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Dr Peter Savill
BSc MBBS PGDipCard
GPwSI Cardiology, Southampton

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Chest pain of recent onset requires prompt diagnosis

AUTHOR
Dr Peter Savill
BSc MBBS PGDipCard
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Southampton

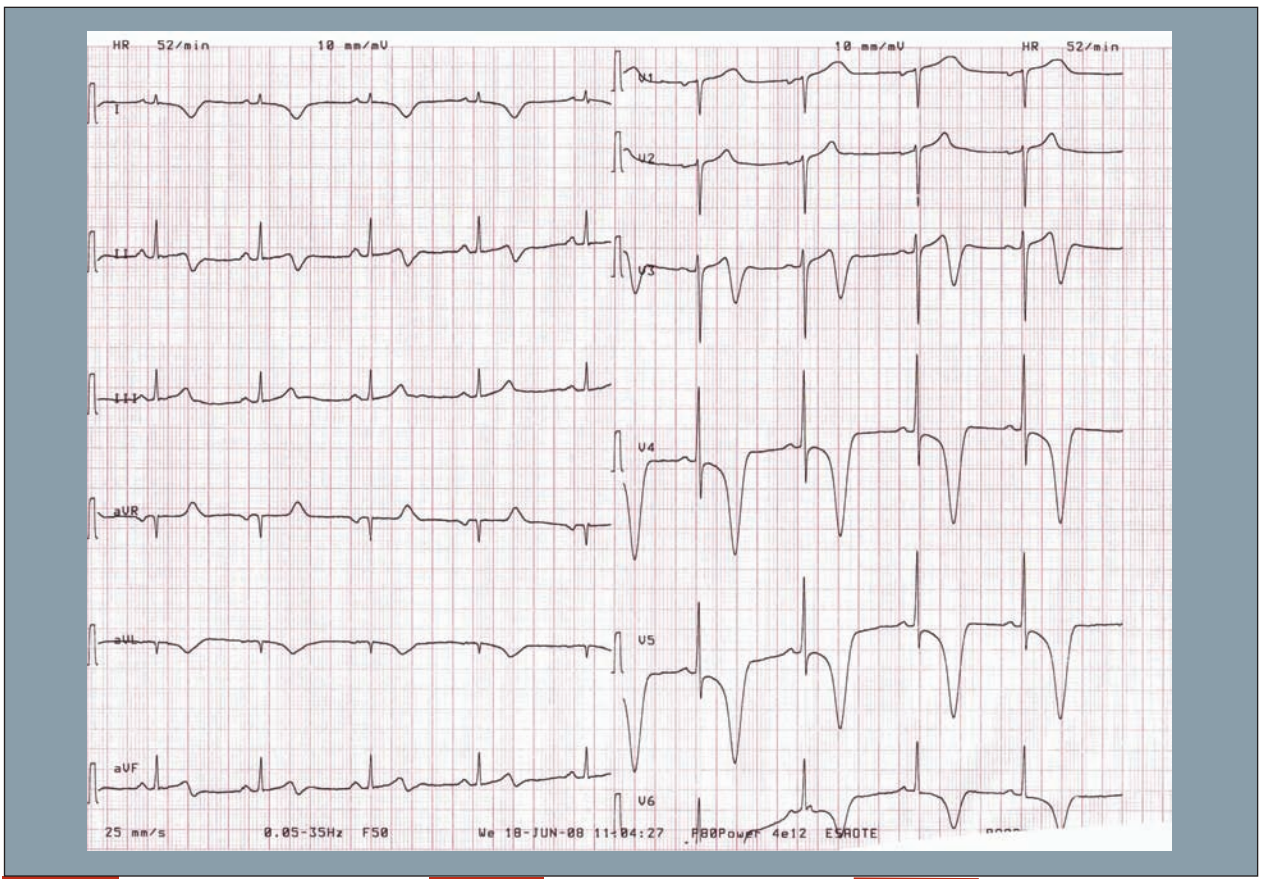


FIGURE 1
ECG showing deep and widespread T wave inversion, which in the context of chest pain, is suggestive of an acute coronary event

How should recent onset chest pain be assessed?

THE NEW NICE GUIDANCE ON RECENT ONSET CHEST PAIN URGES GPs TO ASSESS THE NATURE AND TIMING of acute pain rapidly and arrange urgent admission for suspected acute coronary syndrome (ACS).[1]

Key features of the presenting history are:

- pain in the chest and/or other areas (e.g. the arms, back or jaw) lasting longer than 15 minutes
- chest pain associated with nausea and vomiting, marked sweating breathlessness, or a combination of these
- chest pain associated with haemodynamic instability
- new onset chest pain, or abrupt deterioration in previously stable angina, with recurrent chest pain occurring frequently and with little or no exertion, and with episodes often lasting longer than 15 minutes

If any, or all, of these features are present ACS should be suspected. A 12-lead ECG should be performed and treatment commenced with 300 mg aspirin and GTN spray. Other pain relief such as opiates should be considered.

The routine use of oxygen is not advised unless supported by pulse oximetric evidence of desaturation (<94% in those not at risk of hypercapnic respiratory failure). This is welcome advice as there is no evidence to support the current widespread practice of giving oxygen to all patients with suspected ACS and indeed this may well lead to adverse outcomes.[2]

However, starting management and recording a resting ECG should not delay transfer to hospital and it is important to remember that ACS cannot be excluded by a normal resting 12-lead ECG. Patients should »

How should patients be managed initially?

What investigations should be carried out?

Box 1

Symptom classification for angina and non-anginal chest pain

The presence or absence of the following three factors should be noted:

- a constricting discomfort in the front of the chest, or in the neck, shoulders, jaw, or arms
- the discomfort is precipitated by physical exertion
- the discomfort is relieved by rest or GTN within about 5 minutes

All 3 factors present = typical angina
2 factors = atypical angina
1 or none of these factors = non-anginal chest pain

be monitored while awaiting transfer. The diagnosis and management of ACS is discussed in further detail in the accompanying article *Managing unstable angina and NSTEMI*, on p25.

STABLE CHEST PAIN

The stable chest pain component of the guideline has generated much debate. At present if a GP sees a patient with suspected angina a referral to a rapid access chest pain clinic is invariably the next step. The vast majority of rapid access clinics will be just that and patients will be seen within two weeks as laid down in the National Service Framework for Coronary Heart Disease.[3]

At these clinics patients will often undergo an exercise tolerance test to determine if they need further investigation for coronary disease.

The occasional patient will be felt to be at sufficiently high risk to warrant direct listing for angiography and others will not be suitable for exercise testing because of immobility, left bundle branch block (LBBB) on resting ECG etc. and an alternative functional test will be arranged.

Initial assessment

The new guidance suggests that GPs can diagnose stable angina either on clinical assessment alone or combined with diagnostic testing (anatomical testing for obstructive coronary disease and/or functional testing for myocardial ischaemia).

A diagnosis of angina is more likely with:

- a previous history of coronary disease
- increasing age
- male sex
- cardiovascular risk factors such as smoking, diabetes, hypertension, dyslipidaemia, family history of premature coronary disease
- the presence of other cardiovascular disease

NICE recommends that symptoms are classified into one of three groups depending on the presence or absence of three factors, see box 1, above.

Furthermore, non-anginal pain is more likely to be:

- continuous or very prolonged
- unrelated to activity
- pleuritic or
- associated with other symptoms such as dizziness, tingling or difficulty swallowing

If stable angina cannot be diagnosed, or excluded, on the basis of the clinical assessment alone a resting 12-lead ECG should be performed although NICE acknowledges that stable angina cannot be excluded on the basis of a normal resting 12-lead ECG. However, findings such as pathological Q waves, LBBB, ST segment and T wave abnormalities may indicate previous infarction or raise the suspicion of ischaemia.

Baseline blood tests should be arranged to exclude anaemia and thyroid disease as well as to establish the baseline lipid profile and exclude diabetes. A chest x-ray should only be considered if other diagnoses, such as a lung tumour are suspected.

Once this initial assessment is complete the guidance recommends estimating the likelihood of coronary disease based on risk factors, age, sex and the previously described symptom classification, see table 1, below. NICE points out that the risk calculations in table 1 are likely to overestimate CAD in primary care populations. If there are resting ECG ST-T changes or Q waves, the likelihood of CAD is higher.

Further investigation

If clinical assessment suggests typical angina and the estimated likelihood of coronary disease, based on table 1, below, is >90% NICE advises that further diagnostic investigation is unnecessary. These patients should be managed as having angina.

If clinical assessment suggests

Table 1

Percentage of people estimated to have significant CAD according to symptoms, age, sex and risk factors

	Non-anginal chest pain				Atypical angina				Typical angina			
Age	Men		Women		Men		Women		Men		Women	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
35	3	35	1	19	8	59	2	39	30	88	10	78
45	9	47	2	22	21	70	5	43	51	92	20	79
55	23	59	4	25	45	79	10	47	80	95	38	82
65	49	69	9	29	71	86	20	51	93	97	56	84

For men older than 70, assume an estimate > 90% and for women in this age group an estimate of 61-90% apart from women at high risk and with typical symptoms where a risk of > 90% should be assumed
High = high risk = diabetes, smoking and hyperlipidaemia (total cholesterol > 6.47 mmol/L)
Low = low risk = none of these three risk factors present

Adapted from National Institute for Health and Clinical Excellence. CG95. Chest pain of recent onset: Assessment and diagnosis of recent onset chest pain or discomfort of suspected cardiac origin. NICE. London. 2010

typical angina and the estimated likelihood of coronary disease is <10% then other non-ischaemic causes of chest pain should be considered.

In patients with known CAD in whom stable angina cannot be diagnosed or excluded based on clinical assessment alone functional testing should be considered as in the algorithm in figure 2, below.

In patients with no history of coronary artery disease in whom stable angina cannot be diagnosed or excluded based on clinical assessment alone, NICE advises further investigation based on the estimated likelihood of coronary disease:

- **61–90% risk:** invasive coronary angiography if considered appropriate
- **30–60% risk:** functional imaging: stress echo, myocardial perfusion scintigraphy or stress MRI
- **10–29% risk:** CT calcium scoring

Most significantly NICE does not recommend the use of exercise ECG testing to diagnose or exclude stable angina for people without known CAD.

Initiating treatment with low-dose aspirin is only advised for patients with suspected angina while further investigations are pending.

PRACTICAL IMPLICATIONS

This guidance is welcome in that it addresses the well known limitations of the exercise ECG in diagnosing or excluding coronary disease[4] and makes a case for using more accurate functional imaging techniques such as stress echo, myocardial perfusion imaging and stress MR.

Furthermore, it acknowledges the role of CT imaging as a risk assessment tool and as a complementary anatomical tool alongside the gold standard of invasive coronary angiography.

However, in the current economic climate this guidance may create more problems than it solves.

Exercise ECG has been relegated to the minor leagues and is only recommended as an option in patients with established coronary disease. This creates huge logistic, training and funding implications if alternative functional tests are to be used as first-line investigations. It would seem unlikely that rapid access chest pain clinics will be able to deliver their current levels of service without using treadmill tests.

This will be particularly pertinent in the district general hospital environment. I suspect even tertiary cardiac centres with access to the other imaging modalities will struggle to deliver timely investigations to the volume of patients coming through rapid access chest pain clinics.

PRIMARY CARE

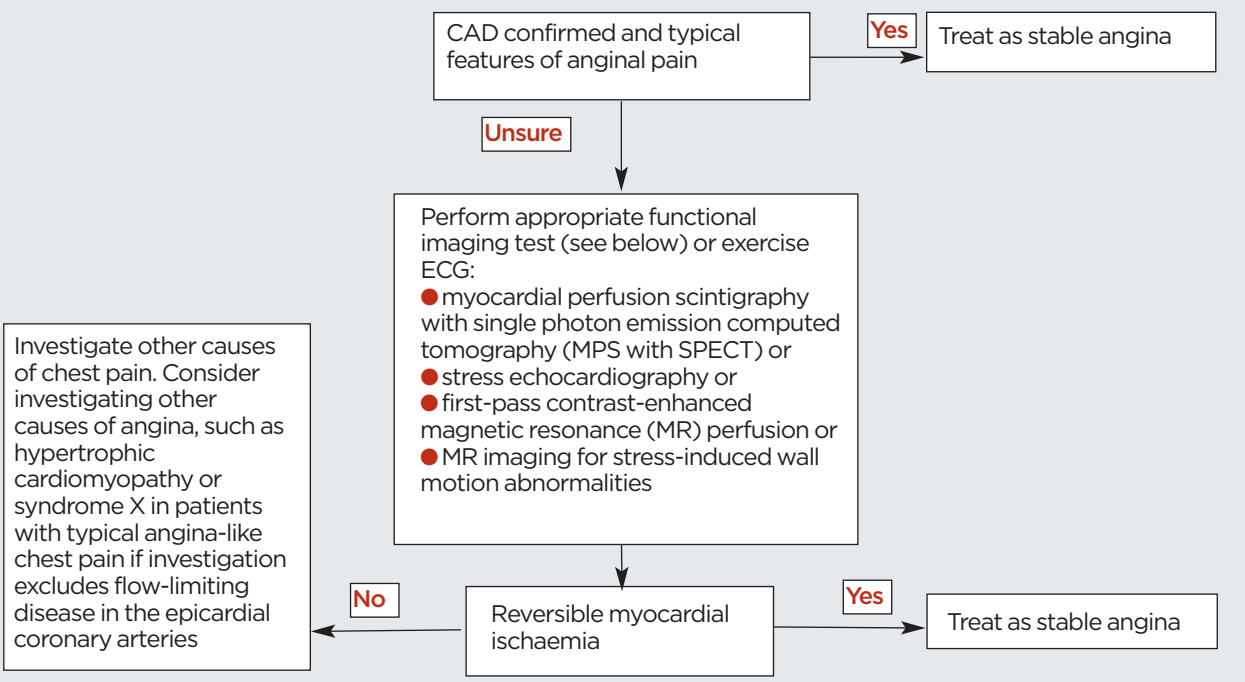
GPs may not be happy to use algorithms and risk tables to manage this group of patients and are likely to continue to rely on clinical judgement to decide who to refer for further tests.

They may also be uncomfortable making a diagnosis of angina and then not investigating this any further as recommended by the guideline for patients with typical angina and >90% probability of CAD.

Surely it is important in this group to exclude coronary disease in which revascularisation could improve prognosis e.g. triple vessel disease, left main stem/proximal LAD disease. Furthermore, this approach and the »

Figure 2

Investigation of stable chest pain in patients with established CAD



Adapted from National Institute for Health and Clinical Excellence. CG95. Chest pain of recent onset: Assessment and diagnosis of recent onset chest pain or discomfort of suspected cardiac origin. NICE. London. 2010

key points

SELECTED BY
Dr Peter Saul
GP, Wrexham and associate GP Dean for North Wales

The new NICE guidance on recent onset chest pain urges GPs to assess the nature and timing of acute pain rapidly and arrange urgent admission for suspected acute coronary syndrome. A 12-lead ECG should be performed and treatment commenced with 300mg aspirin and GTN spray. Other pain relief such as opiates should be considered. However, starting management and recording a resting ECG should not delay transfer to hospital. Patients should be monitored while awaiting transfer.

GPs can diagnose stable angina either on clinical assessment alone or combined with diagnostic testing (anatomical testing for obstructive coronary disease and/or functional testing for myocardial ischaemia). The presence or absence of the following three factors should be noted: a constricting discomfort in the front of the chest, or in the neck, shoulders, jaw, or arms; the discomfort is precipitated by physical exertion; the discomfort is relieved by rest or GTN within about 5 minutes. If all three factors are present the symptoms should be classified as typical angina, two factors atypical angina and one or none of these factors non-anginal chest pain.

Once the initial assessment is complete the guidance recommends estimating the likelihood of coronary disease based on risk factors, age, sex and symptom classification. If clinical assessment suggests typical angina and the estimated likelihood of coronary disease is >90%, NICE advises that further diagnostic investigation is unnecessary. These patients should be managed as having angina. If the estimated likelihood of coronary disease is <10% then other non-ischaemic causes of chest pain should be considered.

In patients with known CAD in whom stable angina cannot be diagnosed or excluded based on clinical assessment alone functional testing should be considered. In patients with no history of CAD in whom stable angina cannot be diagnosed or excluded based on clinical assessment alone, NICE advises further investigation based on the estimated likelihood of coronary disease. It does not recommend the use of exercise ECG testing to diagnose or exclude stable angina for people without known CAD.

Box 2

Quality and Outcomes Framework (2009/10)
Secondary prevention of coronary heart disease (CHD)
Diagnosis and initial management
CHD2. The percentage of patients with newly diagnosed angina (diagnosed after 1 April 2003) who are referred for exercise testing and/or specialist assessment. **7 points**

move away from exercise testing are at odds with the Quality and Outcomes Framework. The clinical indicator CHD 2, see box 2, above, requires such patients to be referred for exercise testing and/or specialist assessment.

CONCLUSION

The guidance is laudable in that it highlights the need to look closely at chest pain diagnostic pathways and in particular the provision of newer more accurate functional tests. It also emphasises the importance of accurate history taking and applies a sensible approach to management of the acute patient.

However, the use of more probability charts is not welcome and it is unclear if these have been validated in representative populations. Furthermore, these may lead to overinvestigation of this group of patients.

Finally, it will take time and resources to implement this guidance and I suspect that we have not seen the end of the exercise ECG just yet which in the right hands still has much to offer as a diagnostic and prognostic tool.

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1 National Institute for Health and Clinical Excellence. CG95. Chest pain of recent onset: Assessment and diagnosis of recent onset chest pain or discomfort of suspected cardiac origin. NICE. London. 2010
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3 National Service Framework for Coronary Heart Disease. Chapter 4 - Stable angina. DH. London. 2000
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Useful information

British Heart Foundation
www.bhf.org.uk

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