NICE National Institute for Health and Care Excellence

2019 surveillance of chest pain of recent onset: assessment and diagnosis (NICE guideline CG95)

Surveillance report

Published: 4 September 2019

www.nice.org.uk

Contents

Surveillance decision

We will not update the guideline on chest pain of recent onset: assessment and diagnosis.

Reasons for the decision

Topic experts suggested key areas to focus on in this surveillance review, including the use of coronary computed tomography angiography-derived fractional flow reserve (CT-FFR) and high-sensitivity troponins. Focused searches for new evidence were undertaken in these areas as part of this surveillance. The new evidence that was identified was not considered to impact on the recommendations in this guideline.

We identified ongoing research on high-sensitivity troponins, the GRACE risk score, delay in help-seeking behaviour for acute coronary syndrome (ACS), coronary computed tomography angiography (CCTA) in suspected or confirmed ACS, and CT-FFR. The publication status of these studies and any potential impact on guideline recommendations upon publication will be monitored.

Topic experts highlighted issues with the implementation of some recommendations from the 2016 update of the guideline on the use of CCTA in stable chest pain. The availability of suitable scanners and professionals were reported to pose difficulties with implementation of the recommendations. These issues were explored in this surveillance review (as detailed in implementation of the guideline). No evidence was identified indicating that any alternative diagnostic imaging test would have superior performance to CCTA in stable chest pain and so we considered there to be no potential impact on recommendations in this area. However, we will ensure that the information on implementation issues gathered in this surveillance review is disseminated through appropriate channels within NICE.

We also considered external correspondence received, which requested the inclusion of further guidance on diagnosis of aortic dissection in this guideline. In order to inform our consideration of this point, we consulted with the topic experts already engaged with this surveillance review and additional experts in emergency medicine. While the expert views we received on whether additional guidance should be included on diagnosis of aortic dissection were mixed, more experts overall considered that this would not be appropriate within this guideline. This issue is described in more detail in other sources of information.

We considered stakeholder consultation comments and added a further 7 studies from stakeholder feedback into the summary of evidence (see appendix A). This evidence was considered either to support existing recommendations or not provide direct evidence of whether any alternative diagnostic imaging test would have superior performance to CCTA in stable chest pain. Therefore, the evidence identified at surveillance was not considered to demonstrate potential impact on existing recommendations.

For further details and a summary of all evidence identified in surveillance, see appendix A.

Overview of 2019 surveillance methods

NICE's surveillance team checked whether recommendations in chest pain of recent onset: assessment and diagnosis (NICE guideline CG95) remain up to date.

The surveillance process consisted of:

- Feedback from topic experts via a questionnaire.
- A search for new or updated Cochrane reviews.
- Consideration of evidence from previous surveillance.
- Examining related NICE guidance and quality standards and NIHR signals.
- A search for ongoing research.
- Examining the NICE event tracker for relevant ongoing and published events.
- Literature searches to identify relevant evidence.
- Assessing the new evidence against current recommendations to determine whether to update sections of the guideline, or the whole guideline.
- Consulting on the proposal with stakeholders, except if we propose to update and replace the whole guideline.
- Considering comments received during consultation and making any necessary changes to the proposal.

For further details about the process and the possible update decisions that are available, see ensuring that published guidelines are current and accurate in developing NICE guidelines: the manual.

Evidence considered in surveillance

Search and selection strategy

We searched for new evidence related to specific parts of the guideline. These areas were

suggested by topic experts as the key areas to focus on in this surveillance review.

The diagnostic accuracy of high-sensitivity troponins in acute chest pain of suspected cardiac origin

Studies with unclear reference standard details were excluded. We found 7 studies in a search for cross-sectional and cohort studies published between 10 May 2016 and 24 April 2019.

The clinical effectiveness of high-sensitivity troponins in people with acute chest pain of suspected cardiac origin

We found 4 studies in a search for randomised controlled trials (RCTs) published between 10 May 2016 and 24 April 2019.

The diagnostic accuracy of computed tomography angiography with fractional flow reserve in stable or acute chest pain of suspected cardiac origin

Studies with unclear reference standard details were excluded. Only studies reporting per-patient analyses were included (in line with the guideline). We found 4 studies in a search for cross-sectional and cohort studies published between 21 May 2015 and 18 April 2019. The difference in the start dates for these searches reflect the difference in the start dates for the update searches for the acute chest pain and stable chest pain sections of the guideline.

We also included:

- 2 relevant studies from a total of 7 identified by topic experts
- 10 studies identified in previous surveillance in 2014
- 7 studies identified as ongoing at previous surveillance in 2014 that have subsequently published
- 7 studies identified in comments received during consultation on the 2019 surveillance review

From all sources, we considered 41 studies to be relevant to the guideline.

See appendix A for details of all evidence considered, and references.

Ongoing research

We checked for relevant ongoing research; of the ongoing studies identified, 6 were assessed as having the potential to change recommendations. Therefore, we plan to regularly check whether these studies have published results and evaluate the impact of the results on current recommendations as quickly as possible. These studies are:

- The LoDED study – safe & rapid chest pain management (ISRCTN86184521)
- UK GRACE Risk Score Intervention Study (ISRCTN29731761)
- Clinical and demographic characteristics associated with delay in help-seeking behaviour in patients with Acute Coronary Syndrome (HS&DR 13/10/40)
- The RAPID-CTCA trial (Rapid Assessment of Potential Ischaemic Heart Disease with CTCA) - The role of early CT Coronary Angiography in the evaluation, intervention and outcome of patients presenting to the Emergency Department with suspected or confirmed Acute Coronary Syndrome (HTA 13/04/108)
- Fractional Flow Reserve Derived From Computed Tomography Coronary Angiography in the Assessment and Management of Stable Chest Pain (FORECAST) study (NCT03187639)
- Evaluating Fractional Flow Reserve computed from Cardiac CT images (ISRCTN11449939)

Intelligence gathered during surveillance

Views of topic experts

We considered the views of topic experts who were recruited to the NICE Centre for Guidelines Expert Advisers Panel to represent their specialty. For this surveillance review, topic experts completed a questionnaire about developments in evidence, policy and services related to the guideline.

We sent questionnaires to 12 topic experts and received 6 responses.

Responding topic experts included consultant nurses, a general practitioner, and consultants in cardiology and cardiothoracic radiology.

The topic expert feedback was used to inform the selection of the areas for focused searches.

Key points highlighted in topic expert feedback included:

- Issues relating to implementation of recommendations on the use of coronary computed tomography angiography (CCTA), specifically regarding availability of suitable scanners and professionals. This feedback was included, alongside other information identified on implementation, in the summary of evidence in this surveillance review. These issues have been fed back to NICE's implementation team and will also be shared with other teams.
- CCTA-derived fractional flow reserve (CT-FFR) should be considered as a diagnostic approach. A focused search was performed in this surveillance review to identify any new relevant evidence in this area.
- Uncertainty around the impact of high-sensitivity troponin assay use on patient outcomes. A focused search was performed in this surveillance review to identify any new relevant evidence in this area.
- Need for further guidance on management of incidental findings from computed tomography (CT) scanning (for example lung lesions), which can be associated with anxiety in patients, and increased costs and resource use. No evidence was identified on this topic in this surveillance review.
- Need for the guideline to reinforce the importance of reducing lifelong radiation dose from scanning (no further details provided). No evidence was identified on this topic in this surveillance review but a stakeholder comment relating to this topic was made at consultation (see appendix B).
- Need for further guidance on avoidance of over-investigation in patients with frailty or many comorbidities. No evidence was identified on this topic in this surveillance review.

- European Society of Cardiology guidelines i) still use pre-test probability in assessment of stable chest pain, and ii) do not recommend any specific test to diagnose chest pain (no further details provided). No evidence was identified on this topic in this surveillance review but a stakeholder comment relating to this topic was made at consultation (see appendix B).

One topic expert in this surveillance review raised an issue with the current title of the guideline not being specific enough in terms of the population covered, that is, chest pain suspected to be cardiac in origin. It was commented that the title of the guideline should better reflect the intended content. We considered the most suitable approach to address this point, including the revision of the title to make it more specific and/or inclusion of additional explanatory text on the guidance overview page. We plan to amend the title of the guideline to reflect the content more clearly.

Implementation of the guideline

Topic expert feedback emphasised difficulties in implementation of the recommendations from the 2016 guideline update on the use of CCTA in stable chest pain.

The resource impact report produced in development of this guideline noted that the availability of suitable scanners and trained professionals may affect speed of implementation and that this resource impact should be considered locally.

A statement from the British Society of Cardiovascular Imaging, which provided details on challenges in provision of CCTA, was identified in this surveillance review. Hospital Episode Statistics data for 2017/18 were also analysed to explore the delivery of CCTA for people with chest pain in hospital trusts in England (copyright © 2019, the Health and Social Care Information Centre. Re-used with the permission of the Health and Social Care Information Centre. All rights reserved). Both sources of information confirmed the geographical variation in delivery of CCTA. There is no evidence from this surveillance to demonstrate that CCTA should no longer be recommended as a diagnostic tool.

An adoption support resource for HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography (NICE medical technologies guidance 32) has been described in the summary of evidence for this surveillance. The adoption of HeartFlow analysis for estimation of fractional flow reserve from CCTA is being supported as part of the Accelerated Access Collaborative. We will include a cross-reference in chest pain of recent onset: assessment and diagnosis to link to HeartFlow FFRCT for estimating

fractional flow reserve from coronary CT angiography to promote the Accelerated Access Collaborative.

The use of high-sensitivity troponin tests for early rule out of myocardial infarction is covered by myocardial infarction (acute): early rule out using high-sensitivity troponin tests (NICE diagnostics guidance 15), which is cross-referred to from chest pain of recent onset: assessment and diagnosis. This is another technology being supported by the Accelerated Access Collaborative.

The Accelerated Access Collaborative aims to help support the uptake of these technologies in practice.

Other sources of information

We considered all other correspondence received since the guideline was published.

Correspondence from a stakeholder organisation was received requesting that additional guidance on diagnosis of aortic dissection be considered as part of any potential update of this guideline. Topic experts were consulted on this issue, including topic experts engaged with this surveillance review and additional experts in emergency medicine.

Nine responses were received. Of these, 3 agreed with further inclusion of aortic dissection in this guideline, 5 considered that this was not appropriate for this guideline, and 1 response was unclear.

The topic experts who considered that additional guidance on diagnosis of aortic dissection should be included in the guideline commented on the potential lethality of the condition, the need for guidance on diagnosis and immediate treatment (including follow-up of inconclusive rises in high-sensitivity troponins, and medical management of type B dissection), variation in investigation pathways and imaging availability between settings, and value of addressing clinical questions, such as the role of bedside transthoracic echocardiography for non-invasive diagnosis, relevance of bilateral blood pressures in aortic dissection prediction, and diagnostic relevance of chest X-ray.

The topic experts who did not consider that additional guidance on diagnosis of aortic dissection should be included in this guideline noted that there was sufficient content on chest pain of suspected cardiac origin for a guideline on this area alone, that aortic dissection is a very rare differential diagnosis, and that it has a different pathology, with

differences in clinical urgency and presentation, and has a different diagnostic pathway to chest pain of suspected cardiac origin once aortic syndrome was suspected. It was also commented that there are several existing non-NICE guidelines and educational resources for acute aortic syndrome, and that, if further guidance on this condition was added to this guideline, then other potential causes of chest pain may also need to be considered for inclusion.

Therefore, while views received from topic experts were mixed, the majority view was that inclusion of further guidance on aortic dissection would not be appropriate within this guideline.

This issue was further explored following stakeholder consultation.

Views of stakeholders

Stakeholders are consulted on all surveillance reviews except if the whole guideline will be updated and replaced. Because this surveillance proposal was to not update the guideline, we consulted with stakeholders.

Overall, 11 stakeholders commented.

Five stakeholders agreed with the decision not to update the guideline. These included 3 royal colleges and 2 professional bodies.

Six stakeholders disagreed with the decision not to update the guideline. These included 1 patient organisation (which requested the inclusion of additional guidance on diagnosis of aortic dissection in this guideline), 1 professional body (which queried the use of CCTA as a first line non-invasive diagnostic imaging test for people with stable chest pain), and 4 commercial organisations. Of these 4 commercial organisations, 2 related to technologies covered by myocardial infarction (acute): early rule out using high-sensitivity troponin tests and 1 related to a technology covered by HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography. These high-sensitivity troponin tests and the HeartFlow technology are rapid uptake products covered by the Accelerated Access Collaborative.

Key points raised during stakeholder consultation included:

Need for guidance on aortic dissection

We had previously received correspondence from a patient organisation which repeated its view that there was a need for guidance on the diagnosis of aortic dissection. The organisation commented that this is a potentially fatal condition that can be difficult to differentiate from acute coronary syndromes (resulting in misdiagnosis) and requires a timely CT scan of the aorta for appropriate diagnosis and treatment. We had previously engaged with surveillance topic experts and emergency medicine experts on the need for further guidance on aortic dissection within this guideline. Mixed responses were received from experts, with the majority view being that further guidance on aortic dissection diagnosis was not appropriate within this guideline. However, based on the stakeholder feedback we reassessed this issue. We recognise that the need for timely and accurate diagnosis of aortic dissection is an important clinical issue but based on the majority view from expert engagement in this surveillance we do not consider that it would be appropriate to include further guidance within this guideline. We propose to explore the need for further NICE guidance on diagnosis of aortic dissection through our topic selection process.

Need to update the section of the guideline on the use of high-sensitivity troponins in people with acute chest pain

Two commercial organisations both commented that the section on the use of high-sensitivity troponins should be revised. As described above, these technologies are covered by myocardial infarction (acute): early rule-out using high-sensitivity troponin tests and the Accelerated Access Collaborative. Both stakeholders cited several publications in their responses. We considered the eligibility of these and propose to forward relevant evidence to the developers of myocardial infarction (acute): early rule out using high-sensitivity troponin tests for consideration in their next update of this guidance.

Need to update the section of the guideline on the use of CT-FFR in people with stable chest pain

One commercial organisation commented that CT-FFR should be included in this guideline for patients where CT coronary angiography has shown coronary artery disease of uncertain functional significance. This stakeholder also requested that this guideline should include a cross-reference link to HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography. As described above, the HeartFlow CT-FFR technology is covered by the Accelerated Access Collaborative. We assessed the eligibility

of the published studies cited in their comment. Three published studies on the use of CCTA were added to the summary of evidence (appendix A). These studies were supportive of existing recommendations on the use of CCTA in chest pain of recent onset: assessment and diagnosis. We propose to forward the identified relevant evidence on CT-FFR to the developers of HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography for consideration in their next review of this guidance. We also propose to include a cross-reference in chest pain of recent onset: assessment and diagnosis, to link to HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography.

The use of non-invasive imaging in people with stable chest pain

A professional organisation raised several issues relating to the recommendations on the use of CCTA in stable chest pain. Some of these comments queried the economic modelling approach used in the 2016 update of the guideline section on non-invasive imaging in people with stable chest pain. We have responded to these points in detail in appendix B. This stakeholder also suggested additional published studies, which we have considered. Of these, 3 RCTs were added to the summary of evidence (appendix A). These RCTs were CE-MARC 2, MR-INFORM and CorMicA. Since these 3 RCTs vary in interventions and comparators and neither evaluate the imaging test of interest directly against CCTA, it is considered that further evidence would be required to have potential impact on the recommendation to use CCTA as a first line diagnostic imaging test in people with stable chest pain (recommendation 1.3.4.3). A meta-analysis of individual patient data from diagnostic accuracy studies was also added to the summary of evidence (appendix A). This study from the COME-CCT Consortium confirmed the good diagnostic performance of CCTA but also concluded that the accuracy of CCTA for diagnosis of obstructive coronary artery disease was greatest when the pre-test probability was between 7% and 67%. However, this study did not provide any direct evidence of whether any alternative diagnostic imaging test would have superior performance to CCTA.

Therefore, the evidence identified at surveillance was not considered to impact on existing recommendations for the use of CCTA.

Lipid diagnosis and management

One commercial organisation indicated that this guideline should be updated to reflect issues related to lipid diagnosis and management. No recommendations in chest pain of recent onset specifically refer to lipid diagnosis or management. However, chest pain of

recent onset recommendations advise that if people have risk factors for cardiovascular disease then appropriate NICE guidance should be followed, cross-referring to the related guidance on cardiovascular disease and hypertension in adults. Therefore, this guideline already recommends that risk factors for cardiovascular disease be considered.

An updated 4th edition of the Universal Definition of Myocardial Infarction

Stakeholders flagged that the universal definition of myocardial infarction used in the guideline should be updated from the 3rd to the 4th edition. The 3rd universal definition of myocardial infarction is referenced in a footnote. We propose to revise this footnote by an editorial amendment.

Potential equality issues

Equality issues were raised in stakeholder feedback, which are addressed in the equalities section.

See appendix B for full details of stakeholders' comments and our responses.

See ensuring that published guidelines are current and accurate in developing NICE guidelines: the manual for more details on our consultation processes.

Equalities

Stakeholder views on potential equalities issues were identified during the surveillance consultation process and included:

- Issues relating to the use of sex-specific cut-offs for the use of high-sensitivity troponins. Evidence on this point will be referred to the developers of myocardial infarction (acute): early rule out using high-sensitivity troponin tests for consideration in their next update of this guidance.
- The ability of non-invasive tests to detect causes of stable chest pain between sexes. The study provided in support of this view was included in the summary of evidence but was not considered to have potential impact on existing recommendations.

Editorial amendments

We received topic expert feedback that the current title of the guideline is not specific enough in terms of the population covered, i.e. chest pain suspected to be cardiac in origin. We considered the most suitable approach to address this point, including the revision of the title to make it more specific or inclusion of additional explanatory text on the guidance overview page.

We plan to amend the title of the guideline to reflect the content more clearly. A potential revision of the guideline title is: 'Recent-onset chest pain of suspected cardiac origin: assessment and diagnosis.'

Stakeholders suggested that the universal definition of myocardial infarction used in the guideline should be updated from the 3rd edition (published 2012) to the 4th edition (published 2018). The 3rd universal definition of myocardial infarction is referenced in a footnote. We propose to revise the reference in this footnote by an editorial amendment.

We also propose to include a cross-reference in this guideline to link to HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography.

Overall decision

After considering all evidence and other intelligence and the impact on current recommendations, we decided that no update is necessary.

ISBN: 978-1-4731-3548-2