

New NICE guidelines for the management of stable angina

In November 2016, the National Institute for Health and Care Excellence (NICE) released an update of its 2010 Clinical Guideline CG95¹ on patients presenting with stable chest pain.² This article covers the main changes in the updated CG95, and comments on how GPs can expect the management of patients referred to a cardiology/rapid-access chest pain clinic (RACPC) to change.

CHEST PAIN ASSESSMENT

Accurate assessment of patients presenting with chest pain is challenging. The combination of a detailed clinical history of the pain, with concomitant risk factors provides the most accurate clinical assessment.^{3,4} The 2010 guidance used pre-test probability scoring to guide patient investigation and management. The 2016 NICE guidelines do not advocate this and rely on a purely qualitative approach because all those with a clinical suspicion of angina will be investigated the same way. Presenting symptoms are divided into ‘typical’ and ‘atypical’. ‘Typical’ chest pain is classified as including all three of the following features:

1. Constricting discomfort in the front of the chest, or in the neck, shoulders, jaw, or arms;
2. Precipitated by physical exertion; and
3. Relieved by rest or sublingual nitrate within approximately 5 minutes.

‘Atypical’ pain is suggested by any two of the above, whereas ‘non-anginal’ pain is described as one or fewer. In the event of pain being classified as ‘non-anginal’, a diagnosis of stable angina can be excluded unless other features within the history or the risk factor profile (Box 1) offers additional concerns.

Patients with typical or atypical angina should have a 12-lead ECG as first-line investigation, although sensitivity in the diagnosis of ischaemic heart disease is very low. Patients with typical symptoms, atypical symptoms with risk factors, or ECG changes consistent with coronary disease should be offered further investigation.

DIAGNOSTIC TESTING FOR CORONARY DISEASE

Initial assessment of patients referred to a RACPC is to rule out high-risk or unstable features from the clinical history. These include resting chest pain, features consistent with an acute coronary syndrome (ACS), or rapidly progressive symptoms. Such patients are managed according to the unstable angina/ACS section of the guideline.

Patients with stable symptoms should now be offered a 64-slice (or higher) CT coronary angiogram. This is quite a change compared with the 2010 guidance. The rationale for this is to reduce the number of patients undergoing invasive investigations that have relatively low diagnostic yield. In the new guidance, in the event of an inconclusive or positive result, a functional test is suggested, with either stress echocardiography, stress perfusion cardiovascular magnetic resonance (CMR), or nuclear perfusion imaging.⁵ Only if these tests also prove inconclusive, or are positive for proximal or extensive coronary disease, should a patient be offered invasive angiography.

COMPUTER TOMOGRAPHY CORONARY ANGIOGRAPHY

Computer tomography coronary angiography (CTCA) is an important non-invasive imaging modality in the assessment of coronary artery disease (CAD). CG95 refers to ‘64-slice (or above)’ CTCA; ‘64-slice’ simply describes scanners which generate 64 simultaneous ‘slices’ during a single rotation of the scanning apparatus. These are then processed to provide the detailed CT images. Faster heart rates limit image quality and therefore many patients are prescribed beta-blockers in the lead up to the test.

Advantages of CTCA

- Very high diagnostic sensitivity, that is, an excellent ‘rule out’ test.
- Non-invasive: safer than invasive coronary angiography.

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Box 1. Independent risk factors for coronary disease

- Known ischaemic heart disease.
- Smoking.
- Diabetes.
- Dyslipidaemia.
- Hypertension.
- Family history of coronary artery disease.

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- Provide 3D images, as compared with 2D images from traditional angiography.
- Approximately 1 in 20 cases⁶ will also incidentally identify other possible causes of chest pain, such as:
 - non-atheromatous disease of the coronary arteries, such as anomalous coronary arteries, coronary dissection, or coronary compression from other structures;
 - other cardiac disease (valvular disease or hypertrophic cardiomyopathy);
 - aortic pathology; and
 - pulmonary pathology (infection, mass/nodule, or pneumothorax).

Disadvantages of CTCA

- Determining whether a coronary stenosis is causing ischaemia is not currently possible.
- Uses intravenous iodine-based contrast with risks of allergy/anaphylaxis and contrast nephropathy.
- Requires small doses of ionising radiation.
- Obtaining high-quality images may be difficult in patients with high levels of coronary calcium and those with arrhythmias.
- Many hospitals do not have the capacity to accommodate the additional examinations the new guidance will generate.

FUNCTIONAL TESTING FOR CORONARY DISEASE

Imaging to assess myocardial ischaemia is achieved either by exercise or by pharmacological agents (vasodilators or chronotropic agents). In contrast with CTCA, functional testing does not directly image the coronary arteries, but provides evidence of ischaemia, which can be correlated to the usual myocardial territory. All three imaging methods can produce high sensitivity and specificity data on the presence of obstructive coronary disease, as long as adequate 'stress' is achieved. In those undergoing exercise or dobutamine stress, a heart rate of $\geq 85\%$ of the maximal predicted is required. In vasodilator stress, increases in heart rate, patient symptoms, and other factors are used.

Some preparation is required before the day of the test. With stress echocardiography, beta-blockers and other rate control drugs need to be stopped for 48 hours. For adenosine- and dipyridamole-based perfusion studies, caffeine needs to be avoided for 24 hours before the test as it interferes with the mechanism of action of these drugs. It is important to note that since 2010 the NICE guidelines no longer

recommend the use of the exercise ECG in the diagnosis of new coronary disease due to limited sensitivity and specificity.

STRESS/EXERCISE ECHOCARDIOGRAPHY

Stress echocardiography uses exercise (ESE) or dobutamine (DSE) to provide cardiac stress. In those who are able to, exercise is the preferred method in most centres in the UK. The main limitation is of image quality but better contrast agents have been developed to aid in this.

MPS/SPECT

This is the use of a radiolabelled contrast agent to identify areas of reduced perfusion when myocardium is stressed. This is achieved using either exercise or vasodilators (adenosine, regadenoson, or dipyridamole). The main limitations of the test are that it utilises ionising radiation and has limited sensitivity in females.

STRESS PERFUSION CMR

Stress perfusion CMR involves an infusion of adenosine followed by a bolus contrast injection (gadolinium). Occasionally, dobutamine stress CMR is performed (when there is a contraindication to adenosine such as severe asthma). The main limitations of CMR are of claustrophobia (although $<1\%$ of patients will not tolerate the scan), renal impairment (this is a contraindication to gadolinium administration), and/or any contraindication to having an MRI scan.

MANAGEMENT

Once a diagnosis of stable coronary disease is established, medical therapy is the first-line treatment (schema available from authors on request). Only in the event of refractory symptoms on maximal medical therapy or evidence of proximal or extensive disease on CTCA or functional imaging should an angiogram be offered.

CONCLUSIONS

Updated NICE guidance for chest pain investigation and management recommends a number of changes that are aimed to enhance patient care and be cost-effective. The new guidelines are now very different from those suggested by European and US societies. One of the objectives of the new guidelines is to reduce the use of invasive angiograms as the first-line investigation by promoting the use of non-invasive modalities as a filter. Implementation will produce significant increases in service demand on the cardiac imaging departments of hospitals in the UK, which some may not immediately be able to satisfy.