

Putting NICE guidance into practice

Clinical Guideline: Chest pain algorithm supporting document

Implementing the NICE guidelines on Unstable angina and NSTEMI (CG94), Chest pain of recent onset (CG95) and Stable angina (CG126)

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These presenter instructions support the chest pain algorithm (produced as a slide set) which accompany the clinical guidelines 'Unstable angina and NSTEMI' (available at: <http://guidance.nice.org.uk/CG94>), 'Chest pain of recent onset' (available at: <http://guidance.nice.org.uk/CG95>), and 'Stable angina' (available at: <http://guidance.nice.org.uk/CG126>).

Issue date: 2014

This is a support tool for implementation of the NICE guidance. These clinical case scenarios were reviewed in March 2014 for this third edition, alongside the associated slide set and case studies. Page 18 of this document, and slides 15 and 19 of the algorithm, have been updated to include reference to related NICE guidance published since the first edition.

It is not NICE guidance.

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Introduction

NICE clinical case scenarios

Clinical case scenarios are an educational resource that can be used for individual or group learning. Each question should be considered by the individual or group before referring to the answers.

These clinical case scenarios should be used alongside the chest pain algorithm, which has been produced in the form of a slide set. If you would like to share the whole of the algorithm with your audience, explore the boxes on each slide that are not applicable to the case before moving on to the boxes that are applicable. Letters are used throughout the algorithm to indicate what order the boxes should be explored. Hyperlinks in the slide set encourage you to explore all the possibilities in the algorithm. These cases follow the preset order of the algorithm so that the last hyperlink in each slide allows you to continue to follow the case. If you choose only to use the hyperlinks applicable to the case you will miss sections of the algorithm which are not relevant to that case.

These case scenarios cover a number of healthcare settings, including primary care, A&E, acute medical ward, rapid access chest pain clinics and cardiology departments. It is acknowledged that in reality patients see healthcare professionals in a range of settings. For the purpose of this tool the questions are posed to the audience as if they are the healthcare professional in all of the settings.

Each case scenario includes details of the person's initial presentation, their medical history and their care. Clinical decisions about diagnosis and management are then considered using a "question and answer" approach that relates to the algorithm and associated recommendations in the NICE guidance. However, in practice other factors may be taken into account when considering a person's care; care should always be approached holistically. Additionally, although not mentioned specifically in these cases, it is important to ensure that treatment and care take into account people's needs and preferences.

This document was written with the intention is that the questions on pages 5 to 9 should be printed and handed out to your audience and the answers and instructions on pages 10 to 26 are for the presenter use only.

Clinical case scenarios: questions

Case scenario 1: 65-year-old male, currently pain-free but experienced chest pain in the previous 12 hours

Presentation to GP

John, 65 years old, presents to your GP branch surgery at 0830.

He reports that he had chest pain last night, which woke him from his sleep. The pain started at around 0200. He thinks it lasted about 20–25 minutes. He reports that he felt sweaty during the pain. He did not want to bother anyone so he rested and the pain eased. He reports that it was very painful and therefore wanted to see you to get it checked.

He is currently not in any pain, although he feels quite tired.

Medical history

He has been a smoker for 40 years. On average, he has around 10 cigarettes a day. He has no past medical history of chest pain, ischemic heart disease or heart failure.

1.1 Question: As the GP, should you suspect acute coronary syndrome (ACS)? If so, why?

1.2 Question: What immediate management should you offer?

1.3 Question: You do not have an ECG machine at your branch surgery. Should you refer him to hospital? If so, how urgently?

Presentation to A&E

On admission at 1030 John's heart rate is 75 beats per minute (bpm) and his blood pressure is 127/80 mmHg. You conduct an initial assessment. Please note the initial assessment detailed in the chest pain algorithm should be applied to all people with suspected ACS. The timing of the assessment will vary depending on when the person last felt the pain.

During the initial assessment you identify the following:

Troponin T 0.02ug/L

Creatinine 0.9 mg/dL

1.4 Question: When should you repeat the troponin?

ECG: there is no regional ST elevation or presumed left bundle branch block (LBBB) and no ST-segment depression or deep T wave inversion suggestive of a non-ST-segment-elevation myocardial infarction (NSTEMI) or stable angina.

1.5 Question: What should you consider?

1.6 Question: What would increase suspicion of ACS?

1.7 Question: What should you monitor?

Admission to medical admissions ward

12 hours after symptom onset the troponin T is 0.15 ug/L.

1.8 Question: Can you diagnose ACS? If so, why?

1.9 Question: What protocol should you treat this patient according to?

1.10 Question: What early management should you offer this patient?

1.11 Question: What risk assessments should you consider?

1.12 Question: What factors should you include when predicting 6-month mortality and risk of future adverse cardiac events?

1.13 Question: You should carefully consider the choice and dose of antithrombin in patients who have a high risk of bleeding associated with which factors?

1.14 Question: What is John's predicted 6-month mortality?

1.15 Question: What medication and intervention should be offered to John?

1.16 Question: Who should you discuss the patient's management strategy with?

1.17 Question: How would you manage John's medication if he had been offered percutaneous coronary intervention (PCI)?

1.18 Question: How would you manage John's medication if he had been offered coronary artery bypass grafting (CABG)?

Case scenario 2: 72-year-old female, who experienced chest pain 3 days ago while walking

Presentation to GP

Jennifer is a 72-year-old female who reports experiencing chest pain 10 days ago while she was out walking. Her chest and left shoulder felt tight. She stopped walking and rested and the pain eased. She did not seek medical help at the time because she thought it was a stitch. She then experienced the same pain while out walking 3 days ago, which stopped when she sat down.

2.1 Question: You carry out a clinical assessment. What should you record and examine?

Explore box 5 and return to slide 24.

2.2 Question: Do you suspect stable angina?

You take a resting ECG. This is normal.

2.3 Question: Use table 1 on slide 27 of the slide set to estimate the likelihood of coronary artery disease (CAD) for Jennifer (note the text under the main table is relevant to Jennifer's case). What is your estimate of the likelihood of CAD?

Involvement of cardiology

Jennifer is referred to the local hospital cardiology clinic. Here you discuss coronary angiography and possible revascularisation with Jennifer. Clinically you feel that this is appropriate and acceptable, and she is in agreement. You offer invasive coronary angiography. This shows $\geq 50\%$ diameter stenosis in the left main coronary artery.

2.4 Question: Is this significant CAD and what do you do now?

2.5 Question: What information and support should you provide to Jennifer?

2.6 Question: When treating Jennifer you should take into account general principles for treating stable angina. What are these?

2.7 Question: What medication would you offer and what information should you provide with this?

2.8 Question: Over the course of a number of weeks you identify that Jennifer cannot tolerate calcium channel blockers and beta blockers. What should you do now and what should you consider when making this decision?

2.9 Question: Your choice of medication does not control her symptoms. You conclude that her symptoms are not satisfactorily controlled with the optimal drug treatments available to you (that is, those that are tolerated and not contraindicated). What other interventions could you consider?

2.10 Question: The revascularisation strategy you selected controlled Jennifer's symptoms. However, if it had not, you would have needed to re-evaluate the case. What would this include?

Clinical case scenarios: answers

These answers guide you through the slides to the answers. These cases are specific to only certain sections of the algorithm. If you would like to show the whole of the algorithm to your audience, explore the boxes on each slide that are not applicable to the case before moving on to the boxes that are applicable. Letters are used throughout the algorithm to indicate the order you need to follow to view the entire algorithm. Hyperlinks in the slide set encourage you to explore all the possibilities in the algorithm. These cases follow the preset order of the algorithm so that the last hyperlink in each slide allows you to continue to follow the case. If you choose only to use the hyperlinks applicable to the case you will miss sections of the algorithm which are not relevant to that case.

Where appropriate, text highlighted in grey is used to indicate text taken from the algorithm to provide the answer.

Case 1 answers

Presentation to GP

John, 65 years old, presents to your GP branch surgery at 0830.

He reports that he had chest pain last night, which woke him from his sleep. The pain started at around 0200. He thinks it lasted about 20–25 minutes. He reports that he felt sweaty during the pain. He did not want to bother anyone so he rested and the pain eased. He reports that it was very painful and therefore wanted to see you to get it checked.

He is currently not in any pain, although he feels quite tired.

Past medical history

He has been a smoker for 40 years. On average, he has around 10 cigarettes a day. He has no past medical history of chest pain, ischemic heart disease or heart failure.

Question 1.1: As the GP, should you suspect ACS? If so, why?

From the contents slide, select 'acute chest pain' and then select the 'checking for suspected ACS' link. The answer is behind this link.

Yes.

Check if the chest pain may be cardiac. Consider:

- history of the pain
- any cardiovascular risk factors – smoking
- history of ischaemic heart disease and any previous treatment
- previous investigations for chest pain.

Check if any of the following symptoms of ischaemia are present. These may indicate ACS:

- Pain in the chest and/or other areas (for example, the arms, back or jaw) lasting longer than 15 minutes. Over 20 minutes.
- Chest pain with nausea and vomiting, marked sweating or breathlessness (or a combination of these), or with haemodynamic instability. Reported sweatiness.
- New onset chest pain, or abrupt deterioration in stable angina, with recurrent pain occurring frequently with little or no exertion and often lasting longer than 15 minutes.

Question 1.2: What immediate management should you offer?

Return to slide 4 and select box 1. The answer is in box 1.

In the order appropriate to the circumstances, offer:

- pain relief (GTN and/or an intravenous opioid)
- a single loading dose of 300 mg aspirin unless the person is allergic. Send a written record with the person if given before arriving at hospital. Only offer other antiplatelet agents¹ in hospital

¹ Follow 'Unstable angina and NSTEMI' (NICE clinical guideline 94) or local protocols for ST-segment-elevation myocardial infarction (STEMI).

- a resting 12-lead ECG. If the person is referred, send the results to the hospital before they arrive, if possible
- other therapeutic interventions as necessary
- pulse oximetry, ideally before hospital admission. Offer oxygen:
 - if oxygen saturation (SpO₂) is less than 94% with no risk of hypercapnic respiratory failure. Aim for SpO₂ of 94–98%
 - to people with chronic obstructive pulmonary disease who are at risk of hypercapnic respiratory failure. Aim for SpO₂ of 88–92% until blood gas analysis is available.
- Monitoring. Include:
 - exacerbations of pain and/or other symptoms
 - pulse and blood pressure
 - heart rhythm
 - oxygen saturation by pulse oximetry
 - repeated resting 12-lead ECGs
 - checking pain relief is effective.
 Decide how often this should be done.

Question 1.3: You do not have an ECG machine at your branch. Should you refer him to hospital? If so, how urgently?

Return to slide 4 and select 'no current chest pain' and then 'chest pain in the last 12 hours'. The answer is located in slide 7.

If resting ECG is abnormal or unavailable you should refer the patient to hospital for an assessment as an emergency.

Presentation to A&E

On admission at 1030 John's heart rate is 75 bpm and his blood pressure is 127/80 mmHg. You conduct an initial assessment. Please note the initial assessment detailed in the chest pain algorithm should be applied to all people with suspected ACS. The timing of the assessment will vary depending on when the person last felt the pain.

During the initial assessment you identify the following:

Troponin T 0.02

Creatinine 0.9 mg/dL.

Question 1.4: When should you repeat the troponin?

You should return to slide 5, 'no current chest pain', and select the purple box, which moves you to the initial assessment slide 8. Select box 3 to find out what the clinical assessment involves. The answer to this question is on slide 8.

Repeat troponin 10–12 hours after symptom onset.

ECG: there is no regional ST elevation or presumed LBBB and no ST-segment depression or deep T wave inversion suggestive of a NSTEMI or stable angina.

Question 1.5: What should you consider?

On slide 8, click the 'yes/no' hyperlink to take you to slide 9. Then click the 'no' hyperlink. The answer is on slide 11.

Increase suspicion of an ACS if there are Q waves and T wave changes, even without ST-segment changes. Consider following the NICE unstable angina/NSTEMI algorithm if unstable angina or NSTEMI is likely.²

Question 1.6: What would increase suspicion of ACS?

The answer is on slide 11.

Consider taking serial ECGs, reviewing previous ECGs and recording additional leads.

Consider other life-threatening conditions (for example, pulmonary embolism, aortic dissection or pneumonia).

Question 1.7: What should you monitor?

The answer is in box 2.

- Include:
 - exacerbations of pain and/or other symptoms
 - pulse and blood pressure

² A shortcut to the management of unstable angina and NSTEMI is on slide 11. It is not recommended that this is used unless the presenter does not wish to continue to explore diagnosis of stable chest pain

- heart rhythm
- oxygen saturation by pulse oximetry
- repeated resting 12-lead ECGs
- checking pain relief is effective.

Decide how often this should be done.

Admission to medical admissions ward

12 hours after symptom onset the troponin T is 0.15 ug/L.

Question 1.8: Can you diagnose ACS? If so, why?

From slide 11 click to return to slide 9 and use the purple box 'move to diagnosis' to take you to slide 12. Select box 4.

Diagnosis of ACS can be made by:

- Detection of rise and/or fall of cardiac biomarkers (preferably troponin) with at least one value above the 99th percentile of the upper reference limit (yes troponin T was 0.15 ug/L. For the purpose of this case study, above 0.03 ug/L is considered to suggest myocardial ischaemia. Considering your local upper reference limit, is 0.15 ug/L suggestive of myocardial ischemia?), together with evidence of myocardial ischaemia with at least one of the following:
 - symptoms of ischaemia – chest pain lasting longer than 15 minutes and sweatiness with the pain
 - ECG changes indicative of new ischaemia (new ST-T changes or new LBBB)
 - development of pathological Q wave changes in the ECG
 - imaging evidence of new loss of viable myocardium or new regional wall motion abnormality.

Question 1.9: What protocol should you treat this patient according to?

Return to slide 12. The answer is on slide 12.

Follow the NICE unstable angina/NSTEMI guideline.

Question 1.10: What early management should you offer this patient?

Select the unstable angina/NSTEMI guideline link to take you to slide 13. The answers are on slide 13.

- Offer a single loading dose of 300 mg aspirin and continue aspirin indefinitely.
- Offer fondaparinux to patients without a high bleeding risk unless angiography is planned within 24 hours.
- Offer unfractionated heparin if angiography is likely within 24 hours.
- Carefully consider choice and dose of antithrombin for patients with a high bleeding risk (see box 11)
 - consider unfractionated heparin, with dose adjusted to clotting function, if creatinine > 265 micromoles per litre.

Question 1.11: What risk assessments should you consider?

Click 'continue' to take you to the next slide. The answer to this question is on slide 14.

- Use established scoring system such as GRACE to predict 6-month mortality and assess risk of future adverse cardiovascular events³. Assess bleeding risk and relevant comorbidity before considering treatments, and at each stage of management.

Question 1.12: What factors should you include when predicting 6-month mortality and risk of future adverse cardiac events?

Click box 10 on slide 14 to take you to the answer.

Factors to include when assessing risk with an established scoring system:

- Full clinical history (including age, previous MI, previous PCI or CABG).
- Physical examination (including blood pressure and heart rate).
- Twelve-lead resting ECG.
- Blood tests (such as troponin I or T, creatinine, glucose and haemoglobin).

³ Categories of risk are derived from the Myocardial Ischaemia National Audit Process (MINAP) database. More details are in the full guideline which is available at www.nice.org.uk/guidance/CG94/Guidance

Question 1.13: You should carefully consider the choice and dose of antithrombin in patients who have a high risk of bleeding associated with which factors?

Click the link to box 11 on slide 14 for the answer.

Factors associated with high bleeding risk:

- advancing age
- known bleeding complications
- renal impairment
- low body weight.

Question 1.14: What is John's predicted 6-month mortality?

Return to slide 14 and use the link to the GRACE calculator (or the established scoring system you use in your organisation) to calculate John's risk.

Using the hyperlinked GRACE scoring system, John's risk is 4% predicted mortality at 6 months.

Age 60–69 years

HR 70–80 bpm

SBP 120–139

CHF no heart failure

Select elevated cardiac enzymes.

It is possible you may have identified a slightly different predicted 6-month mortality if you used an alternative tool. For the purpose of this case, we are going to consider John to be at 'intermediate risk'.

Question 1.15: What medication and intervention should be offered to John?

Select 'intermediate risk' box to move forward to slide 19. The answer is on slide 19. Use the 'continue' button to move to slide 20. The answers to this question are on slides 19 and 20.

- Offer clopidogrel as a treatment option for up to 12 months to people who have had an NSTEMI, regardless of treatment.
- Balance potential reduction in ischaemic risk with risk of bleeding and consider:
 - adding a GPI (eptifibatide or tirofiban), or
 - bivalirudin as an alternative to the combination of a heparin plus a GPI if the patient is not on fondaparinux or a GPI and angiography is scheduled within 24 hours of admission.
- Offer coronary angiography (with follow-on PCI if indicated) within 96 hours of first admission unless contraindicated. Perform as soon as possible if patient is clinically unstable or at high ischaemic risk.

Question 1.16: Who should you discuss the patient's management strategy with?

The answer is on slide 20.

With the cardiologist and cardiac surgeons.

Click on the 'discuss with...' hyperlink to take you to slide 21.

Question 1.17: How would you manage John's medication if he had been offered PCI?

Select the 'PCI' link to take you to slide 22.

- Consider abciximab for patients not on a GPI (eptifibatide, tirofiban).
- Offer systemic unfractionated heparin (50–100 units/kg) to patients on fondaparinux.
- Consider bivalirudin as an alternative to the combination of a heparin plus a GPI for patients not on a GPI or fondaparinux.

Question 1.18: How would you manage John's medication if he had been offered CABG?

Return to slide 21 and then select the 'CABG' hyperlink to take you to slide 23.

Slide 23 contains the answer.

- Consider stopping clopidogrel 5 days before CABG in patients with low risk of adverse cardiovascular events.
- Discuss with surgeon whether to continue clopidogrel before CABG in patients with intermediate or higher risk of adverse cardiovascular events.

Return to slide 21 and use the hyperlink to return to the contents page.

Case 2 answers

Presentation to GP

Jennifer is a 72-year-old female who reports experiencing chest pain 10 days ago while she was out walking. Her chest and left shoulder felt tight. She stopped walking and rested and the pain eased. She did not seek medical help at the time because she thought it was a stitch. She then experienced the same pain while out walking 3 days ago, which stopped when she sat down.

Question 2.1: You carry out a clinical assessment. What should you record and examine?

From the contents page select 'stable chest pain'. Select box 5. The answers are in box 5.

- Clinical history. Record:
 - age and sex
 - pain characteristics, factors provoking and relieving the pain
 - associated symptoms
 - history of cardiovascular disease
 - cardiovascular risk factors.
- Physical examination.
 - Identify cardiovascular risk factors.
 - Look for signs of other cardiovascular disease.
 - Exclude:
 - ◇ non-coronary causes of angina (for example, severe aortic stenosis, cardiomyopathy)
 - ◇ other causes of chest pain.

Question 2.2: Do you suspect stable angina?

Return to slide 22 and explore box 6.

- Anginal pain is:
 - constricting discomfort in the front of the chest, neck, shoulders, jaw or arms – Jennifer reported pain in her chest and shoulder.
 - precipitated by physical exertion – Jennifer reported onset while walking.

- relieved by rest or GTN in about 5 minutes – pain was relieved by rest.
- People with typical angina have all of the above anginal pain features, people with atypical angina have two of the features and people with non-anginal chest pain have one or none of the features. Jennifer has typical angina symptoms.
- Do not define typical and atypical features of anginal and non-anginal chest pain differently in men and women or among ethnic groups.
- Factors making stable angina more likely:
 - increasing age – Jennifer is 72
 - whether the person is male
 - cardiovascular risk factors
 - a history of established CAD (for example, previous MI, coronary revascularisation).
- Stable angina is unlikely if the pain is: (none of these were described by Jennifer)
 - continuous or very prolonged **and/or**
 - unrelated to activity **and/or**
 - brought on by breathing in **and/or**
 - associated with dizziness, palpitations, tingling or difficulty swallowing.

You take a resting ECG. This is normal.

Question 2.3: Use table 1 to estimate the likelihood of CAD for Jennifer (note the text under the main table is relevant to Jennifer's case). What is your estimate of the likelihood of CAD?

Return to slide 24, and select 'yes' in the box labelled 'F' to take you to slide 27. Select the hyperlink to table 1.

For women older than 70, assume an estimate of 61–90%.

Involvement of cardiology

Jennifer is referred to the local hospital cardiology clinic. Here you discuss coronary angiography and possible revascularisation with Jennifer. Clinically you feel that this is appropriate and acceptable, and she is in agreement. You

offer invasive coronary angiography. This shows $\geq 50\%$ diameter stenosis in the left main coronary artery.

Question 2.4: Is this significant CAD and what do you do now?

Return to slide 27 and select the 'estimated likelihood of CAD 10–90%' hyperlink to take you to slide 30. On slide 30 select the '61–90%' hyperlink, labelled 'C' to take you to slide 34. On slide 34 select the 'yes' option to take you to slide 36. On slide 36 select the box 9 hyperlink.

Coronary artery disease. Significant CAD on invasive coronary angiography is $\geq 70\%$ diameter stenosis of at least one major epicardial artery segment or $\geq 50\%$ diameter stenosis in the left main coronary artery.

- Factors intensifying ischaemia. Such factors allow less severe lesions (for example, $\geq 50\%$) to produce angina:
 - reduced oxygen delivery: anaemia, coronary spasm
 - increased oxygen demand: tachycardia, left ventricular hypertrophy
 - large mass of ischaemic myocardium: proximally located lesions
 - longer lesion length.
- Factors reducing ischaemia. Such factors may make severe lesions ($\geq 70\%$) asymptomatic:
 - well-developed collateral supply
 - small mass of ischaemic myocardium: distally located lesions, old infarction in the territory of coronary supply.

Question 2.5: What information and support should you provide to Jennifer?

Return to slide 36 and then use the purple button to return to slide 30. Use the purple box labelled 'D' on slide 30 to take you to the stable angina algorithm, which starts in slide 37. On slide 37 select box 12, which contains the results.

Offer advice, information and support.

- Include the person's family or carers in discussions when appropriate.
- Explain stable angina, factors provoking it and its long-term course and management.

- Encourage questions and provide opportunities for the person to discuss concerns, ideas and expectations about their condition, prognosis and treatment.
- Explore and address any misconceptions about stable angina and its implications for daily activities, heart attack risk and life expectancy.
- Discuss the purpose, risks and benefits of treatment.
- Assess the need for lifestyle advice and psychological support. Offer interventions as necessary.
- Explore and address issues such as self-management skills, concerns about the impact of stress, anxiety or depression on angina, and physical exertion including sex.
- Advise the person to seek professional help if their angina suddenly worsens.

Question 2.6: When treating Jennifer you should take into account general principles for treating stable angina. What are these?

Return to slide 37. On slide 37 select box 13, which contains the answer.

General principles for treating stable angina.

- Do not:
 - exclude people from treatment based on their age alone
 - investigate or treat symptoms differently based on gender or ethnic group
 - offer vitamins or fish oil. Inform people there is no evidence that they help stable angina.

Question 2.7: What medication would you offer and what information should you provide with this?

The answer is on slide 37. Use boxes 14 and 15 to help.

- Offer a short-acting nitrate (see points below).
 - Advise people:
 - ◇ how to administer short-acting nitrates
 - ◇ to use immediately before planned exercise or exertion
 - ◇ that side effects such as flushing, headache and light-headedness may occur

- ◇ to sit down or hold on to something if feeling light-headed.
- When used to treat episodes of angina, advise people:
 - ◇ to repeat the dose after 5 minutes if the pain has not gone
 - ◇ to call an emergency ambulance if the pain has not gone 5 minutes after the second dose.
- Offer optimal drug treatment (one or two anti-anginal drugs as necessary plus drugs for secondary prevention of cardiovascular disease; see points below).
 - Optimal drug treatment:
 - ◇ Provide information about drugs in line with ‘Medicines adherence’ (NICE clinical guideline 76).
 - Anti-anginal drug treatment:
 - ◇ Advise people that anti-anginal drug treatment aims to prevent episodes of angina and secondary prevention aims to prevent cardiovascular events such as heart attack and stroke.
 - ◇ Discuss how side effects of drug treatment might affect daily activities, and the importance of taking drug treatment regularly.
 - ◇ Review response to treatment, including any side effects, 2–4 weeks after starting or changing drug treatment.
 - ◇ Titrate dosage against symptoms up to the maximum tolerable dosage.
 - Secondary prevention:
 - ◇ Consider aspirin 75 mg daily. Take into account risk of bleeding and comorbidities.
 - ◇ Consider angiotensin-converting enzyme (ACE) inhibitors for people with stable angina and diabetes. Offer or continue ACE inhibitors for other conditions, in line with the relevant NICE guidance.
 - ◇ Offer statins in line with ‘Lipid modification’ (NICE clinical guideline 67).
 - ◇ Offer treatment for high blood pressure in line with ‘Hypertension’ (NICE clinical guideline 34).
- Offer either a beta blocker or calcium channel blocker as first-line treatment, based on contraindications, comorbidities and the person’s preference.
- Do not routinely offer other anti-anginal drugs as first-line treatment.

Question 2.8: Over the course of a number of weeks you identify that Jennifer cannot tolerate calcium channel blockers and beta blockers. What should you do now and what should you consider when making this decision?

From slide 37, select 'no' to the question 'Are symptoms satisfactorily controlled and medication tolerated?' this will take you to slide 39. From here select 'both BB and CCB are contraindicated or not tolerated', labelled 'B', to take you to slide 48.

- If both beta blockers and calcium channel blockers are contraindicated or not tolerated, consider monotherapy with:
 - a long-acting nitrate or
 - ivabradine or
 - nicorandil or
 - ranolazine.

Decide which drug based on comorbidities, contraindications, person's preference and drug costs.

Question 2.9: Your choice of medication does not control her symptoms. You conclude that her symptoms are not satisfactorily controlled with the optimal drug treatments available to you (that is, those that are tolerated and not contraindicated). What other interventions could you consider?

Use the purple box on slide 48 'are symptoms satisfactory controlled' to take you to slide 49. Then select 'no' on slide 49.

- Consider revascularisation (coronary artery bypass graft [CABG] or percutaneous coronary intervention [PCI]).
- Offer coronary angiography to guide treatment strategy.
- Additional non-invasive or invasive functional testing may be needed⁴.
- Consider the risks and benefits of continuing drug treatment or performing revascularisation and provide information (see boxes 16 and 17).
- If the coronary anatomy is suitable and revascularisation is appropriate:
 - offer CABG if PCI is not appropriate

⁴ This partially updates recommendation 1.2 of 'Myocardial perfusion scintigraphy for the diagnosis and management of angina and myocardial infarction' (NICE technology appraisal guidance 73).

- offer PCI if CABG is not appropriate.
- If either CABG or PCI is appropriate:
 - offer PCI for anatomically less complex disease unless the person prefers CABG
 - take into account the potential survival advantage of CABG for people with multivessel disease who:
 - ◊ have diabetes or
 - ◊ are over 65 or
 - ◊ have anatomically complex three-vessel disease, with or without involvement of the left main stem.

Question 2.10: The revascularisation strategy you selected controlled Jennifer's symptoms. However, if it had not, you would have needed to re-evaluate the case. What would this include?

Return to slide 49 and then use the purple box to return to slide 39. On slide 39 use the link in the purple box labelled 'D' to take you to slide 52, which contains the answer to this question.

- If stable angina does not respond to drug treatment and/or revascularisation, re-evaluate. This may include:
 - exploring the person's understanding of their condition and the impact of symptoms on quality of life
 - reviewing the diagnosis and considering non-ischaemic causes of pain
 - reviewing drug treatment and considering future drug treatment and revascularisation options
 - acknowledging the limitations of further treatment
 - explaining how the person can manage their pain themselves
 - specific attention to the role of psychological factors in pain
 - developing skills to modify cognitions and behaviours associated with pain.
- Consider cardiac syndrome X in people with angiographically normal coronary arteries and continuing anginal symptoms:
 - continue drug treatment for stable angina if symptoms improve
 - do not routinely offer drugs for secondary prevention of cardiovascular disease.

Other implementation tools

NICE has developed tools to help organisations implement the clinical guidelines on 'Unstable angina and NSTEMI', 'Chest pain of recent onset' and 'Stable angina' (listed below). These are available on the NICE website (www.nice.org.uk/guidance/CG94, www.nice.org.uk/guidance/CG95, www.nice.org.uk/guidance/CG126).

Implementation tools available for all three guidelines

- Costing tools:
 - costing report to estimate the national savings and costs associated with implementation and
 - costing template to estimate the local costs and savings involved or
 - costing statement details of the likely costs and savings when the cost impact of the guideline is not considered to be significant
- Audit support for local clinical audit.
- Baseline assessment tool for identifying current practice and prioritising implementation of the guideline.
- Slides highlighting key messages for local discussion.

Additional implementation tools for CG94

- Online educational tool with interactive case histories to improve users' knowledge of the guidance.
- Questionnaire to help services collect information from patients about the care they received

Additional implementation tools for CG95

- Implementation advice on how to put the guidance into practice and national initiatives that support this locally.
- Online educational tool, using interactive case histories to improve users' knowledge of the guidance.
- Referral checklist for those coordinating the diagnostic pathway for people presenting with stable chest pain.

- Factsheet on calcium scoring for helping to clarify the role of CT calcium scoring in ruling out stable angina in people presenting with chest pain of suspected cardiac origin.
- Questionnaire to help services collect information from patients about the care they received

Additional implementation tool for CG126

- Factsheet on revascularisation for stable angina with further information supporting the development of the revascularisation recommendations for people whose stable angina is controlled on optimal medical management.

A practical guide to implementation, [How to put NICE guidance into practice: a guide to implementation for organisations](#), is also available.

Related NICE guidance

Please see slide 94 in the find out more section of the algorithm.