

C CASE STUDY
FEEDBACK



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Notes

Guest Cardiologist
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Panel comments summarised and edited by
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Feedback
bpac^{nz} welcomes comments on this case study.

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Case Study: Cardiovascular Disease

Case

Ian is a 60 year old man who has recently transferred to your practice from another town. He has come at the urging of his wife for a "heart check up", as his 63 year old brother has recently had an MI.

You ascertain the following from Ian:

He has no symptoms of angina, dyspnoea, palpitations or claudication

He has a history of osteoarthritis but no other chronic medical problems

He does little exercise, partly due to his osteoarthritis

He gave up smoking 6 years ago, he drinks approx. two glasses of alcohol at night

He has no history or family history of diabetes

Medications: Paracetamol or diclofenac prn for knee

Relevant examination findings are:

Pulse 80 reg

BP 160/95

Chest clear, normal heart sounds

Good peripheral pulses

BMI 28 Waist Circumference 103cm

You arrange blood tests including fasting lipids and glucose, and will review Ian with these next week.

Notes

This case study has now closed. CME points have been entered online for those who responded by 30/Aug.

Winners of copies of the BNF will be notified individually.

Ian returns as arranged

Repeat BP's: 160/95 165/100 mmHg

Blood results: glucose 5.5 mmol/L

Lipids: total cholesterol 6.6mmol/l, HDL 1.1mmol/l, LDL 3.7 mmol/l, ratio 6.0

1. According to the NZ cardiovascular risk assessment tables what is his 5 year CVD risk?
 mild (<10%) moderate (10-15%) high (15-20%) very high (>20%)

2. If you were to treat his hypertension, what drug(s) would you chose?

ACE inhibitor beta blocker thiazide diuretic calcium channel blocker

Drug 1: _____ dose: _____

Drug 2: _____ dose: _____

3. Would you prescribe any other drugs?

No Yes Specify:

At the age of 67 Ian suffers an MI. He makes a good recovery from this. He does not report any angina symptoms following his MI.

4. Assuming there are no contraindications, which medications should Ian ideally be on for CVD secondary prevention? (List class or drug names)

Ian has stable health for the next 2 years.

At age 69 he comes to see you complaining of breathlessness on exertion, which has become gradually more noticeable over the last few weeks. On examination you find signs consistent with mild heart failure.

5. What investigations would you order to aid your diagnosis and management?

At age 70 Ian develops persistent AF. Along with rate control medication anti-coagulation is advised.

6. What INR range would you aim for?

1.5- 2 2-3 >3

7. When his INR is stable, how often will you check it?

2 weekly 4 weekly 6 weekly Other, specify:

Case results with GP panel comments

Q1. Cardiovascular risk:

Very High:	5.5%
High:	84.5%
Moderate:	9%

Panel comments

Using the New Zealand risk calculation tables at face value Ian is in the "high risk" category for CVD. However he would meet the criteria for having the metabolic syndrome, in which case 5% should be added to the calculated risk, putting him in the "very high risk" category. Criteria for diagnosis of the metabolic syndrome are three of the following:

Risk factor	Defining level
Abdominal obesity	waist circumference >102cm*
Triglycerides	1.7 mmol/L*
HDL cholesterol	1.0 mmol/L
Blood pressure	130/85*
Fasting glucose	6.1 mmol/L

Ian meets the three-asterixed criteria. Triglyceride levels were not given in this case, but can be worked out to be high at 3.9mmol/L from the formula:

Total chol. = LDL + HDL + triglyceride/2.2
(The Interpretation of Laboratory Tests, 2001)

Ian's ethnicity was not specified: if of Maori, Pacific Island or Indian sub-continent ethnicity 5% should be added to the initial calculation. As pointed out by some respondents a fasting glucose of 5.5mmol/L does not necessarily rule out diabetes; the New Zealand guidelines on type II diabetes management recommend an OGTT for people with a fasting glucose of 5.5-6.0 and who are of non-European ethnicity or have features of the metabolic syndrome. (NZGG 2003) For the remainder of the case however the assumption is made Ian does not have diabetes.

Q2 Class of drug preferred for Ian's hypertension treatment:

From the check boxes

Where 1 class was specified :

Thiazide diuretic:	81%
Beta blocker:	12%
ACE inhibitor:	6.5%
Calcium channel blocker:	0.5%

Where 2 classes were specified

Thiazide-Beta blocker:	67%
Thiazide-ACE inhibitor:	22%

Specific drugs and doses:

The most common first-line drugs specified were:

Bendrofluazide:	76%
Metoprolol:	9.5%
ACE inhibitor (various):	7%
Atenalol:	4.5%

90% of bendrofluazide prescribers chose a 2.5mg dose.

Of those who specified 2 drugs, the most common combinations were:

1.Bendrofluazide-2. metoprolol:	31.5%
1.Bendrofluazide-2.atenalol:	20.5%
1.Bendrofluazide-2.ACE inhibitor (various):	28%

The assumption has been made that where two drugs were listed "drug 1" is the first-line choice.

Overall bendrofluazide was by far the preferred first drug, with beta blockers (mainly metoprolol) most commonly listed second.

Panel comments

The favoured use of low-dose thiazide diuretics seems appropriate. These are the most cost-effective antihypertensives, and are worth considering as first-line treatment for most people. Recently issued guidance from NICE (Aug 2004) recommends thiazide diuretics first line, and adding either a beta-blocker or ACE inhibitor if target blood pressure is not reached. (ACE inhibitors preferred over beta-blockers if there is a high risk of new-onset diabetes). According to NICE calcium channel blockers should be a third-line choice for most people, although the European Society of Hypertension recommend calcium channel blockers may be an appropriate first-line choice in elderly patients with isolated systolic hypertension. However all the classes listed are effective antihypertensive agents, patient preference re dosing regimens and side effect profiles should also be considered when choosing a first-line antihypertensive.

Many patients will require more than 1 drug for hypertension control.

A side effect of beta-blockers, particularly metoprolol, sometimes overlooked is vivid dreams/nightmares. Atenolol is less likely to do this. Some panel members favour atenolol over metoprolol if using beta-blockers as atenolol is significantly cheaper. NSAIDs should be stopped if possible; paracetamol would be preferable for Ian's osteoarthritis.

Q3. Would you prescribe any other drugs?

Yes:	71%
No:	29%

Of those who said yes:

22% would prescribe aspirin
43% would prescribe a statin
35% would prescribe both a statin and aspirin

Another 10% of people said they would prescribe a statin only if a dietary trial was unsuccessful.

Panel Comments

Although Ian is at very high risk for CVD drug treatment should be thought of as additional to lifestyle measures, not just as a replacement. Dietary advice including weight loss and adoption of a cardioprotective dietary pattern is appropriate for Ian. Physical activity is also important; a green prescription would be useful here. If his knee osteoarthritis is a barrier to physical activity low-impact activities such as swimming could be advised.

Aspirin and statin treatment are both appropriate for Ian, assuming his CV risk remains elevated above 15%. Some panel members thought statin treatment could be appropriate here without trying lifestyle measures first, as Ian is very high risk for CVD and statins may have beneficial endothelial effects beyond lipid lowering. Others thought it might be worthwhile treating his hypertension initially and trying lifestyle measures for a few months first. Attaining a blood pressure of < 145/85 would drop Ian's risk category by 5% to "high" (15-20%). All three-drug interventions (antihypertensive, aspirin and statin) should drop Ian's risk by 55% (NZGG 2003).

Obviously patient preference is also important when developing management plans; discussing absolute risk for CVD and reduction of this rather than relative risks should lead to more informed decision-making.

Q4. Drugs for secondary prevention:

Up to four drugs were specified by respondents.

4 drugs (ACE inhib, beta blocker, statin, aspirin):	34.5%
3 drugs (any combination- most commonly beta blocker, statin, aspirin):	43%
2 drugs (any combination-most commonly aspirin, beta blocker):	15%
1 drug (any drug, most commonly statin):	7%

In general people were less likely to note an ACE inhibitor than the other classes.

Panel comments

The use of aspirin, statins and beta-blockers was well recognized here. ACE inhibitors are also beneficial for secondary prevention post MI. ACE inhibitors are particularly indicated when there is LV dysfunction, however recent trials including HOPE and EUROPA have shown them to be of benefit in patients without LV dysfunction also.

Q5. Investigations:

Average number ordered = 5.

Most common:

CXR:	81%
Echocardiogram	68%
ECG:	56%
FBC:	49%
BNP:	48%
Cr or RENL:	42%
K, Na or U&E :	34%
TSH or TFTS:	34%
Glucose:	16%
MSU/urinalysis:	15%

There were many comments about the difficulty of obtaining echo's. Some would only refer for this if initial treatment failed, some mentioned an echo depending on BNP result.

Panel comments

As with any condition all tests should be ordered following a thorough history and examination.

We are not given specific examination findings in this case, but given Ian's history of smoking it is possible COPD could also be contributing to his symptoms, spirometry has a role here.

The gold standard test for diagnosing heart failure and its severity is an echo and attempts should be made to get one, access probably differs in different regions.

Panel members had differing views on the value of BNP testing. Some felt it could be a useful test in this situation, others were less enthusiastic and thought it was likely to be more use as a rule out test when the diagnosis is uncertain. More guidance on the role of BNP testing would be useful.

The other laboratory tests are appropriate for ruling out contributory causes of heart failure (e.g. hyperthyroidism, anaemia) and for baseline tests prior to initiating diuretic therapy.

Q6. INR range:

2-3 noted by 96.5% of respondents.

Panel comments

The vast majority of respondents were well aware of the recommended therapeutic range for warfarin in this situation. A related question not addressed in the case study is the initiation of warfarin therapy in the general practice setting. There are differing guidelines on this, but it is generally accepted the higher dose hospital regimens (e.g. 10mg, 10mg, 5mg) are less suitable in the primary care setting. "Lower and slower" regimens may be more appropriate, for example three days of a 5mg dose then checking the INR.

Q7. How often to check INR when stable:

2 weekly:	10%
4 weekly:	72%
6 weekly:	9.5%
Other:	8.5%, of these many noted longer intervals e.g. 8-12 weeks

Panel comments

Four weekly seems reasonable. Some guidelines suggest longer intervals can be acceptable: Australian guidelines advise up to 6 weekly, the BNF/British Society of Haematology advise up to 12 weekly. The longer intervals are appropriate only for patients who are very stable and who are well educated on the factors that can change their INR level (e.g. Changes in diet, intercurrent illness, other medication use).



Cardiologist Comments

The subject is a 60 year old man who on first sight may not be considered obviously at particular risk but whose absolute risk is indeed high when all relevant information is aggregated: male gender, age, previous smoker, family history, overweight, unfavourable lipid profile and TC:HDL ratio 6.0 with mild hypertension. This cluster of risk factors is extremely common and can be designated as an example of the metabolic syndrome with predisposition to diabetes and relatively premature cardiovascular disease, particularly as the waist circumference indicates likely central adiposity.

Overall a very vigorous management approach is required aimed at lowering the high absolute risk to 15% or less and preferably 10% over a reasonable period. Thus targets and priorities should be agreed and set with the subject at the outset with planned monitoring and follow-up.

A combination of lifestyle behavioural changes and medications will be required in most cases of this kind and need to be initiated in concert. There is the option of pursuing hygienic measures alone (diet change, increased physical activity and weight reduction) for 6 months or so to judge the response to such measures and the subsequent need for medication. Some people will respond very well to such measures alone and certainly this is the ideal if it can be achieved. Whether this approach is taken primarily or not should be a matter for discussion with the subject and incorporate the practitioner's realistic judgement of likely success. In most cases these measures will be combined with medication from the outset and the medications most appropriate for such a case of high risk primary prevention initially would be aspirin and thiazide. A statin is also a primary consideration but could be staged and reconsidered after allowance for a period of diet and physical activity response and weight reduction. There are certainly other reasonable options for treating the hypertension including a beta-blocker or ACE inhibitor.

For secondary prevention post MI, aspirin, statin, beta-blocker and ACE inhibitor are all of proven benefit and all should be considered, as the total risk reduction possible with such combination treatment is large. In the years ahead some or all of these we will combined in a polypill which should assist compliance - certainly aspirin and statin together seems practical and should be the first such combination treatment available. Beta-blocker and ACE inhibitor combinations will be more difficult because of titration requirements, possible side effects and blood pressure limitations.



Cardiologist Comments

For reliable assessment and accurate diagnosis of heart failure, the sensitivity and specificity of symptoms, signs and traditional investigations still remains limited. The new blood test BNP (brain natriuretic peptide) is becoming increasingly available and is particularly helpful in ruling out a diagnosis e.g. a normal BNP makes heart failure in the breathless patient extremely unlikely (ie high negative predictive value). A positive result if very high indicates heart failure but intermediate results can be falsely positive. The next step to assist diagnosis, characterise ventricular function and assist treatment decisions should be echocardiography. Acknowledging that there are still often difficulties in accessing echo, it can be extremely useful to guide management and local solutions should be sought to ensure availability. Nowadays for definite heart failure due to systolic dysfunction, standard treatment recommendations are for diuretic and combination neurohormonal blockade with ACE inhibitor and beta-blocker, together which improves outcomes substantially.

Professor Norman Sharpe
National Heart Foundation

For those interested in scoring their case:

Below is a possible marking schedule for this case. The "correct" answers are based on what the editor thought were the most appropriate responses according to evidence in the literature. This is of course open to some debate! Based on a sample of cases scored in this way the average mark was 13-14.

1. score 2 points for high risk or very high risk max. 2 points
2. score 2 points for thiazide diuretic
score 1 point for ACE or beta-blocker max. 2 points
3. score 1 point for aspirin
score 1 point for statin only if it is noted lifestyle measures should be tried first or concurrently max. 2 points
4. score 1 point each for :
aspirin
ACE inhibitor
Beta blocker
Statin max. 4 points

5. score 1/2 point each for:

CXR
ECG
Echo
CBC/Hb
CR
Albumin
TFT
BNP
Urinalysis

Also:
U & E
Glucose
Lipids
LFTS
PEFR/spirometry

(NZGG 2001)

(NICE/SIGN)

6. score 2 points for 2-3 max. 6 points
7. score 2 points for 4 weekly max. 2 points
score 2 points for 6 weekly
score 2 points if other is from 4-12 weeks max. 2 points

total=20