequency of hospitalisation and mortality² and improve quality of life³ in such patients.

Further investigation as an outpatient may include:

- Coronary angiography
- Cardiac magnetic resonance (CMR) imaging

CMR not only accurately determines chamber volumes and valvular function but, using late gadolinium as contrast, identifies areas of myocardial scarring, fibrosis or infiltration which can help elucidate the aetiology of ventricular dysfunction.

Patients should receive disease-specific therapy for any underlying cause of ventricular dysfunction, including: ischaemic heart disease, hypertension, valvular heart disease, alcohol excess, haemochromatosis, thyrotoxicosis, pheochromocytoma and Fabry disease. In selected cases, assessment for cardiac transplant may be considered if other treatment options have failed, particularly in younger patients.

Discussion

Cardiomyopathy is defined as a myocardial disorder in which the heart is structurally and functionally abnormal⁴. It may present as the clinical syndrome of heart failure as described above or predominantly with an arrhythmic complaint. The causes of cardiomyopathy have been classified into distinct clinical phenotypes (table 2), the most common of which is dilated cardiomyopathy. Strictly defined, the left ventricular dilatation and dysfunction characteristic of this condition must occur in the absence of causative valvular heart disease, hypertension or coronary artery disease. However, the term “ischaemic cardiomyopathy” is often coined to describe the dilated cardiomyopathy phenotype due to underlying ischaemic heart disease.

Type	Pathological features
Dilated cardiomyopathy	Left (± right) ventricular dilatation and systolic dysfunction
Hypertrophic cardiomyopathy	Myocardial hypertrophy in the absence of haemodynamic stress sufficient to explain the degree of hypertrophy
Restrictive cardiomyopathy	Increased stiffness of the myocardium prevents normal diastolic filling (i.e. diastolic dysfunction), typically described with preserved systolic function
Arrhythmogenic right ventricular cardiomyopathy	Fibrofatty replacement of predominantly right ventricular myocardium (though left-dominant subtypes exist)
Unclassified	Including left ventricular non-compaction and Takotsubo (“stress-induced”) cardiomyopathy

Table 2: Classification of Cardiomyopathies

CARDIOMYOPATHY

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In the case described above, initial management is critical in stabilising and treating an acutely unwell patient promptly and effectively. Determination of the cause of heart failure should begin at initial assessment as an ischaemic, valvular or arrhythmic aetiology may require immediate treatment. A detailed search for a reversible aetiology of dilated cardiomyopathy (table 3) should be included in the evaluation of all patients presenting with heart failure as disease-specific therapy often enables stabilisation and occasionally reversal of the disease process itself.

Underlying Condition	Investigation
Coronary artery disease	Coronary angiogram
Hypertensive heart disease	Blood pressure monitoring
Valvular/congenital heart disease	Echocardiography
Tachyarrhythmias	ECG
Iron overload	Transferrin saturation
Alcohol excess	MCV, liver function tests
Thyrotoxicosis	Thyroid function tests
Acromegaly	Oral glucose tolerance test / IGF-1
Phaeochromocytoma	Urinary catecholamines
Fabry disease	α -galactosidase

Table 3: Investigations to consider for reversible causes of heart failure / dilated cardiomyopathy:

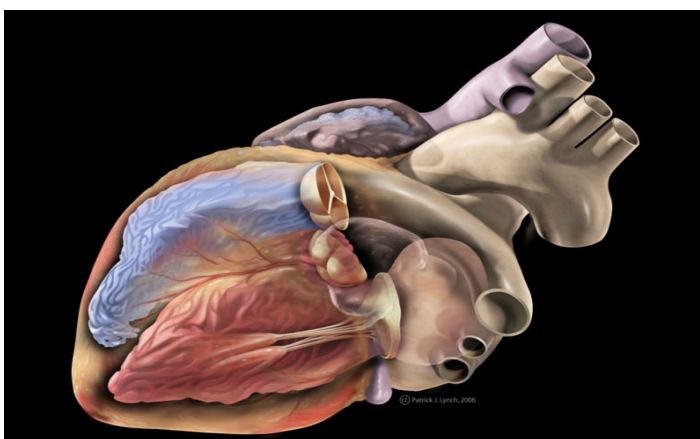
Questions

1) Which of these causes of cardiomyopathy has a genetic aetiology?

- A. Hypertrophic cardiomyopathy
- B. Arrhythmogenic right ventricular cardiomyopathy
- C. Dilated cardiomyopathy
- D. Left ventricular non-compaction
- E. All of the above

2) Of the following treatments for dilated cardiomyopathy, which has been shown to improve prognosis?

- A. Inotropic support
- B. Loop diuretics
- C. Aldosterone antagonists
- D. Home oxygen therapy
- E. Thiazide diuretics



Answers

1. Answer E

All causes of cardiomyopathy have a genetic component, either polygenic or due to single gene mutations. Most patients with hypertrophic cardiomyopathy have demonstrable mutations in the cardiac sarcomere whereas arrhythmogenic right ventricular cardiomyopathy is caused by mutations affecting the cell-to-cell adhesion complexes known as desmosomes. In dilated cardiomyopathy, at least 25% of patients have evidence of familial disease, with mutations encoding various intracellular structural proteins⁵. Although only recently defined, left ventricular non-compaction cardiomyopathy appears to have at least a contributory genetic association, with 25% of affected individuals' relatives having abnormalities on echocardiography.

2. Answer C

Although all of the above treatments can provide symptomatic relief in patients with heart failure, of those listed only aldosterone antagonists (such as spironolactone or eplerenone) confer a prognostic advantage. Current recommendations suggest these should be used as additive therapy to angiotensin converting enzyme inhibitors and beta-blockers in patients with persistent moderate-severe symptoms (ESC 2008).

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References

- 1) Foundation Year Programme Curriculum: core competencies and skills: <http://www.foundationprogramme.nhs.uk/pages/home/keydocuments>
- 2) O'Connor CM, Whellan DJ, Lee KL, et al. Efficacy and safety of exercise training in patients with chronic heart failure: HF-ACTION randomized controlled trial. JAMA 2009; 301(14):1439-50.
- 3) Flynn KE, Pina IL, Whellan DJ, et al. Effects of exercise training on health status in patients with chronic heart failure: HF-ACTION randomized controlled trial. JAMA 2009 ;301(14):1451-9.
- 4) Elliott P, Andersson B, Arbustini E, et al. Classification of the cardiomyopathies: a position statement from the European Society of Cardiology Working Group on Myocardial and Pericardial Disease. Eur Heart J 2008; 29(2):270-6.
- 5) Burkett EL, Hershberger RE. Clinical and genetic issues in familial dilated cardiomyopathy. J Am Coll Cardiol 2005; 45:969-81.

**CASE BASED DISCUSSION –
WOMEN'S HEALTH IN GENERAL PRACTICE**

E King & E Herd

**Case Based Discussion –
Women's Health In General Practice.
Good Clinical Care.****Abstract**

This case based discussion focuses on contraceptive options for an older woman in a primary health care setting. 'Careful assessment and consideration of the wider issues for women's health are required and well provided for in general practice.

Case History

A 46 year old woman presents to her GP for contraceptive advice. She seems embarrassed and her GP is aware that she is recently divorced and has two teenage children. She states that she has been in a new relationship for the past three months and has not used any contraception as her ex-husband had a vasectomy and her new partner is unwilling to use condoms. She does not want to get pregnant at her age and wonders if she may be going through the menopause.

• **What options for contraception would be most appropriate for her?**

• **What do you need to know before starting her on contraception?**

A detailed medical, gynaecological, sexual and family history is needed regarding the possibility of breast or gynaecological cancer, infection and pregnancy.

A thorough history should include the following:

Presenting complaint

1. What methods of contraception has she used in the past?
2. Could she be at risk of pregnancy?
3. Could she be at risk of a sexually transmitted infection?

Past gynaecological history

1. Menstrual history. Last Menstrual Period. Any intermenstrual or post-coital bleeding? This could indicate cervical/vaginal/uterine pathology.
2. Vaginal discharge/dyspareunia? Could indicate infection or pelvic inflammatory disease.
3. Any menopausal symptoms?
4. Are smears up to date and has she ever had an abnormal test?

Past medical history

1. Personal history of breast/gynaecological cancer?
2. Medication.
3. Smoking/other cardiovascular risk factors.

Family history**1. First degree relatives with breast/gynaecological cancer.**

She tells you that she had a 'copper coil' in the past after having her children and has never been on an oral contraceptive. She smokes 5-10 cigarettes daily.

She is still having periods but they have been less frequent for the past year with up to 8 weeks between and heavier than usual with occasional clots and flooding. Her last menstrual loss was 12 days ago but was very light and only lasted 24 hours. Her last episode of unprotected sexual intercourse was prior to this. She thinks she may have started to experience occasional hot flushes. She wonders if she could start on hormone replacement therapy (HRT) as her 80 year old mother has osteoporosis but has recently also been diagnosed with breast cancer.

CASE BASED DISCUSSION – WOMEN'S HEALTH IN GENERAL PRACTICE

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She has not had a smear since her last child was born and has not responded to invitations for repeats.

Her ex-husband and children are also your patients and you have seen all of them at separate times during and since their divorce twelve months ago.

What issues are raised by this consultation?

Pregnancy: Although the history of irregular periods suggests this lady is perimenopausal, it is still possible she could be pregnant and this must be considered.

Gynaecological cancer: For any woman with irregular bleeding it is important to establish a cause to exclude pathology. An interval of more than 12 months between bleeds would constitute post menopausal bleeding (PMB) and warrant further investigation to exclude endometrial pathology. Any woman presenting with an altered menstrual cycle, intermenstrual bleeding, postcoital bleeding, postmenopausal bleeding or vaginal discharge should be offered a pelvic examination with speculum examination of the cervix and cervical smear if indicated. High vaginal and endocervical swabs should be taken if there is suggestive history or findings. This is followed by an urgent referral for colposcopy for women with clinical features of cervical cancer, regardless of whether or not they have had a recent smear test. If a pelvic or abdominal mass is found, (which is not indicative of uterine fibroids or of gastrointestinal or urological origin) an urgent ultrasound should be requested with urgent referral if this is indicative of cancer.¹

Some practices have facilities for a trained GP to carry out pipelle biopsy of the endometrium in the surgery. Together with a normal ultrasound this could exclude malignancy without the need for referral easing pressure on specialist services and avoiding the cost this incurs. The two week rule is employed for any suspected cancer whereby a patient is seen by a specialist within 2 weeks of urgent referral by their GP.

Cervical Smear Screening: The NHS cervical screening programme in England invites women aged 25-49 every 3 years and 50-64 every 5 years to attend their GP practice for a routine smear which is generally carried out by the practice nurse (in Northern Ireland, Scotland and Wales screening starts at 20 and in Scotland finishes at 60). It is not uncommon for women to disregard cervical smear invitations, especially in the older age group, and the opportunity should be taken to do one for this lady at this consultation.



HRT: Hormone replacement therapy provides effective relief of menopausal symptoms of hot flushes, night sweats, vaginal dryness and mood changes, and also delays post-menopausal loss of bone density. For most symptomatic women the benefits of HRT outweigh the risks but as with any new treatment, the potential risks should be explained to the patient. Her mother's diagnosis of breast cancer at age 80 is not significant but present evidence suggests there is a small increase in breast cancer in patients on combined HRT in the order of 3 extra cases per 1000 women using it for 5 years between 50-59 years.

Breast cancer: GP practices have a role in encouraging all women to be breast aware; the majority of breast cancers are found by women themselves. NICE have published urgent referral criteria for breast lumps.¹ Routine screening with mammography starts at 50 and invites women for testing every three years up to the age of 70. Those over 70 are encouraged to make their own appointments.

Contraception: Although the risk of pregnancy is low, due to unpredictable ovulation there is still a need for contraception in perimenopausal woman up to 2 years after the last period under age 50 and for 1 year for women over 50. FSH levels can give an indication of ovarian function.

Barrier methods with or without spermicide are effective and also reduce sexually transmitted infection (STI) risk, but compliance may be an issue with this lady's new partner. The medical history, in particular hypertension, venous thromboembolism (VTE) risk, smoking and obesity, makes the combined oral contraceptive pill less suitable. The progesterone only pill is suitable for older smokers but irregular periods are more likely.

NICE (National Institute for Clinical Excellence) recommends the Intrauterine System (IUS)/Intrauterine Contraceptive device (IUD) be offered to all women seeking a long term contraceptive.

This lady does not wish to use barrier contraception or the pill so the IUD would be a good option for her once pregnancy has been excluded. She should be counselled about the small risks of uterine perforation (less than 1 in 1000), expulsion (1 in 20 generally in the first year) and a failure rate of less than 1 per 100 woman years.

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A copper IUD is effective for 5 to 10 years, depending on the device, but she should be counselled that her periods may be longer or heavier particularly in the first 3-6 months. A progesterone-releasing IUS (Mirena) would both provide long-term contraception for 5 years and control her heavy periods, most users becoming amenorrhoeic (65% at 1 year post insertion).⁸ The IUS releases levonorgestrel and, as well as very effective contraception, is the first line pharmacological treatment for menorrhagia reducing menstrual losses by up to 90%. An added benefit, should she elect to start HRT, the IUS is licensed for use with oestrogen-only-HRT for control of menopausal symptoms, offering protection from endometrial hyperplasia (licensed for 4 years only if used for this purpose). The IUS is not licensed for use as emergency contraception. There is no evidence that levonorgestrel has a detrimental effect on bone density.

Confidentiality: The patient is embarrassed to be seeking contraception as she does not as yet want her family or ex-husband to know about her new relationship. You have known both of them for many years and it is important to maintain her trust and reassure her about confidentiality.

Priorities

- Do a pregnancy test. Most surgeries have sensitive pregnancy tests available. This only becomes positive around 10 days after ovulation so may need repeating if dates are uncertain.
- Swabs to exclude STI particularly if considering IUS/IUD insertion.
- Pelvic and speculum examination to assess need for further investigation. If her presenting complaint was heavy periods alone, as per NICE guidelines, treatment can be started without examination if there were no other concerning factors such as intermenstrual or post-coital bleeding.
- Cervical smear
- Effective safe contraception is necessary after counselling to discuss the related issues.
- Blood FSH levels to establish perimenopausal status – FSH is helpful only if the diagnosis of climacteric symptoms is in doubt and the levels are >30iu/l. In the perimenopause FSH has daily variation which gives it a limited value. This lady is at the right age for “the change” and has the symptoms we expect. She should have TSH levels taken to exclude hypothyroidism as cause for her symptoms.



Women's health covers many issues and is particularly involved with the preservation of wellness, prevention of illness in women including screening and ensuring health information is available. General practice and the extended primary care team are ideally suited to accommodate this holistic approach.

Many GP practices will have a trained GP who can fit IUDs, including copper IUDs for emergency contraception, and insert long-acting reversible contraceptive implants. This is funded as a Local Enhanced Service following NICE guidance as are sexual health services which is a resource which can be shared between several practices.

Update

Gynaecological examination was entirely normal and results of the pregnancy test and swabs were negative, cervical smear normal, with serum FSH levels in the perimenopausal range. The patient was greatly reassured and after discussion with the practice nurse, decided she would like to take greater responsibility for her health in future by attending invitations for screening and seeking help for giving up smoking. She decided that she wanted to have an IUS fitted but as her flushes were not troublesome and she had no other symptoms she did not want to start HRT yet.

Self-assessment best of five questions**1. Concerning the levonorgestrel-releasing IUS (Mirena)**

- a. The primary mode of action is inhibition of ovulation.
- b. The IUS can be used as a first line option to treat menorrhagia.
- c. IUS contraceptive efficacy is similar to copper IUCDs.
- d. IUS delays return to fertility for several months.
- e. IUS is contraindicated if fibroids are the cause of menorrhagia.

CASE BASED DISCUSSION – WOMEN'S HEALTH IN GENERAL PRACTICE

E King & E Herd

2. Which of the following statements are correct about services for Women's Health available in General Practice?

- Women-specific health matters account for over 25% of a general practitioner's time.
- Contraceptive services including emergency IUD insertion should be made available.
- Cervical smear screening should be offered to all young women from first sexual contact.
- Human papilloma virus vaccination is available in general practice.
- Well women clinics should provide information on mental health problems, eating disorders, domestic violence as well as monitoring HRT and pre-pregnancy counselling.

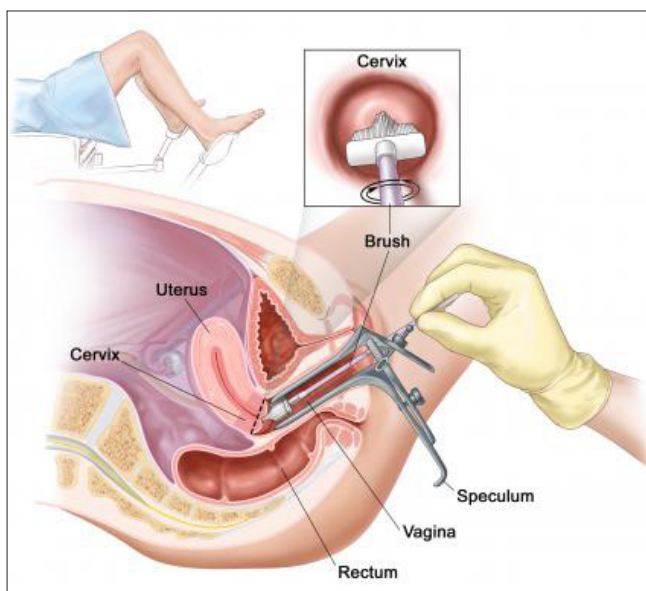
Answers

1. b and c. are correct.

The primary mode of contraception is its action on the endometrium preventing implantation with inhibition of sperm penetration in addition. There is rapid return of fertility after removal. Unless fibroids distort the uterine cavity significantly they are not a contraindication for IUS insertion, although effectiveness in controlling menorrhagia may be reduced. Nulliparity and a past history of STI are not contraindications to IUS or IUD insertion.

2. a. b. and e. are correct.

Cervical screening in England and Northern Ireland starts at age 25 and age 20 in Scotland. An HPV vaccination programme has been rolled out for 12-17 year old girls since September 2008 but is primarily carried out at secondary schools.



References

- NICE guideline. Referral for suspected cancer. <http://www.nice.org.uk/nicemedia/live/10968/29814/29814.pdf>
- Government White Paper. The new NHS; modern, dependable. 1997.
- NHS cervical screening programme. <http://www.cancerscreening.nhs.uk/cervical/index.html>
- CSM Drug Safety Update Vol 1, Issue 2, Sept 2007
- Beral V. Breast cancer and hormone-replacement therapy in the Million Women Study. *Lancet*. 2003; 9;362(9382):419-27.
- Department of Health. Breast awareness. London: Department of Health, 1991 (Professional Letter: PL/CMO(91) 15, PL/CNO(91)12) available online: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4065322.pdf
- NHS breast screening programme. <http://www.screening.nhs.uk/breastcancer-england>
- WHO. Department of Reproductive Health and Research. Medical Eligibility Criteria for Contraceptive Use, 4th edition, 2008.
- NICE clinical guideline. Long acting reversible contraception: the effective and appropriate use of long-acting reversible contraception; 2005.
- Faculty of sexual and reproductive healthcare clinical guidance: Intrauterine contraception 2007. <http://www.ffprhc.org.uk/admin/uploads/CEUGuidanceIntrauterineContraceptionNov07.pdf>
- NICE clinical guideline. Heavy Menstrual Bleeding. January 2007
- Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit. FFPRHC Guidance (April 2006). Emergency contraception. *J Fam Plann Reprod Health Care* 2006; 32: 121-128.
- Mazza D. Women's health in general practice. Butterworth-Heinemann 2004 BMA location: WA 309
- Royal College of General Practitioners curriculum statement 10.1: Women's health. 2007 http://www.gmc-uk.org/10_1_Womens_Health_01.pdf_30449528.pdf

DIAGNOSING DEMENTIA IN PRIMARY CARE

C Howes & O Corrado



Diagnosing dementia in primary care. Patient Management.

Background

Dementia represents a big diagnostic challenge for primary care health professionals as it is often insidious in onset and can present with varied symptoms and signs. The cost of care for people with dementia in the UK is greater than the combined annual expenditure on heart disease, stroke and cancer, combined. An early diagnosis of dementia is crucial as this enables patients and their families to seek early and appropriate support from medical and psycho-social services, significantly improving morale and delaying the need for 24 hour care¹.

It has been estimated that in the United Kingdom a General Practitioner (GP) with an average list size will have a caseload of ten and an incidence of 1.6 new patients with dementia per GP year². The same study² highlighted that despite significant levels of disability the majority of sufferers with dementia live in their own home. The primary care team therefore has a vital role as the first point of contact for people with dementia and their families and are central in both establishing a diagnosis of dementia and in its future management and support.

Some studies suggest that up to 75% of patients with moderate to severe dementia are under-recognised as having significant cognitive impairment by GPs³.

Recognition and assessment of patients with symptoms of cognitive impairment may not highlight a treatable or reversible cause but a definitive diagnosis enables patients and families to engage early with services; reducing emotional distress, and carer burden.

This article focuses on the assessment, diagnosis and initial management of dementia presenting in a primary care setting, as well as a brief outline of secondary care assessment and management.

Scenario

Mrs Edith Smith is an 81 year old lady who has been attending the surgery for over fifty years. She lives with her 85 year old husband Mr Derek Smith in a two bedroom terrace house. They have no help from social services or any other agency. Mrs Smith's daughter and husband have attended the surgery because they are concerned Mrs Smith has recently been exhibiting odd and worrying behaviour. As the Foundation Year 2 doctor in the practice you are asked to see her, how would you approach the situation?

Initial assessment: History taking

It is important to obtain a thorough history. It is useful to interview the patient and their accompanying relatives both together and separately. Interviewing Mrs Smith alone enables a simple assessment of her memory, language and orientation without their being masked by interruptions or assistance from a third party. However it is important to obtain a collateral history from her family.

Important aspects of history taking are outlined in the Table below:

Key points	
Symptoms at onset	agitation, aggression, apathy, depression, disinhibition, hallucinations, sleep disturbance.
Time/speed of evolution of symptoms	Stepwise, fluctuating, rapidly progressive.
Aspects of memory	<ol style="list-style-type: none"> 1. Anterograde: losing objects, repetitive questioning, getting lost, reliance on lists, failure to follow plots of films 2. Semantic: reduction of vocabulary-words substituted by "thing" 3. Working: retention of new information 4. Retrograde: recall of past events 5. Implicit: learned responses not available for recall eg. Playing music, driving.
Review of comorbid health	Vascular risk factors, anxiety, depression, previous delirium, malignancy, stroke, metabolic endocrinopathies.
Medication review: inciting agents	Narcotics, sedatives, anxiolytics, anticholinergics.
Social Review	<ol style="list-style-type: none"> 1. Safety concerns eg. driving, gas fires, cooking, wandering 2. Level of independence and continence 3. Impact on work and family life 4. Finances and benefits.
Family history of dementia	Age at onset and course.

Table 1: Key points in dementia history

DIAGNOSING DEMENTIA IN PRIMARY CARE

C Howes & O Corrado

Initial assessment: Physical examination

Neurological system

It is important to examine Mrs Smith at rest to look for resting tremor, dystonia, myoclonus, chorea or any other involuntary movements. Look closely at all muscle groups for the presence of fasciculation. Check tone and power especially in the presence of any localising signs. Extrapyramidal and pyramidal signs should be specifically sought and gait assessed whenever possible. Peripheral neuropathies are common in the elderly often as a result of metabolic endocrinopathies and can impair gait. Ocular examination should include visual acuity, eye movements, visual fields and fundoscopy. A brief assessment of speech and swallowing may uncover bulbar/pseudobulbar features. Apraxia can be assessed by asking Mrs Smith to copy gestures or perform alternating hand movements. Check for dysphasia

It is vital to assess cognition, one of the best tests to do this for dementia in the primary care setting is the mini mental state examination. A score of between 25-30 is considered normal, 21-24 as mild, 10-20 as moderate and <10 as severe cognitive impairment⁴.

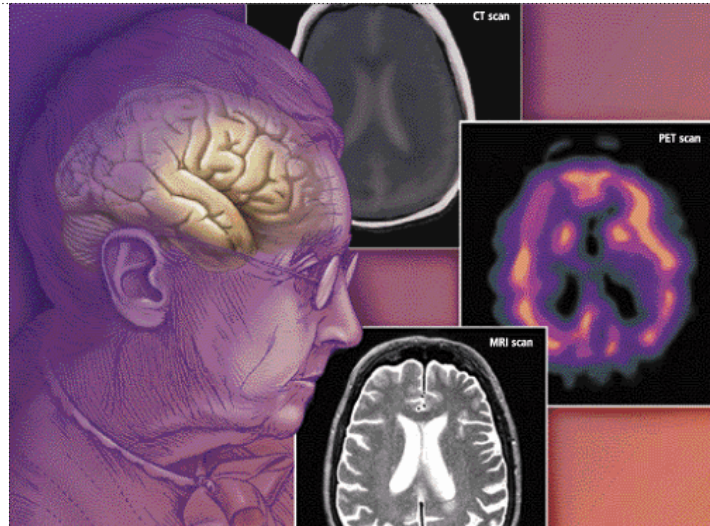
Other systems

Examination of other systems should include looking for systemic disease that may cause or mimic a dementia syndrome eg. infection, vasculitis, metabolic endocrinopathies or malignancy. Close attention should be paid for evidence of chronic alcohol abuse and end organ damage from cardiovascular or cerebrovascular disease.

Initial assessment: Investigations

According to NICE⁵ a basic dementia screen should be performed at the time of presentation, usually within primary care and should include:

- **Routine haematology eg. blood count and blood film if clinical suspicion of haematological malignancy**
- **biochemistry including electrolytes, calcium, glucose +/- Hba1c and renal and liver function**
- **thyroid function tests**
- **CRP if infection or delirium is a possibility**
- **serum vitamin B12 and folate levels**
- **a midstream urine test should be carried out if delirium is a possibility**



The clinical presentation should determine whether investigations such as chest x-ray or electrocardiogram are needed.

According to NICE⁵ syphilis and HIV serology should not routinely be requested in the investigation of dementia unless the clinical picture dictates.

Mrs Smith's family describe her memory starting to deteriorate about 5 years ago, but this has become much more pronounced over the past year. Her husband says that she has started to neglect her personal hygiene which is very uncharacteristic for her, and has become aggressive with him and started to swear. She has deteriorated to such an extent that he doesn't leave her alone at home in case 'she does something daft'. Their daughter has become increasingly involved in providing her support and this has started to put a strain on her job and marriage.

As the FY2 what would you do next?

Secondary Care assessment and management

Health professionals in primary care should consider referring any person with signs of mild cognitive impairment for an assessment by memory assessment services, in order to aid early identification of dementia⁵. Memory assessment services should be the single point of referral for all people with a possible diagnosis of dementia.

Secondary care clinical assessment of Mrs Smith would include structural imaging using CT scanning to exclude other cerebral pathologies and help diagnose dementia subtype, as well as cognitive, functional and carer assessments.

DIAGNOSING DEMENTIA IN PRIMARY CARE

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Factors considered in dementia assessment and management within secondary care are outlined below:

Drug therapy

Three acetylcholinesterase inhibitors (donepezil, galantamine and rivastigmine) are licensed for use in the management of patients with moderate Alzheimer’s disease severity (MMSE 10-20)⁵. Patients are reviewed every six months for cognitive, functional and behavioural assessment and medication only continued if the MMSE score remains above ten. Memantine which works on the glutamate pathway may be licensed for the treatment of dementia in the near future.

Antipsychotic medication may be introduced in patients with challenging behaviour eg. agitation, wandering, sexual disinhibition and aggression. The use of antipsychotics in patients with dementia has been associated with an increased risk of stroke and cognitive decline⁶ and therefore initiation of such therapies requires specialist assessment and counselling of patients and their carers. Anti-cholinesterases and memantine also have a significant affect on behavioural aspects of dementia.

Driving

Patients with a diagnosis of dementia must inform the DVLA if they wish to continue driving. The DVLA will, with the patients’ permission, request a medical summary from the consultant or GP and upon receipt of this will make a decision as to whether the person can continue to drive. Sometimes the DVLA may request a person undergoes a driving assessment.

Patient support and education

Patients receive ongoing assessment by the multi-disciplinary team (MDT), and care plans are made where needed. Care plans aim to maximise social independence, enhance function and minimise the need for support.

The memory assessment services will provide information regarding local and national support groups. The Alzheimer’s society runs social and ‘befriending’ events in most local areas, as well as a monthly magazine free to all members.

Carer support and education

A Comprehensive assessment of the needs of people with dementia includes assessment of the needs of their carers. Carers often experience high levels of psychological distress and respite/day care services are an invaluable resource. The Alzheimer’s Society provides online, telephone and local group support services and can provide assistance in organising respite care. Patients who need help with activities of daily living (washing, dressing, grooming and toileting) should apply for the Attendance Allowance (or the appropriate benefit according to their age).

Medico-legal issues

Lasting power of attorney (LPA), introduced in October 2007, allows a patient with dementia to appoint an attorney to make decisions on their behalf when they no longer have the mental capacity to do so. This process is encouraged as soon after diagnosis as possible when the patient has the capacity to make such decisions. There are two types of LPA; health and welfare LPA and property and financial affairs LPA. They must be registered with the office of public guardian before they come into force.

Subtypes of dementia

There are many different types of dementia and it is possible for a person to have more than one type. Where possible, dementia subtype identification can allow initiation of specific management. The four most common subtypes are briefly summarised below:

	Alzheimer’s dementia	Vascular dementia	Lewy body dementia	Fronto-temporal dementia
Frequency (% of all dementia cases)	50-60%	30-40%	15%	5%
History	Gradual onset and progression	Abrupt or gradual onset Stepwise or gradual progression	Insidious onset Progression with fluctuations	Younger age at onset and often insidious Rapid progression
Clinical diagnostic features	Aphasia, apraxia, agnosia, alexia, agraphia	Vascular risk factors especially established stroke disease. Relative preservation of personality. Focal neurological signs more common.	Fluctuations in cognition, visual hallucinations, bradykinesia. Increased sensitivity to neuroleptics.	Poor judgement, social withdrawal, impulsivity and socially inappropriate behaviour.
CT findings	Generalized atrophy with noted medial temporal lobe atrophy	Strokes, lacunar infarcts, white matter lesions are noted	Generalized atrophy throughout	Atrophy of frontal and temporal lobes
Pathology	Beta amyloid plaques and neurofibrillary tangles.	Cerebrovascular disease due to high prevalence of vascular disease.	Lewy Bodies in both the cortex and the midbrain areas	Pick cells and bodies in the cortex

Table 2: Subtypes of dementia

DIAGNOSING DEMENTIA IN PRIMARY CARE

C Howes & O Corrado

Mrs Smith's history is highly suggestive of Alzheimer's Disease, she was found to have a Mini Mental State Examination of 19/30 but no other abnormal physical signs. She was referred to social services who organised day care and respite care for her. The Alzheimers Society was a great source of support and advice for the patient's daughter. She was referred to the local memory clinic who arranged a CT Head Scan this showed excessive global atrophic change, more marked in the medial temporal areas in keeping with Alzheimer's disease and she was established on an anti-cholinesterase.

References

1. Mittelman MS, Ferris SH, Shulman E, Steinberg G, Levin B. A family intervention to delay nursing home placement of patients with Alzheimer's disease. *JAMA* 1996; 276: 1725-31.
2. Eccles M, Clarke J, Livingstone M, Freemantle N, Mason J. North of England evidence based guidelines development project: guideline for the primary care management of dementia. *British Medical Journal* 1998; 317:802-808.
3. Gifford DR, Cummings JL. Evaluating dementia screening test. Methodologic standards to rate their performance. *Neurology* 1999; 52:224-7.
4. McDowell I, Kristjansson B, Hill GB, Hebert R. Community screening for dementia: the Mini Mental State Exam (MMSE) and Modified Mini-Mental State Exam (3MS) compared. *Journal of Clinical Epidemiology* 1997;50:377e83.
5. NICE guideline 42. Dementia: supporting people with dementia and their carers in health and social care. November 2006.
6. Schneider LS, Dagerman KS, Insel P. Risk of death with atypical antipsychotic drug treatment for dementia. *The Journal of the American Medical Association* 2005; 15:1934-43.

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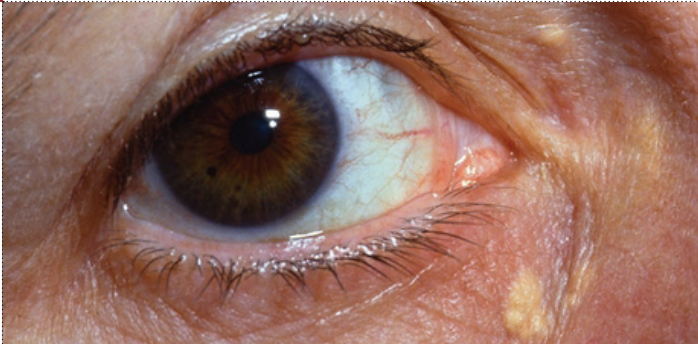
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**Diagnosing dementia in primary care.
Patient Management.**

CASE BASED DISCUSSION – HYPERLIPIDAEMIA

A Luvai¹ & W Mbagaya¹



Case Based Discussion – Hyperlipidaemia. Patient Management.

Abstract

This case based discussion focuses on a lady with hypercholesterolaemia following an acute admission for severe sepsis. We will discuss the assessment, differential diagnosis and management of secondary hyperlipidaemia.

Case History

A 52 year old lady with unusually elevated cholesterol is referred to the lipid clinic a few weeks after an acute admission for sepsis. During the admission, she required intravenous antibiotics and subsequently developed cholestasis as a side effect.

What is the likely cause for her raised cholesterol?

How would you proceed?

Multiple mechanisms can lead to hyperlipidaemia.¹ It is therefore essential to undertake a thorough history and physical examination to elucidate the underlying contributory factors.

History

- **When did she first have elevated cholesterol? What were the previous values?**
- **Has she had angina, stroke, pancreatitis or claudication in the past?**
- **Does she have hypertension, diabetes, thyroid or renal disease?**
- **What medications does she take? For how long has she used them?**
- **Does she drink alcohol or smoke? If so, how much?**
- **Is there a family history of cardiovascular disease, sudden death or elevated cholesterol?**
- **What are her dietary habits?**

It transpires that the patient had normal cholesterol prior to her admission to hospital. She had no history of cardiovascular disease, diabetes, thyroid or renal problems. She was a non-smoker who rarely drank alcohol and had a healthy diet. There was no family history of hyperlipidaemia or cardiovascular disease. She had received co-amoxiclav and piperacillin/tazobactam during her hospitalisation. She was recovering from hepatic cholestasis.

Physical examination

- Weight, height and BMI
- Blood pressure
- Stigmata of hyperlipidaemia – corneal arcus, xanthelasma or xanthomata
- Cardiovascular examination – peripheral pulses, carotid bruit, cardiac sounds
- Endocrine – goitre, features of hypothyroidism
- Abdominal – hepatosplenomegaly

On examination she had a BMI of 27 with an elevated blood pressure of 156/92mmHg. There were no stigmata of hyperlipidaemia. Cardiovascular and endocrine evaluations were satisfactory.

However, her liver was palpable 5 cm below the right costal margin. No other abdominal findings were elicited.

What investigations would you request?

- Urea and electrolytes – to assess renal function
- Urinalysis – to identify proteinuria
- Fasting glucose – to diagnose diabetes
- Liver function tests – to assess the severity of hepatic cholestasis
- Fasting lipid profile – to establish the pattern and severity of hyperlipidaemia
- Thyroid function tests – to diagnose hypothyroidism
- Consider whether to commission additional investigations if they are not available from the recent hospitalisation – ECG, liver ultrasound

She was found to have normal renal function with no proteinuria. She was not diabetic or hypothyroid. She had elevated cholesterol of 12.9 mmol/L with triglycerides of 1.3 mmol/L. Her alkaline phosphatase was >2000 iu/L with a modest increase in bilirubin and gamma-glutamyl transferase observed, though her alanine amino-transferase was normal. Liver ultrasound did not identify any gallstones or obstruction within the common bile duct.

CASE BASED DISCUSSION – HYPERLIPIDAEMIA

A Luvai¹ & W Mbagaya¹

Diagnosis

This patient has a secondary hyperlipidaemia due to hepatic cholestasis which occurred following antibiotic use.

Management

The management of this patient will be conservative. Antibiotic associated hepatic cholestasis can linger for several months before complete resolution. During this time, enterohepatic circulation of cholesterol is impaired and hence the lipid abnormality observed. The hypercholesterolaemia would resolve with hepatic recovery.

Treatment with lipid adjusting therapy such as statins is therefore not indicated. The patient should be monitored at 8 weekly intervals with serial liver function tests and lipid profiles until recovery is complete. It must be noted that statins have been shown to improve dyslipidaemia and vascular function in patients with chronic cholestasis from primary biliary cirrhosis.²

Discussion

Secondary hyperlipidaemias are common and are reported to account for up to 40% of all hyperlipidaemias.³ The important underlying factors are metabolic, dietary and drugs. A key distinguishing feature of secondary hyperlipidaemias, is their reversibility upon treatment of the underlying condition. In most instances, lipid lowering therapy is not required.

Hypercholesterolaemia	Mixed hyperlipidaemia	Hypertriglyceridaemia
Drugs		
Progestogens Thiazides	Corticosteroids Progestogens Retinoids Thiazides	Protease Inhibitors Beta blockers Corticosteroids Cyclosporin Oestrogens Progestogens Retinoids Thiazides
Metabolic		
Hypothyroidism Cholestasis Nephrotic syndrome Porphyria Pregnancy	DM Nephrotic syndrome CKD	Obesity Type 2 DM Nephrotic syndrome CKD Paraproteinaemia
Dietary		
Saturated fat Cholesterol	Excess calories Saturated fat	High carb diet (>60% energy) ETOH

Table 1: Causes of Secondary Hyperlipidaemia

In the case of the patient discussed, the key aspect of her management was a detailed history to identify the possible underlying mechanism, which allowed appropriate examination and investigations to identify her secondary hyperlipidaemia. Appropriate management spared the patient use of unnecessary lipid lowering therapy and potential side effects.

Where a secondary cause of hyperlipidaemia is not identified the assessment should focus on diagnosing a primary hyperlipidaemia. Primary hyperlipidaemias are the most common form of hyperlipidaemia and arise from an interaction between genetic predisposition and environmental influences. They can be classified according to the underlying metabolic defect in lipid handling.³



a) Polygenic hypercholesterolaemia

This defines a heterogeneous group of patients who have elevated cholesterol, but none of the recognised monogenic disorders of lipid metabolism. The majority of patients presenting with primary hyperlipidaemia will have polygenic hypercholesterolaemia.

b) Familial hypercholesterolaemia (FH)

FH is an autosomal dominant disorder arising from a mutation in the LDL receptor or other proteins required for its function such as apoprotein B-100. Over 150 mutations have been described. Heterozygous FH patients will have elevated cholesterol, a family history of ischaemic heart disease and typical clinical features. Tendon xanthomas are a pathognomonic sign. Homozygous FH is very rare but leads to ischaemic heart disease and death in late childhood or adolescence if untreated.

c) Familial combined hyperlipidaemia (FCH)

This is a common condition characterised by an elevation of both cholesterol and triglycerides as well as a family history of ischaemic heart disease. Unlike FH patients, they do not have typical physical signs.

d) Remnant hyperlipidaemia

This rare cause of elevated cholesterol and triglycerides is due to a variant in apoprotein E2 which results in impaired handling of triglycerides. It carries a high risk of cardiovascular disease. Typical clinical signs include palmar crease xanthomas and tubero-eruptive xanthomas.

e) Rarer disorders

These include Tangier disease and lipoprotein lipase deficiency.

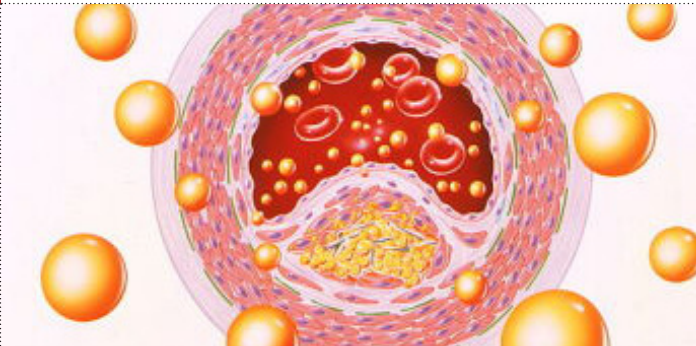
Management of Primary hyperlipidaemia

The aim of treatment is to reduce cardiovascular risk and normalise the deranged lipid profile. A multi-modal approach is required to achieve this.⁴

- **Smoking cessation**
- **Reduction in total fat and cholesterol intake**
- **Reduction in alcohol to the recommended weekly intake**
- **Weight reduction and exercise**

CASE BASED DISCUSSION – HYPERLIPIDAEMIA

A Luvai¹ & W Mbagaya¹



Case Based Discussion – Hyperlipidaemia. Patient Management.

• Drugs

- Statins
- Fibrates
- Ezetimibe
- Bile acid sequestrants
- Niacin

Lipid lowering therapy should be offered to patients at high cardiovascular risk and those who have already had a cardiovascular event.

Self assessment best of five questions

1. A 60 year old lady on thyroxine for hypothyroidism is referred because of persistently high cholesterol of 8mmol/L for the last year. She has no family history of cardiovascular disease. At examination she has a BMI of 31, coarse skin and hair and appears forgetful. Which of the following would be part of your initial management?

- a) Give her a statin
- b) Give her a fibrate
- c) Observe for another year
- d) Refer to a memory clinic
- e) Check thyroid function and adjust her thyroxine

2. Which of the following drugs is likely to cause hypertriglyceridaemia?

- a) Propranolol
- b) Dexamethasone
- c) Indapamide
- d) Ritonavir
- e) All the above

Answers

1. Answer: e.

This patient has typical symptoms of hypothyroidism. She further has hypercholesterolaemia because of this. The correct management would be to check her thyroid status and increase her thyroxine appropriately. Adequate thyroid hormone replacement would result in improvement of her cholesterol. If the cholesterol remains unacceptably high at this point, lipid lowering therapy may be considered to reduce this further.

2. Answer: e.

Betablockers, corticosteroids, thiazides and protease inhibitors all cause elevated triglycerides largely through their effect on insulin resistance.

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References

1. Durrington PN. Hyperlipidaemia Diagnosis & Management. 3rd Edition 2007 Hodder Arnold Ltd.
2. Stojavic T, et al. Low-dose atorvastatin improves dyslipidaemia and vascular function in patients with primary biliary cirrhosis after one year of treatment. *Atherosclerosis*. 2010 Mar; 209(1):178-83.
3. Feher MD, Richmond W. Lipids and lipid disorders. 3rd Edition 2003 Elsevier Science Ltd.
4. NICE clinical guideline 71. Familial hypercholesterolaemia. Aug 2008.
5. Foundation Year Programme Curriculum: core competencies and skills <http://www.foundationprogramme.nhs.uk/pages/home/key-documents#foundation-programme-curriculum>

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