

Draft

Acute Chest Pain (update)

Search strategies appendix

NICE guideline

Appendices

1 June 2016

Draft

*Commissioned by the National Institute for
Health and Care Excellence*

Disclaimer

Healthcare professionals are expected to take NICE guidelines fully into account when exercising their clinical judgement. However, the guidance does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of each patient, in consultation with the patient and, where appropriate, their guardian or carer.

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Appendix A: Literature search strategies

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Search strategies used for the acute chest pain guideline are outlined below and were run in accordance with the methodology in the NICE guidelines manual (2014).{NICE2014} All searches were run up to 10 May 2016 unless otherwise stated. Any studies added to the databases after this date (even those published prior to this date) were not included unless specifically stated in the text. Electronic, ahead of print or 'online early' publications are not routinely searched for. Where possible searches were limited to retrieve material published in English.

Table 1: Database date parameters

Database	Dates searched
Medline	1946 – 10 May 2016
Embase	1974 – 10 May 2016
The Cochrane Library	Cochrane Reviews to 2016 Issue 4 of 12 CENTRAL to 2015 Issue 2 of 12 DARE to 2016 Issue 4 of 4 HTA to 2016 Issue 2 of 4 NHSEED to 2015 Issue 2 of 4

Searches for the **clinical reviews** were run in Medline (OVID), Embase (OVID) and the Cochrane Library (Wiley).

Searches for **intervention and diagnostic studies** were usually constructed using a PICO format where population (P) terms were combined with Intervention (I) and sometimes Comparison (C) terms. An intervention can be a drug, a procedure or a diagnostic test. Outcomes (O) are rarely used in search strategies for interventions. Search filters were also added to the search where appropriate.

Searches for the health economic reviews were run in Medline, Embase, the NHS Economic Evaluations Database (NHS EED) and the Health Technology Assessment (HTA). NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD).

For Medline and Embase an economic filter (instead of a study type filter) was added to the same clinical search strategy.

A.2 Population search strategies

A.2.1 Standard acute chest pain population

Medline search terms

1.	exp Chest Pain/
2.	chest pain.ti,ab.
3.	exp Angina Pectoris/
4.	angina.ti,ab.
5.	((unstable or acute) adj3 coronary).ti,ab.
6.	acute coronary syndrome*.ti,ab.
7.	exp Myocardial Infarction/
8.	(acute adj3 (heart or myocardial) adj (infarct* or ischaemi* or ischemi*)).ti,ab.
9.	(coronary adj (heart or arter*) adj (disease or syndrome*)).ti,ab.
10.	or/1-9

Embase search terms

1.	exp Thorax Pain/
2.	chest pain.ti,ab.
3.	exp Angina Pectoris/
4.	angina.ti,ab.
5.	((unstable or acute) adj3 coronary).ti,ab.
6.	acute coronary syndrome*.ti,ab.
7.	exp Heart Infarction/
8.	(acute adj3 (heart or myocardial) adj (infarct* or ischaemi* or ischemi*)).ti,ab.
9.	exp Coronary Artery Disease/
10.	(coronary adj (heart or arter*) adj (disease or syndrome*)).ti,ab.
11.	or/1-10

Cochrane search terms

#1.	MeSH descriptor: [Chest Pain] explode all trees
#2.	chest pain:ti,ab
#3.	MeSH descriptor: [Angina Pectoris] explode all trees
#4.	angina:ti,ab
#5.	((unstable or acute) next/3 coronary):ti,ab
#6.	acute coronary syndrome:ti,ab
#7.	MeSH descriptor: [Myocardial Infarction] explode all trees
#8.	(acute next/3 (heart or myocardial) next (infarct* or ischaemi* or ischemi*)):ti,ab
#9.	(coronary next (heart or arter*) next (disease or syndrome*)).ti,ab
#10.	{or #1-#9}

CRD search terms

#1.	MeSH DESCRIPTOR Chest Pain EXPLODE ALL TREES
#2.	MeSH DESCRIPTOR Angina Pectoris EXPLODE ALL TREES
#3.	(angina)
#4.	((unstable or acute) ADJ3 (chest pain or coronary))
#5.	(acute coronary syndrome)
#6.	MeSH DESCRIPTOR myocardial infarction EXPLODE ALL TREES
#7.	(acute ADJ3 (heart or myocardial) ADJ (infarct* or ischaemi* or ischemi*))
#8.	(coronary ADJ (heart or arter*) ADJ (disease or syndrome*))
#9.	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8

A.3 Study filter search terms

A.3.1 Excluded study designs and publication types

The following study designs and publication types were removed from retrieved results using the NOT operator.

Medline search terms

1.	letter/
2.	editorial/
3.	news/
4.	exp historical article/
5.	anecdotes as topic/
6.	comment/
7.	case report/
8.	(letter or comment*).ti.
9.	or/1-8
10.	randomized controlled trial/ or random*.ti,ab.
11.	9 not 10
12.	animals/ not humans/
13.	exp animals, laboratory/
14.	exp animal experimentation/
15.	exp models, animal/
16.	exp rodentia/
17.	(rat or rats or mouse or mice).ti.
18.	or/11-17

Embase search terms

1.	letter.pt. or letter/
2.	note.pt.
3.	editorial.pt.
4.	case report/ or case study/
5.	(letter or comment*).ti.
6.	or/1-5
7.	randomized controlled trial/ or random*.ti,ab.
8.	6 not 7

9.	animal/ not human/
10.	nonhuman/
11.	exp animal experiment/
12.	exp experimental animal/
13.	animal model/
14.	exp rodent/
15.	(rat or rats or mouse or mice).ti.
16.	or/8-15

A.3.2 Randomised controlled trials (RCT)

Medline search terms

1.	randomized controlled trial.pt.
2.	controlled clinical trial.pt.
3.	randomi#ed.ti,ab.
4.	placebo.ab.
5.	randomly.ab.ti
6.	clinical trials as topic.sh.
7.	trial.ti.
8.	or/1-7

Embase search terms

1.	random*.ti,ab.
2.	factorial*.ti,ab.
3.	(crossover* or cross over*).ti,ab.
4.	((doubl* or singl*) adj blind*).ti,ab.
5.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
6.	crossover procedure/
7.	single blind procedure/
8.	randomized controlled trial/
9.	double blind procedure/
10.	or/1-9

A.3.3 Systematic reviews (SR)

Medline search terms

1.	meta-analysis/
2.	meta-analysis as topic/
3.	(meta analy* or metanaly* or metaanaly*).ti,ab.
4.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
5.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
7.	(search* adj4 literature).ab.
8.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9.	cochrane.jw.
10.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.

11.	or/1-10
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Embase search terms

1.	systematic review/
2.	meta-analysis/
3.	(meta analy* or metanaly* or metaanaly*).ti,ab.
4.	((systematic or evidence) adj3 (review* or overview*)).ti,ab.
5.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
7.	(search* adj4 literature).ab.
8.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9.	cochrane.jw.
10.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
11.	or/1-10

A.3.4 Health economic studies (HE)

Medline search terms

1.	economics/
2.	value of life/
3.	exp "costs and cost analysis"/
4.	exp economics, hospital/
5.	exp economics, medical/
6.	economics, nursing/
7.	economics, pharmaceutical/
8.	exp "fees and charges"/
9.	exp budgets/
10.	budget*.ti,ab.
11.	cost*.ti.
12.	(economic* or pharmaco?economic*).ti.
13.	(price* or pricing*).ti,ab.
14.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
15.	(financ* or fee or fees).ti,ab.
16.	(value adj2 (money or monetary)).ti,ab.
17.	or/1-16

Embase search terms

1.	health economics/
2.	exp economic evaluation/
3.	exp health care cost/
4.	exp fee/
5.	budget/
6.	funding/
7.	budget*.ti,ab.
8.	cost*.ti.
9.	(economic* or pharmaco?economic*).ti.

10.	(price* or pricing*).ti,ab.
11.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
12.	(financ* or fee or fees).ti,ab.
13.	(value adj2 (money or monetary)).ti,ab.
14.	or/1-13

A.3.5 Diagnostic test accuracy studies (DIAG)

Medline search terms

1.	exp "sensitivity and specificity"/
2.	(sensitivity or specificity).ti,ab.
3.	((pre test or pretest or post test) adj probability).ti,ab.
4.	(predictive value* or ppv or npv).ti,ab.
5.	likelihood ratio*.ti,ab.
6.	likelihood function/
7.	(roc curve* or auc).ti,ab.
8.	(diagnos* adj3 (performance* or accurac* or utilit* or value* or efficien* or effectiveness)).ti,ab.
9.	gold standard.ab.
10.	or/1-9

Embase search terms

1.	exp "sensitivity and specificity"/
2.	(sensitivity or specificity).ti,ab.
3.	((pre test or pretest or post test) adj probability).ti,ab.
4.	(predictive value* or ppv or npv).ti,ab.
5.	likelihood ratio*.ti,ab.
6.	(roc curve* or auc).ti,ab.
7.	(diagnos* adj3 (performance* or accurac* or utilit* or value* or efficien* or effectiveness)).ti,ab.
8.	diagnostic accuracy/
9.	diagnostic test accuracy study/
10.	gold standard.ab.
11.	or/1-10

A.4 Searches for specific questions

A.4.1 Non-invasive testing

- In people under investigation for acute chest pain of suspected cardiac origin, what is the clinical and cost-effectiveness of non-invasive imaging compared to standard practice, when each is followed by the appropriate treatment for NSTEMI/unstable angina, in order to improve patient outcomes?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2

4.	Limit 3 to English language
5.	Echocardiography, Stress/
6.	((echocardiogra* or echo) adj3 (stress or resting or nonstress or 2d or 2 dimension* or two dimension* or contrast)).ti,ab.
7.	(cardiac adj3 stress).ti,ab.
8.	Exercise Test/
9.	((exercise or treadmill or bicycle or stress) adj3 test*).ti,ab.
10.	((physical or chemical or pharmacolog* or nuclear) adj2 stress).ti,ab.
11.	exp magnetic resonance imaging/
12.	magnet* resonance.ti,ab.
13.	(MR*1 or NMR*1 or cmr* or (magnet* adj3 (tomogra* or imag* or scan* or perfusion or angiograph*)).ti,ab.
14.	exp Chest Pain/ri [Radionuclide Imaging]
15.	Myocardial Perfusion Imaging/
16.	(myocardial adj2 (perfusion or scintigraphy)).ti,ab.
17.	((myocardial or mp or mps) adj3 (imag* or scan*)).ti,ab.
18.	exp Positron-Emission Tomography/
19.	((photon or positron) adj3 (emission or tomograph*)).ti,ab.
20.	(spect or mpi or pet or petscan*).ti,ab.
21.	Tomography, X-Ray Computed/
22.	((x-ray or radiograph* or compute*) adj3 tomograph*).ti,ab.
23.	Coronary Angiography/
24.	(compute* or ct or tomograph*).ti,ab.
25.	49 and 50
26.	((compute* or ct or tomograph*) adj3 angiograph*).ti,ab.
27.	Multidetector Computed Tomography/
28.	((multislice or multi slice or multisection or multidetect*) adj2 (ct or compute* or tomograph*)).ti,ab.
29.	('64' adj3 (scan* or ct or compute* or tomograph*)).ti,ab.
30.	((heart or cardiac or myocardial or imag* or scan* or diagnos*) adj2 (ct or cat)).ti,ab.
31.	(cta or ccta or tro-cta or msct).ti,ab.
32.	or/5-22,25-31
33.	4 and 31
34.	Study filters RCT [A.3.2] or SR [A.3.3] or DIAG [A.3.5]
35.	33 and 34
	Date parameters: 1999 - 10 May 2016

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	exercise electrocardiography/
6.	((echocardiogra* or echo) adj3 (stress or resting or nonstress or 2d or 2 dimension* or two dimension* or contrast)).ti,ab.
7.	(cardiac adj3 stress).ti,ab.

8.	exercise test/
9.	((exercise or treadmill or bicycle or stress) adj3 test*).ti,ab.
10.	((physical or chemical or pharmacolog* or nuclear) adj2 stress).ti,ab.
11.	exp nuclear magnetic resonance imaging/
12.	magnet* resonance.ti,ab.
13.	(MR*1 or NMR*1 or cmr* or (magnet* adj3 (tomogra* or imag* or scan* or perfusion or angiograph*)).ti,ab.
14.	myocardial perfusion imaging/
15.	(myocardial adj2 (perfusion or scintigraphy)).ti,ab.
16.	((myocardial or mp or mps) adj3 (imag* or scan* or stress)).ti,ab.
17.	exp positron emission tomography/
18.	((photon or positron) adj3 (emission or tomograph*)).ti,ab.
19.	(spect or mpi or pet or petscan*).ti,ab.
20.	tomography/
21.	((x-ray or radiograph* or compute*) adj3 tomograph*).ti,ab.
22.	angiography/
23.	(ct or computer* or tomograph*).ti,ab.
24.	47 and 48
25.	((compute* or ct or tomograph*) adj2 angiograph*).ti,ab.
26.	multidetector computed tomography/
27.	((multislice or multi slice or multisection or multidetect*) adj2 (ct or computer* or tomograph*)).ti,ab.
28.	('64' adj3 (scan* or ct or compute* or tomograph*)).ti,ab.
29.	((heart or cardiac or myocardial or imag* or scan* or diagnos*) adj2 (ct or cat)).ti,ab.
30.	(cta or ccta or tro-cta or msct).ti,ab.
31.	or/5-21,24-30
32.	4 and 31
33.	Study filters RCT [A.3.2] or SR [A.3.3] or DIAG [A.3.5]
34.	32 and 33
	Date parameters: 1999 - 10 May 2016

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [Echocardiography, Stress] this term only
#3.	((echocardiogra* or echo) next/3 (stress or resting or nonstress or 2d or 2 dimension* or two dimension* or contrast)):ti,ab
#4.	(cardiac next/3 stress):ti,ab
#5.	MeSH descriptor: [Exercise Test] this term only
#6.	((exercise or treadmill or bicycle or stress) next/3 test*):ti,ab
#7.	((physical or chemical or pharmacolog* or nuclear) next/2 stress):ti,ab
#8.	MeSH descriptor: [Magnetic Resonance Imaging] explode all trees
#9.	magnet* resonance:ti,ab
#10.	MRI or MRS or NMRI or cmr*:ti,ab
#11.	(magnet* next/3 (tomogra* or imag* or scan* or perfusion or angiograph*)):ti,ab
#12.	MeSH descriptor: [Chest Pain] explode all trees and with qualifier(s): [Radionuclide imaging - RI]

#13.	MeSH descriptor: [Myocardial Perfusion Imaging] this term only
#14.	(myocardial next/2 (perfusion or scintigraphy)):ti,ab
#15.	((myocardial or mp or mps) next/3 (imag* or scan* or stress)):ti,ab
#16.	MeSH descriptor: [Positron-Emission Tomography] this term only
#17.	((photon or positron) next/3 (emission or tomograph*)):ti,ab
#18.	(spect or mpi or pet or petscan*):ti,ab
#19.	MeSH descriptor: [Tomography, X-Ray] explode all trees
#20.	((x-ray or radiograph* or compute*) next/3 tomograph*):ti,ab
#21.	MeSH descriptor: [Coronary Angiography] this term only
#22.	(compute* or ct or tomograph*):ti,ab
#23.	#21 and #22
#24.	((compute* or ct or tomograph*) next/2 angiograph*):ti,ab
#25.	MeSH descriptor: [Multidetector Computed Tomography] this term only
#26.	((multislice or multi slice or multisection or multidetect*) next/2 (ct or compute* or tomograph*)):ti,ab
#27.	((heart or cardiac or myocardial or imag* or scan* or diagnos*) next/2 (ct or cat)):ti,ab
#28.	(cta or ccta or tro-cta or msct):ti,ab
#29.	{or #2-#20, #23-#28}
#30.	#1 and #29
	Date parameters: 1999 – 10 May 2016

A.4.2 High-sensitivity troponins

- In low, medium and high risk people under investigation for acute chest pain of suspected cardiac origin, what is the accuracy of high-sensitivity troponin assay methods compared to conventional cardiac troponins to identify/rapidly rule out NSTEMI/unstable angina compared to standard cardiac troponins?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	Troponin/
6.	troponin i/ or troponin t/
7.	(sensitiv* or hs or early or initial or rapid or present* or ultra or high performance or ultrasensitive).ti,ab.
8.	(5 or 6) and 7
9.	((troponin* or tnt or ctn or tropt or trop t or tni or ctni or tropl or trop l) adj2 (sensitiv* or hs or early or initial or rapid or present* or ultra or high performance or ultrasensitive)).ti,ab.
10.	(troponin* adj5 (architect or elecsys or accutni or accu-tni or access or unicel)).ti,ab.
11.	(hs?tnt or hs-?tnt or tnt-hs or tnths or ctnths or ctn-hs).ti,ab.
12.	(hs?tni or hs-?tni or tni-hs or tnihs or ctnihs or ctni-hs or ctni-ultra or accutni or accu-tni).ti,ab.
13.	Myoglobin/
14.	(myoglobin* adj5 (analys* or analyze* or test* or investigat* or evaluat* or examin* or check* or assess* or measur* or diagnos* or identif* or verif* or assay or biological marker* or biomarker* or bio marker*)).ti,ab.
15.	Creatine Kinase/

16.	(creatinine kinase* adj5 (analys* or analyze* or test* or investigat* or evaluat* or examin* or check* or assess* or measur* or diagnos* or identif* or verif* or assay or biological marker* or biomarker* or bio marker*)).ti,ab.
17.	Creatine Kinase, MB Form/
18.	(ck mb* or ck 2 or (mb* adj3 (isoenzyme* or enzyme* or isoform*))).ti,ab.
19.	or/8-18
20.	4 and 19
21.	Study filters RCT [A.3.2] or SR [A.3.3] or DIAG [A.3.5]
22.	20 and 21

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	troponin/
6.	troponin c/ or troponin t/
7.	(sensitiv* or hs or early or initial or rapid or present* or ultra or high performance or ultrasensitive).ti,ab.
8.	(5 or 6) and 7
9.	((troponin* or tnt or ctn or tropt or trop t or tni or ctni or tropl or trop l) adj2 (sensitiv* or hs or early or initial or rapid or present* or ultra or high performance or ultrasensitive)).ti,ab.
10.	(troponin* adj5 (architect or elecsys or accutni or accu-tni or access or unicel)).ti,ab.
11.	(hs?tnt or hs-?tnt or tnt-hs or tnths or ctnths or ctnt-hs).ti,ab.
12.	(hs?tni or hs-?tni or tni-hs or tnihs or ctnihs or ctni-hs or ctni-ultra or accutni or accu-tni).ti,ab.
13.	myoglobin/
14.	(myoglobin* adj5 (analys* or analyze* or test* or investigat* or evaluat* or examin* or check* or assess* or measur* or diagnos* or identif* or verif* or assay or biological marker* or biomarker* or bio marker*)).ti,ab.
15.	creatine kinase/
16.	(creatine kinase* adj5 (analys* or analyze* or test* or investigat* or evaluat* or examin* or check* or assess* or measur* or diagnos* or identif* or verif* or assay or biological marker* or biomarker* or bio marker*)).ti,ab.
17.	creatine kinase MB/
18.	(ck mb* or ck 2 or (mb* adj3 (isoenzyme* or enzyme* or isoform*))).ti,ab.
19.	or/8-18
20.	4 and 19
21.	Study filters RCT [A.3.2] or SR [A.3.3] or DIAG [A.3.5]
22.	20 and 21

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [Troponin] explode all trees
#3.	MeSH descriptor: [Troponin I] this term only
#4.	MeSH descriptor: [Troponin T] this term only
#5.	(sensitiv* or hs or early or initial or rapid or present* or ultra or high performance or ultrasensitive):ti,ab,kw
#6.	(#2 or #3 or #4) and #5

#7.	((troponin* or tnt or ctn or tropt or trop t or tni or ctni or tropl or trop l) near/2 (sensitiv* or hs or early or initial or rapid or present* or ultra or high performance or ultrasensitive)):ti,ab,kw
#8.	(troponin* near/5 (architect or elecsys or accutni or accu-tni or access or unisel)):ti,ab,kw
#9.	(hs*tnt or hs-*tnt or tnt-hs or tnths or ctnths or ctn-hs):ti,ab,kw
#10.	(hs*tni or hs-*tni or tni-hs or tnihs or ctnihs or ctni-hs or ctni-ultra or accutni or accu-tni):ti,ab,kw
#11.	MeSH descriptor: [Myoglobin] this term only
#12.	(myoglobin* near/5 (analys* or analyze* or test* or investigat* or evaluat* or examin* or check* or assess* or measur* or diagnos* or identif* or verif* or assay or biological marker* or biomarker* or bio marker*)):ti,ab,kw
#13.	MeSH descriptor: [Creatine Kinase] this term only
#14.	(creatin kinase* near/5 (analys* or analyze* or test* or investigat* or evaluat* or examin* or check* or assess* or measur* or diagnos* or identif* or verif* or assay or biological marker* or biomarker* or bio marker*)):ti,ab,kw
#15.	MeSH descriptor: [Creatine Kinase, MB Form] this term only
#16.	(ck mb* or ck 2 or (mb* near/3 (isoenzyme* or enzyme* or isoform*)):ti,ab,kw
#17.	{or #6-#16}
#18.	#1 and #17

A.5 Health economics search terms

A.5.1 Health economic (HE) reviews

Economic searches were conducted in Medline, Embase and CRD databases.

Medline & Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	Study filter HE (A.3.4)
6.	4 and 5
	Date parameters: March 2009 – 10 May 2016

CRD search terms

#1.	Standard population [A.2.1]
	Date parameters: Inception to 10 May 2015