

Joint replacement (primary): hip, knee and shoulder

NICE guideline: search strategies

NICE guideline

Search strategies

July 2019

Draft for Consultation

*This guideline was developed by the
National Guideline Centre*

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Joint replacement search strategy 1

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014. {NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.1 Information needs prior to joint replacement surgery

A.1.1 Clinical search literature search strategy

Searches for patient views were run in Medline (OVID), Embase (OVID), CINAHL, Current Nursing and Allied Health Literature (EBSCO) and PsycINFO (ProQuest). Search filters were applied to the search where appropriate.

Table 1: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Qualitative studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Qualitative studies
CINAHL, Current Nursing and Allied Health Literature (EBSCO)	Inception – 01 May 2019	Exclusions Qualitative studies
PsycINFO (ProQuest)	Inception – 01 May 2019	Exclusions Qualitative studies

Medline (Ovid) search terms

1.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
2.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
3.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
4.	or/1-3
5.	letter/
6.	editorial/
7.	news/
8.	exp historical article/
9.	Anecdotes as Topic/
10.	comment/
11.	case report/
12.	(letter or comment*).ti.
13.	or/5-12
14.	randomized controlled trial/ or random*.ti,ab.
15.	13 not 14
16.	animals/ not humans/
17.	exp Animals, Laboratory/
18.	exp Animal Experimentation/

19.	exp Models, Animal/
20.	exp Rodentia/
21.	(rat or rats or mouse or mice).ti.
22.	or/15-21
23.	4 not 22
24.	limit 23 to English language
25.	Patients/ or Inpatients/ or Outpatients/
26.	Caregivers/ or exp Family/ or exp Parents/ or exp Legal-Guardians/
27.	(patient* or carer* or caregiver* or famil*).ti,ab.
28.	or/25-27
29.	Patient Education Handout/ or exp Information-Services/ or Publications/ or Books/ or Pamphlets/ or Counseling/ or Directive-Counseling/
30.	28 and 29
31.	(patient* adj3 (education or educate or educating or literature or leaflet* or booklet* or pamphlet* or information*)).ti,ab.
32.	Patient Education as Topic/
33.	Consumer Health Information/
34.	(information* adj3 (patient* or need* or requirement* or support* or seek* or access* or disseminat* or barrier*)).ti,ab.
35.	(discharge* adj3 (information* or advice)).ti,ab.
36.	or/31-35
37.	exp Consumer Behavior/ or Personal-Satisfaction/ or exp Patient-Acceptance-Of-Health-Care/
38.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform*)).ti,ab.
39.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (knowledge or awareness or misconception* or understanding or misunderstanding)).ti,ab.
40.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (experience or experiences or opinion* or concern* or belief* or feeling* or idea* or satisfaction or anxiet* or fear* or acceptance or denial or stigma* or label* or behaviour* or behavior*)).ti,ab.
41.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (need* or requirement* or support* or communication* or involve*)).ti,ab.
42.	or/37-41
43.	30 or 36 or 42
44.	24 and 43
45.	Qualitative research/ or Narration/ or exp Interviews as Topic/ or exp "Surveys and Questionnaires"/ or Health care surveys/
46.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
47.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).ti,ab.
48.	or/45-47
49.	44 and 48

Embase (Ovid) search terms

1.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
2.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
3.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
4.	or/1-3
5.	letter.pt. or letter/
6.	note.pt.
7.	editorial.pt.
8.	case report/ or case study/
9.	(letter or comment*).ti.
10.	or/5-9
11.	randomized controlled trial/ or random*.ti,ab.
12.	10 not 11
13.	animal/ not human/
14.	nonhuman/
15.	exp Animal Experiment/
16.	exp Experimental Animal/
17.	animal model/
18.	exp Rodent/
19.	(rat or rats or mouse or mice).ti.
20.	or/12-19
21.	4 not 20
22.	limit 21 to English language
23.	*patient/ or *hospital patient/ or *outpatient/
24.	*caregiver/ or *family/ or adult child/ or family relation/ or grandparent/ or military family/ or nuclear family/ or single-parent family/ or *parent/ or father/ or mother/ or single parent/ or legal guardian/
25.	(patient* or carer* or caregiver* or famil*).ti,ab.
26.	or/23-25
27.	information service/ or documentation/ or publication/ or book/ or counseling/ or directive counseling/
28.	26 and 27
29.	(patient* adj3 (education or educate or educating or literature or leaflet* or booklet* or pamphlet* or information*)).ti,ab.
30.	patient education/
31.	consumer health information/
32.	(information* adj3 (patient* or need* or requirement* or support* or seek* or access* or disseminat* or barrier*)).ti,ab.
33.	(discharge* adj3 (information* or advice)).ti,ab.
34.	or/29-33
35.	*consumer attitude/ or *satisfaction/ or patient attitude/ or patient compliance/ or patient dropout/ or patient participation/ or patient preference/ or patient satisfaction/
36.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform*)).ti,ab.

37.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (knowledge or awareness or misconception* or understanding or misunderstanding)).ti,ab.
38.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (experience or experiences or opinion* or concern* or belief* or feeling* or idea* or satisfaction or anxiet* or fear* or acceptance or denial or stigma* or label* or behaviour* or behavior*)).ti,ab.
39.	((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) adj3 (need* or requirement* or support* or communication* or involve*)).ti,ab.
40.	or/35-39
41.	28 or 34 or 40
42.	22 and 41
43.	health survey/ or exp questionnaire/ or exp interview/ or qualitative research/ or narrative/
44.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
45.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).ti,ab.
46.	or/43-45
47.	42 and 46

CINAHL (EBSCO) search terms

S1.	(MH "Arthroplasty") OR (MH "Arthroplasty, Replacement") OR (MH "Arthroplasty, Replacement, Hip") OR (MH "Arthroplasty, Replacement, Knee") OR (MH "Arthroplasty, Replacement, Shoulder") OR (MH "Hemiarthroplasty")
S2.	(MH "Joint Prosthesis") OR (MH "Shoulder Prosthesis")
S3.	TI ((joint* or knee* or shoulder* or hip*) n5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*))
S4.	AB ((joint* or knee* or shoulder* or hip*) n5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*))
S5.	S1 OR S2 OR S3 OR S4
S6.	PT anecdote or PT audiovisual or PT bibliography or PT biography or PT book or PT book review or PT brief item or PT cartoon or PT commentary or PT computer program or PT editorial or PT games or PT glossary or PT historical material or PT interview or PT letter or PT listservs or PT masters thesis or PT obituary or PT pamphlet or PT pamphlet chapter or PT pictorial or PT poetry or PT proceedings or PT "questions and answers" or PT response or PT software or PT teaching materials or PT website
S7.	S5 NOT S6
S8.	(MH "Patients") OR (MH "Inpatients") OR (MH "Outpatients")
S9.	(MH "Caregivers") OR (MH "Family+") OR (MH "Parents+") OR (MH "Guardianship, Legal+")
S10.	TI (patient* or carer* or caregiver* or famil*)
S11.	AB (patient* or carer* or caregiver* or famil*)
S12.	S8 OR S9 OR S10 OR S11
S13.	(MH "Information Services+") OR (MH "Books") OR (MH "Pamphlets") OR (MH "Counseling")
S14.	S12 AND S13

S15.	TI (patient* n3 (education or educate or educating or literature or leaflet* or booklet* or pamphlet* or information*))
S16.	AB (patient* n3 (education or educate or educating or literature or leaflet* or booklet* or pamphlet* or information*))
S17.	(MH "Patient Education")
S18.	(MH "Consumer Health Information")
S19.	TI (information* n3 (patient* or need* or requirement* or support* or seek* or access* or disseminat* or barrier*))
S20.	AB (information* n3 (patient* or need* or requirement* or support* or seek* or access* or disseminat* or barrier*))
S21.	TI (discharge* n3 (information* or advice))
S22.	AB (discharge* n3 (information* or advice))
S23.	S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22
S24.	(MH "Consumer Attitudes") OR (MH "Personal Satisfaction") OR (MH "Patient Attitudes") OR (MH "Patient Compliance") OR (MH "Patient Dropouts") OR (MH "Patient Preference") OR (MH "Patient Satisfaction")
S25.	TI ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform*))
S26.	AB ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform*))
S27.	TI ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (knowledge or awareness or misconception* or understanding or misunderstanding))
S28.	AB ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (knowledge or awareness or misconception* or understanding or misunderstanding))
S29.	TI ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (experience or experiences or opinion* or concern* or belief* or feeling* or idea* or satisfaction or anxiet* or fear* or acceptance or denial or stigma* or label* or behaviour* or behavior*))
S30.	AB ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (experience or experiences or opinion* or concern* or belief* or feeling* or idea* or satisfaction or anxiet* or fear* or acceptance or denial or stigma* or label* or behaviour* or behavior*))
S31.	TI ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (need* or requirement* or support* or communication* or involve*))
S32.	AB ((patient* or user* or carer* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or significant other* or partner*) n3 (need* or requirement* or support* or communication* or involve*))
S33.	S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32
S34.	S14 OR S23 OR S33
S35.	S7 AND S34
S36.	(MH "Qualitative Studies+")
S37.	(MH "Qualitative Validity+")
S38.	(MH "Interviews+") OR (MH "Focus Groups") OR (MH "Surveys") OR (MH "Questionnaires+")
S39.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*)
S40.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or

	meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*)
S41.	S36 OR S37 OR S38 OR S39 OR S40
S42.	S35 AND S41

PsycINFO (ProQuest) search terms

1.	<p>((joint* OR knee* OR shoulder* OR hip*) NEAR/5 (surger* OR replace* OR prosthe* OR endoprosthe* OR implant* OR artificial OR arthroplast* OR hemiarthroplast*)) NOT (su.exact.explode("rodents") OR su.exact.explode("mice") OR (su.exact("animals") NOT (su.exact("human males") OR su.exact("human females")))) OR ti(rat OR rats OR mouse OR mice)) AND ((MAINSUBJECT.EXACT("Patients") OR MAINSUBJECT.EXACT("Outpatients")) OR (MAINSUBJECT.EXACT.EXPLODE("Parents") OR MAINSUBJECT.EXACT("Caregivers") OR MAINSUBJECT.EXACT.EXPLODE("Family") OR MAINSUBJECT.EXACT("Guardianship")) OR (patient* OR carer* OR caregiver* OR famil*) AND (MAINSUBJECT.EXACT("Books") OR MAINSUBJECT.EXACT.EXPLODE("Information Services") OR MAINSUBJECT.EXACT("Counseling")) OR ((patient* NEAR3 (education OR educate OR educating OR literature OR leaflet* OR booklet* OR pamphlet* OR information*)) OR MAINSUBJECT.EXACT("Patient education") OR (information* NEAR3 (patient* OR need* OR requirement* OR support* OR seek* OR access* OR disseminat* OR barrier*)) OR (discharge* NEAR3 (information* OR advice)))) OR (MAINSUBJECT.EXACT("Satisfaction") OR MAINSUBJECT.EXACT.EXPLODE("Consumer Attitudes") OR MAINSUBJECT.EXACT("Client Attitudes") OR MAINSUBJECT.EXACT("Treatment Dropouts") OR MAINSUBJECT.EXACT("Client Satisfaction") OR MAINSUBJECT.EXACT("Client Participation") OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (attitud* OR priorit* OR perception* OR preferen* OR expectation* OR choice* OR perspective* OR view* OR satisfaction* OR inform*)) OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (knowledge OR awareness OR misconception* OR understanding OR misunderstanding)) OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (experience OR experiences OR opinion* OR concern* OR belief* OR feeling* OR idea* OR satisfaction OR anxiet* OR fear* OR acceptance OR denial OR stigma* OR label* OR behaviour* OR behavior*)) OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (need* OR requirement* OR support* OR communication* OR involve*)) AND ((joint* OR knee* OR shoulder* OR hip*) NEAR/5 (surger* OR replace* OR prosthe* OR endoprosthe* OR implant* OR artificial OR arthroplast* OR hemiarthroplast*)) NOT (su.exact.explode("rodents") OR su.exact.explode("mice") OR (su.exact("animals") NOT (su.exact("human males") OR su.exact("human females")))) OR ti(rat OR rats OR mouse OR mice)) AND ((MAINSUBJECT.EXACT("Patients") OR MAINSUBJECT.EXACT("Outpatients")) OR (MAINSUBJECT.EXACT.EXPLODE("Parents") OR MAINSUBJECT.EXACT("Caregivers") OR MAINSUBJECT.EXACT.EXPLODE("Family") OR MAINSUBJECT.EXACT("Guardianship")) OR (patient* OR carer* OR caregiver* OR famil*) AND (MAINSUBJECT.EXACT("Books") OR MAINSUBJECT.EXACT.EXPLODE("Information Services") OR MAINSUBJECT.EXACT("Counseling")) AND ((patient* NEAR3 (education OR educate OR educating OR literature OR leaflet* OR booklet* OR pamphlet* OR information*)) OR MAINSUBJECT.EXACT("Patient education") OR (information* NEAR3 (patient* OR need* OR requirement* OR support* OR seek* OR access* OR disseminat* OR</p>
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barrier*)) OR (discharge* NEAR3 (information* OR advice)))) OR (MAINSUBJECT.EXACT("Satisfaction") OR MAINSUBJECT.EXACT.EXPLODE("Consumer Attitudes") OR MAINSUBJECT.EXACT("Client Attitudes") OR MAINSUBJECT.EXACT("Treatment Dropouts") OR MAINSUBJECT.EXACT("Client Satisfaction") OR MAINSUBJECT.EXACT("Client Participation") OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (attitud* OR priorit* OR perception* OR preferen* OR expectation* OR choice* OR perspective* OR view* OR satisfact* OR inform*)) OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (knowledge OR awareness OR misconception* OR understanding OR misunderstanding)) OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (experience OR experiences OR opinion* OR concern* OR belief* OR feeling* OR idea* OR satisfaction OR anxiet* OR fear* OR acceptance OR denial OR stigma* OR label* OR behaviour* OR behavior*)) OR ((patient* OR user* OR carer* OR famil* OR parent* OR father* OR mother* OR spouse* OR wife OR wives OR husband* OR significant other* OR partner*) NEAR3 (need* OR requirement* OR support* OR communication* OR involve*)) AND ((su.exact.explode("qualitative methods") OR su.exact("narratives") OR su.exact.explode("questionnaires") OR su.exact.explode("interviews") OR su.exact.explode("health care services") OR ti,ab(qualitative OR interview* OR focus group* OR theme* OR questionnaire* OR survey*) OR ti,ab(metasynthes* OR meta-synthes* OR metasummar* OR meta-summar* OR metastud* OR meta-stud* OR metathem* OR meta-them* OR ethno* OR emic OR etic OR phenomenolog* OR grounded theory OR constant compar* OR (thematic* NEAR/3 analys*) OR theoretical-sampl* OR purposive-sampl* OR hermeneutic* OR heidegger* OR husserl* OR colaizzi* OR van kaam* OR van manen* OR giorgi* OR glaser* OR strauss* OR ricoeur* OR spiegelberg* OR merleau*)) AND la.exact("English")

A.1.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in the NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA), with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 2: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

1.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
2.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/

3.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
4.	or/1-3
5.	letter/
6.	editorial/
7.	news/
8.	exp historical article/
9.	Anecdotes as Topic/
10.	comment/
11.	case report/
12.	(letter or comment*).ti.
13.	or/5-12
14.	randomized controlled trial/ or random*.ti,ab.
15.	13 not 14
16.	animals/ not humans/
17.	exp Animals, Laboratory/
18.	exp Animal Experimentation/
19.	exp Models, Animal/
20.	exp Rodentia/
21.	(rat or rats or mouse or mice).ti.
22.	or/15-21
23.	4 not 22
24.	limit 23 to English language
25.	Economics/
26.	Value of life/
27.	exp "Costs and Cost Analysis"/
28.	exp Economics, Hospital/
29.	exp Economics, Medical/
30.	Economics, Nursing/
31.	Economics, Pharmaceutical/
32.	exp "Fees and Charges"/
33.	exp Budgets/
34.	budget*.ti,ab.
35.	cost*.ti.
36.	(economic* or pharmaco?economic*).ti.
37.	(price* or pricing*).ti,ab.
38.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
39.	(financ* or fee or fees).ti,ab.
40.	(value adj2 (money or monetary)).ti,ab.
41.	or/25-40
42.	24 and 41

Embase (Ovid) search terms

1.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
2.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
3.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endopros* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
4.	or/1-3
5.	letter.pt. or letter/
6.	note.pt.
7.	editorial.pt.
8.	case report/ or case study/
9.	(letter or comment*).ti.
10.	or/5-9
11.	randomized controlled trial/ or random*.ti,ab.
12.	10 not 11
13.	animal/ not human/
14.	nonhuman/
15.	exp Animal Experiment/
16.	exp Experimental Animal/
17.	animal model/
18.	exp Rodent/
19.	(rat or rats or mouse or mice).ti.
20.	or/12-19
21.	4 not 20
22.	limit 21 to English language
23.	health economics/
24.	exp economic evaluation/
25.	exp health care cost/
26.	exp fee/
27.	budget/
28.	funding/
29.	budget*.ti,ab.
30.	cost*.ti.
31.	(economic* or pharmaco?economic*).ti.
32.	(price* or pricing*).ti,ab.
33.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
34.	(financ* or fee or fees).ti,ab.
35.	(value adj2 (money or monetary)).ti,ab.
36.	or/23-35
37.	22 and 36

NHS EED and HTA (CRD) search terms

#1.	MeSH DESCRIPTOR arthroplasty
#2.	MeSH DESCRIPTOR arthroplasty, replacement
#3.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#4.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#5.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#6.	MeSH DESCRIPTOR hemiarthroplasty
#7.	MeSH DESCRIPTOR joint prosthesis
#8.	MeSH DESCRIPTOR hip prosthesis
#9.	MeSH DESCRIPTOR knee prosthesis
#10.	MeSH DESCRIPTOR shoulder prosthesis
#11.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*))
#12.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#13.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

Joint replacement search strategy 2

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.2 Decision aids during joint replacement

A.2.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the search where appropriate.

Searches for patient views were run in Medline (OVID), Embase (OVID), CINAHL, Current Nursing and Allied Health Literature (EBSCO) and PsycINFO (ProQuest). Search filters were applied to the searches where appropriate.

Table 3: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies Qualitative studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies Qualitative studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12 DARE, and NHSEED to 2015 Issue 2 of 4 HTA to 2016 Issue 4 of 4	None
CINAHL, Current Nursing and Allied Health Literature (EBSCO)	Inception – 01 May 2019	Exclusions
PsycINFO (ProQuest)	Inception – 01 May 2019	Exclusions

Medline (Ovid) search terms

50.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
51.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
52.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.

53.	or/1-3
54.	letter/
55.	editorial/
56.	news/
57.	exp historical article/
58.	Anecdotes as Topic/
59.	comment/
60.	case report/
61.	(letter or comment*).ti.
62.	or/5-12
63.	randomized controlled trial/ or random*.ti,ab.
64.	13 not 14
65.	animals/ not humans/
66.	exp Animals, Laboratory/
67.	exp Animal Experimentation/
68.	exp Models, Animal/
69.	exp Rodentia/
70.	(rat or rats or mouse or mice).ti.
71.	or/15-21
72.	4 not 22
73.	limit 23 to English language
74.	Decision Support Techniques/
75.	Decision Support Systems, Clinical/
76.	Decision Making/ or Choice behavior/ or informed consent/
77.	Patient participation/
78.	Physician-patient relations/ or Professional-Patient Relations/
79.	(decision making or ((choice* or option*) adj (behavior* or behaviour*))).ti,ab.
80.	((decision* or decid*) adj4 (option* or support* or aid* or tool* or instrument* or technolog* or technique* or system* or program* or algorithm* or process* or method* or intervention* or material*)).ti,ab.
81.	((share* or sharing or making or made or agree* or participat* or support* or collaborat* or joint) adj2 (decision* or decid* or make*)).ti,ab.
82.	((decision or decid*) adj3 (board* or guide* or counseling or counselling)).ti,ab.
83.	((risk communication or risk assessment or risk information) adj4 (tool* or method*)).ti,ab.
84.	(informed adj (choice* or decision*)).ti,ab.
85.	((communicat* or discuss* or speak* or talk* or converse* or conversat*) adj3 (treatment* or procedure* or timing* or implant*)).ti,ab.
86.	(patient-cent* adj3 (decision* or tool* or choice*)).ti,ab.
87.	or/25-37
88.	24 and 38
89.	randomized controlled trial.pt.
90.	controlled clinical trial.pt.
91.	randomi#ed.ti,ab.
92.	placebo.ab.
93.	randomly.ti,ab.
94.	Clinical Trials as topic.sh.
95.	trial.ti.

96.	or/40-46
97.	Meta-Analysis/
98.	exp Meta-Analysis as Topic/
99.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
100.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
101.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
102.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
103.	(search* adj4 literature).ab.
104.	(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.
105.	cochrane.jw.
106.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
107.	or/48-57
108.	Epidemiologic studies/
109.	Observational study/
110.	exp Cohort studies/
111.	(cohort adj (study or studies or analys* or data)).ti,ab.
112.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
113.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
114.	Controlled Before-After Studies/
115.	Historically Controlled Study/
116.	Interrupted Time Series Analysis/
117.	(before adj2 after adj2 (study or studies or data)).ti,ab.
118.	or/59-68
119.	exp case control study/
120.	case control*.ti,ab.
121.	or/70-71
122.	69 or 72
123.	Cross-sectional studies/
124.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
125.	or/74-75
126.	69 or 76
127.	69 or 72 or 76
128.	health survey/ or exp questionnaire/ or exp interview/ or qualitative research/ or narrative/
129.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
130.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).ti,ab.
131.	or/79-81
132.	39 and (47 or 58 or 78 or 82)

Embase (Ovid) search terms

48.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
49.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
50.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
51.	or/1-3
52.	letter.pt. or letter/
53.	note.pt.
54.	editorial.pt.
55.	case report/ or case study/
56.	(letter or comment*).ti.
57.	or/5-9
58.	randomized controlled trial/ or random*.ti,ab.
59.	10 not 11
60.	animal/ not human/
61.	nonhuman/
62.	exp Animal Experiment/
63.	exp Experimental Animal/
64.	animal model/
65.	exp Rodent/
66.	(rat or rats or mouse or mice).ti.
67.	or/12-19
68.	4 not 20
69.	limit 21 to English language
70.	decision support system/
71.	*decision making/ or informed consent/
72.	patient participation/
73.	*doctor patient relation/ or professional-patient relationship/
74.	(decision making or ((choice* or option*) adj (behavior* or behaviour*))).ti,ab.
75.	((decision* or decid*) adj4 (option* or support* or aid* or tool* or instrument* or technolog* or technique* or system* or program* or algorithm* or process* or method* or intervention* or material*)).ti,ab.
76.	((share* or sharing or making or made or agree* or participat* or support* or collaborat* or joint) adj2 (decision* or decid* or make*)).ti,ab.
77.	((decision or decid*) adj3 (board* or guide* or counseling or counselling)).ti,ab.
78.	((risk communication or risk assessment or risk information) adj4 (tool* or method*)).ti,ab.
79.	(informed adj (choice* or decision*)).ti,ab.
80.	((communicat* or discuss* or speak* or talk* or converse* or conversat*) adj3 (treatment* or procedure* or timing* or implant*)).ti,ab.
81.	(patient-cent* adj3 (decision* or tool* or choice*)).ti,ab.
82.	or/23-34
83.	22 and 35
84.	random*.ti,ab.
85.	factorial*.ti,ab.
86.	(crossover* or cross over*).ti,ab.
87.	((doubl* or singl*) adj blind*).ti,ab.
88.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
89.	crossover procedure/

90.	single blind procedure/
91.	randomized controlled trial/
92.	double blind procedure/
93.	or/37-45
94.	systematic review/
95.	meta-analysis/
96.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
97.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
98.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
99.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
100.	(search* adj4 literature).ab.
101.	(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.
102.	cochrane.jw.
103.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
104.	or/47-56
105.	Clinical study/
106.	Observational study/
107.	family study/
108.	longitudinal study/
109.	retrospective study/
110.	prospective study/
111.	cohort analysis/
112.	follow-up/
113.	cohort*.ti,ab.
114.	65 and 66
115.	(cohort adj (study or studies or analys* or data)).ti,ab.
116.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
117.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
118.	(before adj2 after adj2 (study or studies or data)).ti,ab.
119.	or/58-64,67-71
120.	exp case control study/
121.	case control*.ti,ab.
122.	or/73-74
123.	72 or 75
124.	cross-sectional study/
125.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
126.	or/77-78
127.	72 or 79
128.	72 or 75 or 79
129.	health survey/ or exp questionnaire/ or exp interview/ or qualitative research/ or narrative/
130.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
131.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or

	grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).ti,ab.
132.	or/82-84
133.	36 and (46 or 57 or 81 or 85)

Cochrane Library (Wiley) search terms

#1.	MeSH descriptor: [Arthroplasty] this term only
#2.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#3.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#4.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#5.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#6.	MeSH descriptor: [Hemiarthroplasty] this term only
#7.	(or #1-#6)
#8.	MeSH descriptor: [Joint Prosthesis] this term only
#9.	MeSH descriptor: [Hip Prosthesis] this term only
#10.	MeSH descriptor: [Knee Prosthesis] this term only
#11.	MeSH descriptor: [Shoulder Prosthesis] this term only
#12.	(or #8-#11)
#13.	((joint* or knee* or shoulder* or hip*) near/5 (surger* or replace* or prosthe* or endoprothe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#14.	(or #7, #12-#13)
#15.	MeSH descriptor: [Decision Support Techniques] this term only
#16.	MeSH descriptor: [Decision Support Systems, Clinical] this term only
#17.	MeSH descriptor: [Decision Making] this term only
#18.	MeSH descriptor: [Choice Behavior] this term only
#19.	MeSH descriptor: [Informed Consent] this term only
#20.	MeSH descriptor: [Patient Participation] this term only
#21.	MeSH descriptor: [Physician-Patient Relations] this term only
#22.	MeSH descriptor: [Professional-Patient Relations] this term only
#23.	(decision making or ((choice* or option*) near/1 (behavior* or behaviour*)):ti,ab
#24.	((decision* or decid*) near/4 (option* or support* or aid* or tool* or instrument* or technolog* or technique* or system* or program* or algorithm* or process* or method* or intervention* or material*)):ti,ab
#25.	((share* or sharing or making or made or agree* or participat* or support* or collaborat* or joint) near/2 (decision* or decid* or make*)):ti,ab
#26.	((decision or decid*) near/3 (board* or guide* or counseling or counselling)):ti,ab
#27.	((risk communication or risk assessment or risk information) near/4 (tool* or method*)):ti,ab
#28.	(informed near/1 (choice* or decision*)):ti,ab
#29.	((communicat* or discuss* or speak* or talk* or converse* or conversat*) near/3 (treatment* or procedure* or timing* or implant*)):ti,ab
#30.	(patient-cent* near/3 (decision* or tool* or choice*)):ti,ab
#31.	(OR #15-#30)
#32.	#14 AND #31

CINAHL (EBSCO) search terms

S43.	(MH "Arthroplasty") OR (MH "Arthroplasty, Replacement") OR (MH "Arthroplasty,
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	Replacement, Hip") OR (MH "Arthroplasty, Replacement, Knee") OR (MH "Arthroplasty, Replacement, Shoulder") OR (MH "Hemiarthroplasty")
S44.	(MH "Joint Prosthesis") OR (MH "Shoulder Prosthesis")
S45.	TI ((joint* or knee* or shoulder* or hip*) n5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*))
S46.	AB ((joint* or knee* or shoulder* or hip*) n5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*))
S47.	S1 OR S2 OR S3 OR S4
S48.	PT anecdote or PT audiovisual or PT bibliography or PT biography or PT book or PT book review or PT brief item or PT cartoon or PT commentary or PT computer program or PT editorial or PT games or PT glossary or PT historical material or PT interview or PT letter or PT listservs or PT masters thesis or PT obituary or PT pamphlet or PT pamphlet chapter or PT pictorial or PT poetry or PT proceedings or PT "questions and answers" or PT response or PT software or PT teaching materials or PT website
S49.	S5 NOT S6
S50.	(MH "Decision Support Techniques") OR (MH "Decision Support Systems, Clinical")
S51.	(MH "Decision Making") OR (MH "Consent+")
S52.	(MH "Consumer Participation")
S53.	(MH "Physician-Patient Relations") OR (MH "Professional-Patient Relations")
S54.	TI (decision making or ((choice* or option*) n1 (behavior* or behaviour**)))
S55.	AB (decision making or ((choice* or option*) n1 (behavior* or behaviour**)))
S56.	TI ((decision* or decid*) n4 (option* or support* or aid* or tool* or instrument* or technolog* or technique* or system* or program* or algorithm* or process* or method* or intervention* or material*))
S57.	AB ((decision* or decid*) n4 (option* or support* or aid* or tool* or instrument* or technolog* or technique* or system* or program* or algorithm* or process* or method* or intervention* or material*))
S58.	TI ((share* or sharing or making or made or agree* or participat* or support* or collaborat* or joint) n2 (decision* or decid* or make*))
S59.	AB ((share* or sharing or making or made or agree* or participat* or support* or collaborat* or joint) n2 (decision* or decid* or make*))
S60.	TI ((decision or decid*) n3 (board* or guide* or counseling or counselling))
S61.	AB ((decision or decid*) n3 (board* or guide* or counseling or counselling))
S62.	TI ((risk communication or risk assessment or risk information) n4 (tool* or method*))
S63.	AB ((risk communication or risk assessment or risk information) n4 (tool* or method*))
S64.	TI (informed n1 (choice* or decision*))
S65.	AB (informed n1 (choice* or decision*))
S66.	TI ((communicat* or discuss* or speak* or talk* or converse* or conversat*) n3 (treatment* or procedure* or timing* or implant*))
S67.	AB ((communicat* or discuss* or speak* or talk* or converse* or conversat*) n3 (treatment* or procedure* or timing* or implant*))
S68.	TI (patient-cent* n3 (decision* or tool* or choice*))
S69.	AB (patient-cent* n3 (decision* or tool* or choice*))
S70.	S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S27
S71.	S7 AND S28

PsycINFO (ProQuest) search terms

2.	((ti,ab((joint* OR knee* OR shoulder* OR hip*) NEAR/5 (surger* OR replace* OR prosth* OR endoprosth* OR implant* OR artificial OR arthroplast* OR hemiarthroplast*)) NOT (su.exact.explode("rodents") OR su.exact.explode("mice") OR (su.exact("animals") NOT (su.exact("human males") OR su.exact("human females"))))
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	OR ti(rat OR rats OR mouse OR mice))) AND ((MAINSUBJECT.EXACT("Decision Support Systems") OR MAINSUBJECT.EXACT("Choice Behavior") OR MAINSUBJECT.EXACT("Informed Consent") OR MAINSUBJECT.EXACT("Decision Making") OR MAINSUBJECT.EXACT("Client Participation")) OR ti,ab((decision* OR decid*) NEAR/4 (option* OR support* OR aid* OR tool* OR instrument* OR technolog* OR technique* OR system* OR program* OR algorithm* OR process* OR method* OR intervention* OR material*)) OR ti,ab((share* OR sharing OR making OR made OR agree* OR participat* OR support* OR collaborat* OR joint) NEAR/2 (decision* OR decid* OR make*)) OR ti,ab((decision OR decid*) NEAR/3 (board* OR guide* OR counseling OR counselling)) OR (informed NEAR/1 (choice* OR decision*))) AND la.exact("English")
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A.2.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 4: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

43.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
44.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
45.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or proste* or endoproste* or implant* or artificial or arthroplast* or hemiarthroplast*).ti,ab.
46.	or/1-3
47.	letter/
48.	editorial/
49.	news/
50.	exp historical article/
51.	Anecdotes as Topic/
52.	comment/
53.	case report/
54.	(letter or comment*).ti.
55.	or/5-12
56.	randomized controlled trial/ or random*.ti,ab.
57.	13 not 14

58.	animals/ not humans/
59.	exp Animals, Laboratory/
60.	exp Animal Experimentation/
61.	exp Models, Animal/
62.	exp Rodentia/
63.	(rat or rats or mouse or mice).ti.
64.	or/15-21
65.	4 not 22
66.	limit 23 to English language
67.	Economics/
68.	Value of life/
69.	exp "Costs and Cost Analysis"/
70.	exp Economics, Hospital/
71.	exp Economics, Medical/
72.	Economics, Nursing/
73.	Economics, Pharmaceutical/
74.	exp "Fees and Charges"/
75.	exp Budgets/
76.	budget*.ti,ab.
77.	cost*.ti.
78.	(economic* or pharmaco?economic*).ti.
79.	(price* or pricing*).ti,ab.
80.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
81.	(financ* or fee or fees).ti,ab.
82.	(value adj2 (money or monetary)).ti,ab.
83.	or/25-40
84.	24 and 41

Embase (Ovid) search terms

38.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
39.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
40.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
41.	or/1-3
42.	letter.pt. or letter/
43.	note.pt.
44.	editorial.pt.
45.	case report/ or case study/
46.	(letter or comment*).ti.
47.	or/5-9
48.	randomized controlled trial/ or random*.ti,ab.
49.	10 not 11
50.	animal/ not human/
51.	nonhuman/
52.	exp Animal Experiment/

53.	exp Experimental Animal/
54.	animal model/
55.	exp Rodent/
56.	(rat or rats or mouse or mice).ti.
57.	or/12-19
58.	4 not 20
59.	limit 21 to English language
60.	health economics/
61.	exp economic evaluation/
62.	exp health care cost/
63.	exp fee/
64.	budget/
65.	funding/
66.	budget*.ti,ab.
67.	cost*.ti.
68.	(economic* or pharmaco?economic*).ti.
69.	(price* or pricing*).ti,ab.
70.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
71.	(financ* or fee or fees).ti,ab.
72.	(value adj2 (money or monetary)).ti,ab.
73.	or/23-35
74.	22 and 36

NHS EED and HTA (CRD) search terms

#14.	MeSH DESCRIPTOR arthroplasty
#15.	MeSH DESCRIPTOR arthroplasty, replacement
#16.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#17.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#18.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#19.	MeSH DESCRIPTOR hemiarthroplasty
#20.	MeSH DESCRIPTOR joint prosthesis
#21.	MeSH DESCRIPTOR hip prosthesis
#22.	MeSH DESCRIPTOR knee prosthesis
#23.	MeSH DESCRIPTOR shoulder prosthesis
#24.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoproshe* or implant* or artificial or arthroplast* or hemiarthroplast*))
#25.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#26.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

Joint replacement search strategy 3

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014. {NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.3 Properative rehabilitation

A.4 Inpatient hip and knee postoperative rehabilitation

A.5 Inpatient shoulder postoperative rehabilitation

A.6 Postoperative outpatient hip and knee rehabilitation

A.7 Postoperative outpatient shoulder rehabilitation

A.7.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 5: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12 DARE, and NHSEED to 2015 Issue 2 of 4 HTA to 2016 Issue 4 of 4	None

Medline (Ovid) search terms

133.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
134.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
135.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
136.	or/1-3

137.	letter/
138.	editorial/
139.	news/
140.	exp historical article/
141.	Anecdotes as Topic/
142.	comment/
143.	case report/
144.	(letter or comment*).ti.
145.	or/5-12
146.	randomized controlled trial/ or random*.ti,ab.
147.	13 not 14
148.	animals/ not humans/
149.	exp Animals, Laboratory/
150.	exp Animal Experimentation/
151.	exp Models, Animal/
152.	exp Rodentia/
153.	(rat or rats or mouse or mice).ti.
154.	or/15-21
155.	4 not 22
156.	limit 23 to English language
157.	exp Rehabilitation/
158.	Rehabilitation Nursing/
159.	rehab*.ti,ab.
160.	(prehabilitat* or pre habilitat*).ti,ab.
161.	Early Ambulation/
162.	(early adj3 (ambulation or mobili*)).ti,ab.
163.	Physical Therapy Modalities/
164.	exp Exercise Therapy/ or Physical Conditioning, Human/ or Occupational Therapy/ or Recreation Therapy/ or Rehabilitation, Vocational/
165.	Motion Therapy, Continuous Passive/ or Muscle Stretching Exercises/ or Manipulation, Orthopedic/ or Resistance Training/
166.	((physical* or exercise* or motion or movement or occupational or recreation* or vocational) adj3 (therap* or condition*)).ti,ab.
167.	(manipulation or MUA).ti,ab.
168.	((standardi?ed or SE or continuous passive motion or CPM or slider board or SB or range of motion or ROM or resistance or weight bearing or equilibrium or flexibility or stretch*) adj2 (therap* or exercise*)).ti,ab.
169.	physiotherap*.ti,ab.
170.	Hydrotherapy/
171.	(hydrotherap* or aquatic physiotherap*).ti,ab.
172.	Transcutaneous Electric Nerve Stimulation/
173.	(electric* nerve stimulation or TENS).ti,ab.
174.	Patient Education as Topic/
175.	(patient* adj3 (education or information or advice)).ti,ab.
176.	or/25-43
177.	24 and 44

178.	randomized controlled trial.pt.
179.	controlled clinical trial.pt.
180.	randomi#ed.ti,ab.
181.	placebo.ab.
182.	randomly.ti,ab.
183.	Clinical Trials as topic.sh.
184.	trial.ti.
185.	or/46-52
186.	Meta-Analysis/
187.	exp Meta-Analysis as Topic/
188.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
189.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
190.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
191.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
192.	(search* adj4 literature).ab.
193.	(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.
194.	cochrane.jw.
195.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
196.	or/54-63
197.	Epidemiologic studies/
198.	Observational study/
199.	exp Cohort studies/
200.	(cohort adj (study or studies or analys* or data)).ti,ab.
201.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
202.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
203.	Controlled Before-After Studies/
204.	Historically Controlled Study/
205.	Interrupted Time Series Analysis/
206.	(before adj2 after adj2 (study or studies or data)).ti,ab.
207.	or/65-74
208.	exp case control study/
209.	case control*.ti,ab.
210.	or/76-77
211.	75 or 78
212.	Cross-sectional studies/
213.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
214.	or/80-81
215.	75 or 82
216.	75 or 78 or 82
217.	45 and (53 or 64 or 84)

Embase (Ovid) search terms

134.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
135.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
136.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
137.	or/1-3
138.	letter.pt. or letter/
139.	note.pt.
140.	editorial.pt.
141.	case report/ or case study/
142.	(letter or comment*).ti.
143.	or/5-9
144.	randomized controlled trial/ or random*.ti,ab.
145.	10 not 11
146.	animal/ not human/
147.	nonhuman/
148.	exp Animal Experiment/
149.	exp Experimental Animal/
150.	animal model/
151.	exp Rodent/
152.	(rat or rats or mouse or mice).ti.
153.	or/12-19
154.	4 not 20
155.	limit 21 to English language
156.	exp rehabilitation/
157.	rehabilitation nursing/
158.	rehab*.ti,ab.
159.	(prehabilitat* or pre habilitat*).ti,ab.
160.	*mobilization/
161.	(early adj3 (ambulation or mobili*)).ti,ab.
162.	*physiotherapy/ or *kinesiotherapy/ or *exercise/ or *occupational therapy/ or *recreational therapy/ or *vocational rehabilitation/
163.	*movement therapy/ or *stretching exercise/ or *orthopedic manipulation/ or *resistance training/
164.	((physical* or exercise* or motion or movement or occupational or recreation* or vocational) adj3 (therap* or condition*)).ti,ab.
165.	(manipulation or MUA).ti,ab.
166.	((standardi?ed or SE or continuous passive motion or CPM or slider board or SB or range of motion or ROM or resistance or weight bearing or equilibrium or flexibility or stretch*) adj2 (therap* or exercise*)).ti,ab.
167.	physiotherap*.ti,ab.
168.	hydrotherapy/
169.	(hydrotherap* or aquatic physiotherap*).ti,ab.
170.	transcutaneous electrical nerve stimulation/
171.	(electric* nerve stimulation or TENS).ti,ab.
172.	*patient education/

173.	(patient* adj3 (education or information or advice)).ti,ab.
174.	or/23-40
175.	22 and 41
176.	random*.ti,ab.
177.	factorial*.ti,ab.
178.	(crossover* or cross over*).ti,ab.
179.	((doubl* or singl*) adj blind*).ti,ab.
180.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
181.	crossover procedure/
182.	single blind procedure/
183.	randomized controlled trial/
184.	double blind procedure/
185.	or/43-51
186.	systematic review/
187.	meta-analysis/
188.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
189.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
190.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
191.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
192.	(search* adj4 literature).ab.
193.	(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.
194.	cochrane.jw.
195.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
196.	or/53-62
197.	Clinical study/
198.	Observational study/
199.	family study/
200.	longitudinal study/
201.	retrospective study/
202.	prospective study/
203.	cohort analysis/
204.	follow-up/
205.	cohort*.ti,ab.
206.	71 and 72
207.	(cohort adj (study or studies or analys* or data)).ti,ab.
208.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
209.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
210.	(before adj2 after adj2 (study or studies or data)).ti,ab.
211.	or/64-70,73-77
212.	exp case control study/
213.	case control*.ti,ab.
214.	or/79-80

215.	78 or 81
216.	cross-sectional study/
217.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
218.	or/83-84
219.	78 or 85
220.	78 or 81 or 85
221.	42 and (52 or 63 or 87)

Cochrane Library (Wiley) search terms

#33.	MeSH descriptor: [Arthroplasty] this term only
#34.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#35.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#36.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#37.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#38.	MeSH descriptor: [Hemiarthroplasty] this term only
#39.	(or #1-#6)
#40.	MeSH descriptor: [Joint Prosthesis] this term only
#41.	MeSH descriptor: [Hip Prosthesis] this term only
#42.	MeSH descriptor: [Knee Prosthesis] this term only
#43.	MeSH descriptor: [Shoulder Prosthesis] this term only
#44.	(or #8-#11)
#45.	((joint* or knee* or shoulder* or hip*) near/5 (surger* or replace* or prosthe* or endoprothe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#46.	(or #7, #12-#13)
#47.	MeSH descriptor: [Rehabilitation] explode all trees
#48.	MeSH descriptor: [Rehabilitation Nursing] explode all trees
#49.	rehab*:ti,ab
#50.	(prehabilitat* or pre habilitat*):ti,ab
#51.	MeSH descriptor: [Early Ambulation] this term only
#52.	(early near/3 (ambulation or mobili*)):ti,ab
#53.	MeSH descriptor: [Physical Therapy Modalities] this term only
#54.	MeSH descriptor: [Exercise Therapy] explode all trees
#55.	MeSH descriptor: [Physical Conditioning, Human] this term only
#56.	MeSH descriptor: [Occupational Therapy] this term only
#57.	MeSH descriptor: [Recreation Therapy] this term only
#58.	MeSH descriptor: [Rehabilitation, Vocational] this term only
#59.	MeSH descriptor: [Motion Therapy, Continuous Passive] this term only
#60.	MeSH descriptor: [Muscle Stretching Exercises] this term only
#61.	MeSH descriptor: [Manipulation, Orthopedic] this term only
#62.	MeSH descriptor: [Resistance Training] this term only
#63.	((physical* or exercise* or motion or movement or occupational or recreation* or vocational) near/3 (therap* or condition*)):ti,ab
#64.	(manipulation or MUA):ti,ab
#65.	((standardised or standardized or SE or continuous passive motion or CPM or slider board or SB or range of motion or ROM or resistance or weight bearing or equilibrium or flexibility or stretch*) near/2 (therap* or exercise*)):ti,ab
#66.	physiotherap*:ti,ab

#67.	MeSH descriptor: [Hydrotherapy] this term only
#68.	(hydrotherap* or aquatic physiotherap*):ti,ab
#69.	MeSH descriptor: [Transcutaneous Electric Nerve Stimulation] this term only
#70.	(electric* nerve stimulation or TENS):ti,ab
#71.	MeSH descriptor: [Patient Education as Topic] this term only
#72.	(patient* near/3 (education or information or advice)):ti,ab
#73.	(or #15-#40)
#74.	#14 and #41

A.7.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economic searches were run in Medline and Embase.

Table 6: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

85.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
86.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
87.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab.
88.	or/1-3
89.	letter/
90.	editorial/
91.	news/
92.	exp historical article/
93.	Anecdotes as Topic/
94.	comment/
95.	case report/
96.	(letter or comment*).ti.
97.	or/5-12
98.	randomized controlled trial/ or random*.ti,ab.
99.	13 not 14
100.	animals/ not humans/

101.	exp Animals, Laboratory/
102.	exp Animal Experimentation/
103.	exp Models, Animal/
104.	exp Rodentia/
105.	(rat or rats or mouse or mice).ti.
106.	or/15-21
107.	4 not 22
108.	limit 23 to English language
109.	Economics/
110.	Value of life/
111.	exp "Costs and Cost Analysis"/
112.	exp Economics, Hospital/
113.	exp Economics, Medical/
114.	Economics, Nursing/
115.	Economics, Pharmaceutical/
116.	exp "Fees and Charges"/
117.	exp Budgets/
118.	budget*.ti,ab.
119.	cost*.ti.
120.	(economic* or pharmaco?economic*).ti.
121.	(price* or pricing*).ti,ab.
122.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
123.	(financ* or fee or fees).ti,ab.
124.	(value adj2 (money or monetary)).ti,ab.
125.	or/25-40
126.	24 and 41

Embase (Ovid) search terms

75.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
76.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
77.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
78.	or/1-3
79.	letter.pt. or letter/
80.	note.pt.
81.	editorial.pt.
82.	case report/ or case study/
83.	(letter or comment*).ti.
84.	or/5-9
85.	randomized controlled trial/ or random*.ti,ab.
86.	10 not 11
87.	animal/ not human/
88.	nonhuman/

89.	exp Animal Experiment/
90.	exp Experimental Animal/
91.	animal model/
92.	exp Rodent/
93.	(rat or rats or mouse or mice).ti.
94.	or/12-19
95.	4 not 20
96.	limit 21 to English language
97.	health economics/
98.	exp economic evaluation/
99.	exp health care cost/
100.	exp fee/
101.	budget/
102.	funding/
103.	budget*.ti,ab.
104.	cost*.ti.
105.	(economic* or pharmaco?economic*).ti.
106.	(price* or pricing*).ti,ab.
107.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
108.	(financ* or fee or fees).ti,ab.
109.	(value adj2 (money or monetary)).ti,ab.
110.	or/23-35
111.	22 and 36

NHS EED and HTA (CRD) search terms

#27.	MeSH DESCRIPTOR arthroplasty
#28.	MeSH DESCRIPTOR arthroplasty, replacement
#29.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#30.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#31.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#32.	MeSH DESCRIPTOR hemiarthroplasty
#33.	MeSH DESCRIPTOR joint prosthesis
#34.	MeSH DESCRIPTOR hip prosthesis
#35.	MeSH DESCRIPTOR knee prosthesis
#36.	MeSH DESCRIPTOR shoulder prosthesis
#37.	(((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endopros* or implant* or artificial or arthroplast* or hemiarthroplast*)))
#38.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#39.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

Joint replacement search strategy 4

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014. {NICE2014}

For more detailed information, please see the Methodology Review. [Add cross reference]

A.8 Intraoperative anaesthetic hip approaches

A.9 Intraoperative anaesthetic knee approaches

A.10 Intraoperative anaesthetic shoulder approaches

A.10.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 7: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12	None
Epistemonikos	Inception – 01 May 2019	None

Medline (Ovid) search terms

218.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
219.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
220.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprothe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
221.	or/1-3
222.	letter/
223.	editorial/
224.	news/

225.	exp historical article/
226.	Anecdotes as Topic/
227.	comment/
228.	case report/
229.	(letter or comment*).ti.
230.	or/5-12
231.	randomized controlled trial/ or random*.ti,ab.
232.	13 not 14
233.	animals/ not humans/
234.	exp Animals, Laboratory/
235.	exp Animal Experimentation/
236.	exp Models, Animal/
237.	exp Rodentia/
238.	(rat or rats or mouse or mice).ti.
239.	or/15-21
240.	4 not 22
241.	limit 23 to English language
242.	exp Anesthesia/
243.	((an?esthet* or an?esthesia) adj4 (regional* or local* or general or spinal or epidural)).ti,ab.
244.	Nerve Block/
245.	((nerve* or neurax* or regional or peripheral*) adj3 block*).ti,ab.
246.	((plexus or sciatic* or interscalene or femor* or tibia* or posterior or obturator or fascia iliaca) adj3 block).ti,ab.
247.	(CNB or PNB or FNB or TNB or ONB or LPB or ISBB or FIB or LIA).ti,ab.
248.	((periarticular or local*) adj2 infiltration).ti,ab.
249.	or/25-31
250.	24 and 32
251.	randomized controlled trial.pt.
252.	controlled clinical trial.pt.
253.	randomi#ed.ti,ab.
254.	placebo.ab.
255.	randomly.ti,ab.
256.	Clinical Trials as topic.sh.
257.	trial.ti.
258.	or/34-40
259.	Meta-Analysis/
260.	exp Meta-Analysis as Topic/
261.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
262.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
263.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
264.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
265.	(search* adj4 literature).ab.
266.	(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.

267.	cochrane.jw.
268.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
269.	or/42-51
270.	Epidemiologic studies/
271.	Observational study/
272.	exp Cohort studies/
273.	(cohort adj (study or studies or analys* or data)).ti,ab.
274.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
275.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
276.	Controlled Before-After Studies/
277.	Historically Controlled Study/
278.	Interrupted Time Series Analysis/
279.	(before adj2 after adj2 (study or studies or data)).ti,ab.
280.	or/54-63
281.	exp case control study/
282.	case control*.ti,ab.
283.	or/65-66
284.	64 or 67
285.	Cross-sectional studies/
286.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
287.	or/69-70
288.	64 or 71
289.	64 or 67 or 71
290.	33 and (41 or 52 or 72)

Embase (Ovid) search terms

222.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
223.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
224.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
225.	or/1-3
226.	letter.pt. or letter/
227.	note.pt.
228.	editorial.pt.
229.	case report/ or case study/
230.	(letter or comment*).ti.
231.	or/5-9
232.	randomized controlled trial/ or random*.ti,ab.
233.	10 not 11
234.	animal/ not human/
235.	nonhuman/
236.	exp Animal Experiment/
237.	exp Experimental Animal/
238.	animal model/

239.	exp Rodent/
240.	(rat or rats or mouse or mice).ti.
241.	or/12-19
242.	4 not 20
243.	limit 21 to English language
244.	*anesthesia/ or general anesthesia/ or regional anesthesia/
245.	((an?esthet* or an?esthesia) adj4 (regional* or local* or general or spinal or epidural)).ti,ab.
246.	nerve block/
247.	((nerve* or neurax* or regional or peripheral*) adj3 block*).ti,ab.
248.	((plexus or sciatic* or interscalene or femor* or tibia* or posterior or obturator or fascia iliaca) adj3 block).ti,ab.
249.	(CNB or PNB or FNB or TNB or ONB or LPB or ISBB or FIB or LIA).ti,ab.
250.	((periarticular or local*) adj2 infiltration).ti,ab.
251.	or/23-29
252.	22 and 30
253.	random*.ti,ab.
254.	factorial*.ti,ab.
255.	(crossover* or cross over*).ti,ab.
256.	((doubl* or singl*) adj blind*).ti,ab.
257.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
258.	crossover procedure/
259.	single blind procedure/
260.	randomized controlled trial/
261.	double blind procedure/
262.	or/32-40
263.	systematic review/
264.	meta-analysis/
265.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
266.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
267.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
268.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
269.	(search* adj4 literature).ab.
270.	(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.
271.	cochrane.jw.
272.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
273.	or/42-51
274.	Clinical study/
275.	Observational study/
276.	family study/
277.	longitudinal study/
278.	retrospective study/
279.	prospective study/
280.	cohort analysis/

281.	follow-up/
282.	cohort*.ti,ab.
283.	61 and 62
284.	(cohort adj (study or studies or analys* or data)).ti,ab.
285.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
286.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
287.	(before adj2 after adj2 (study or studies or data)).ti,ab.
288.	or/54-60,63-67
289.	exp case control study/
290.	case control*.ti,ab.
291.	or/69-70
292.	68 or 71
293.	cross-sectional study/
294.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
295.	or/73-74
296.	68 or 75
297.	68 or 71 or 75
298.	31 and (41 or 52 or 76)

Cochrane Library (Wiley) search terms

#75.	MeSH descriptor: [Arthroplasty] this term only
#76.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#77.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#78.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#79.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#80.	MeSH descriptor: [Hemiarthroplasty] this term only
#81.	(or #1-#6)
#82.	MeSH descriptor: [Joint Prosthesis] this term only
#83.	MeSH descriptor: [Hip Prosthesis] this term only
#84.	MeSH descriptor: [Knee Prosthesis] this term only
#85.	MeSH descriptor: [Shoulder Prosthesis] this term only
#86.	(or #8-#11)
#87.	((joint* or knee* or shoulder* or hip*) near/5 (surger* or replace* or prosthe* or endoprothe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#88.	(or #7, #12-#13)
#89.	MeSH descriptor: [Anesthesia] explode all trees
#90.	((anaesthet* or anesthet* or anaesthesia or anesthesia) near/4 (regional* or local* or general or spinal or epidural)):ti,ab
#91.	MeSH descriptor: [Nerve Block] this term only
#92.	((nerve* or neurax* or regional or peripheral*) near/3 block*):ti,ab
#93.	((plexus or sciatic* or interscalene or femor* or tibia* or posterior or obturator or fascia iliaca) near/3 block):ti,ab
#94.	(CNB or PNB or FNB or TNB or ONB or LPB or ISBB or FIB or LIA):ti,ab
#95.	((periarticular or local*) near/2 infiltration):ti,ab
#96.	(or #15-#21)

#97.	#14 and #22
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Epistemonikos search terms

3.	((joint* OR knee* OR shoulder* OR hip*) AND (surger* OR replace* OR prosth* OR endoprosth* OR implant* OR artificial OR arthroplast* OR hemiarthroplast*)) AND (((an?esthet* OR an?esthesia) AND (regional* OR local* OR general OR spinal OR epidural)) OR ((nerve* OR neurax* OR regional OR peripheral*) AND block*) OR ((plexus OR sciatic* OR interscalene OR femor* OR tibia* OR posterior OR obturator OR fascia iliaca) AND block) OR (CNB OR PNB OR FNB OR TNB OR ONB OR LPB OR ISBB OR FIB OR LIA) OR ((periarticular OR local*) AND infiltration)) [Filters: protocol=no, classification=systematic-review]
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A.10.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 8: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

127.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
128.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
129.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
130.	or/1-3
131.	letter/
132.	editorial/
133.	news/
134.	exp historical article/
135.	Anecdotes as Topic/
136.	comment/
137.	case report/
138.	(letter or comment*).ti.
139.	or/5-12
140.	randomized controlled trial/ or random*.ti,ab.
141.	13 not 14

142.	animals/ not humans/
143.	exp Animals, Laboratory/
144.	exp Animal Experimentation/
145.	exp Models, Animal/
146.	exp Rodentia/
147.	(rat or rats or mouse or mice).ti.
148.	or/15-21
149.	4 not 22
150.	limit 23 to English language
151.	Economics/
152.	Value of life/
153.	exp "Costs and Cost Analysis"/
154.	exp Economics, Hospital/
155.	exp Economics, Medical/
156.	Economics, Nursing/
157.	Economics, Pharmaceutical/
158.	exp "Fees and Charges"/
159.	exp Budgets/
160.	budget*.ti,ab.
161.	cost*.ti.
162.	(economic* or pharmaco?economic*).ti.
163.	(price* or pricing*).ti,ab.
164.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
165.	(financ* or fee or fees).ti,ab.
166.	(value adj2 (money or monetary)).ti,ab.
167.	or/25-40
168.	24 and 41

Embase (Ovid) search terms

112.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
113.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
114.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
115.	or/1-3
116.	letter.pt. or letter/
117.	note.pt.
118.	editorial.pt.
119.	case report/ or case study/
120.	(letter or comment*).ti.
121.	or/5-9
122.	randomized controlled trial/ or random*.ti,ab.
123.	10 not 11

124.	animal/ not human/
125.	nonhuman/
126.	exp Animal Experiment/
127.	exp Experimental Animal/
128.	animal model/
129.	exp Rodent/
130.	(rat or rats or mouse or mice).ti.
131.	or/12-19
132.	4 not 20
133.	limit 21 to English language
134.	health economics/
135.	exp economic evaluation/
136.	exp health care cost/
137.	exp fee/
138.	budget/
139.	funding/
140.	budget*.ti,ab.
141.	cost*.ti.
142.	(economic* or pharmaco?economic*).ti.
143.	(price* or pricing*).ti,ab.
144.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
145.	(financ* or fee or fees).ti,ab.
146.	(value adj2 (money or monetary)).ti,ab.
147.	or/23-35
148.	22 and 36

NHS EED and HTA (CRD) search terms

#40.	MeSH DESCRIPTOR arthroplasty
#41.	MeSH DESCRIPTOR arthroplasty, replacement
#42.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#43.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#44.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#45.	MeSH DESCRIPTOR hemiarthroplasty
#46.	MeSH DESCRIPTOR joint prosthesis
#47.	MeSH DESCRIPTOR hip prosthesis
#48.	MeSH DESCRIPTOR knee prosthesis
#49.	MeSH DESCRIPTOR shoulder prosthesis
#50.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprothe* or implant* or artificial or arthroplast* or hemiarthroplast*))
#51.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#52.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

Joint replacement search strategy 5

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.11 Tranexamic acid

A.11.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 9: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12	None

Medline (Ovid) search terms

291.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
292.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
293.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
294.	or/1-3
295.	letter/
296.	editorial/
297.	news/
298.	exp historical article/
299.	Anecdotes as Topic/
300.	comment/
301.	case report/
302.	(letter or comment*).ti.
303.	or/5-12
304.	randomized controlled trial/ or random*.ti,ab.
305.	13 not 14

306.	animals/ not humans/
307.	exp Animals, Laboratory/
308.	exp Animal Experimentation/
309.	exp Models, Animal/
310.	exp Rodentia/
311.	(rat or rats or mouse or mice).ti.
312.	or/15-21
313.	4 not 22
314.	limit 23 to English language
315.	Tranexamic Acid/
316.	(tranexamic or txa or cyklokapron).ti,ab.
317.	or/25-26
318.	24 and 27
319.	randomized controlled trial.pt.
320.	controlled clinical trial.pt.
321.	randomi#ed.ti,ab.
322.	placebo.ab.
323.	randomly.ti,ab.
324.	Clinical Trials as topic.sh.
325.	trial.ti.
326.	or/29-35
327.	Meta-Analysis/
328.	exp Meta-Analysis as Topic/
329.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
330.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
331.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
332.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
333.	(search* adj4 literature).ab.
334.	(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.
335.	cochrane.jw.
336.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
337.	or/37-46
338.	Epidemiologic studies/
339.	Observational study/
340.	exp Cohort studies/
341.	(cohort adj (study or studies or analys* or data)).ti,ab.
342.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
343.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
344.	Controlled Before-After Studies/
345.	Historically Controlled Study/
346.	Interrupted Time Series Analysis/
347.	(before adj2 after adj2 (study or studies or data)).ti,ab.

348.	or/48-57
349.	exp case control study/
350.	case control*.ti,ab.
351.	or/59-60
352.	58 or 61
353.	Cross-sectional studies/
354.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
355.	or/63-64
356.	58 or 65
357.	58 or 61 or 65
358.	28 and (36 or 47 or 67)

Embase (Ovid) search terms

299.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
300.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
301.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endopros* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
302.	or/1-3
303.	letter.pt. or letter/
304.	note.pt.
305.	editorial.pt.
306.	case report/ or case study/
307.	(letter or comment*).ti.
308.	or/5-9
309.	randomized controlled trial/ or random*.ti,ab.
310.	10 not 11
311.	animal/ not human/
312.	nonhuman/
313.	exp Animal Experiment/
314.	exp Experimental Animal/
315.	animal model/
316.	exp Rodent/
317.	(rat or rats or mouse or mice).ti.
318.	or/12-19
319.	4 not 20
320.	limit 21 to English language
321.	tranexamic acid/
322.	(tranexamic or txa or cyklokapron).ti,ab.
323.	1197-18-8.rn.
324.	or/23-25
325.	22 and 26
326.	random*.ti,ab.
327.	factorial*.ti,ab.
328.	(crossover* or cross over*).ti,ab.
329.	((doubl* or singl*) adj blind*).ti,ab.

330.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
331.	crossover procedure/
332.	single blind procedure/
333.	randomized controlled trial/
334.	double blind procedure/
335.	or/28-36
336.	systematic review/
337.	meta-analysis/
338.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
339.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
340.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
341.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
342.	(search* adj4 literature).ab.
343.	(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.
344.	cochrane.jw.
345.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
346.	or/38-47
347.	Clinical study/
348.	Observational study/
349.	family study/
350.	longitudinal study/
351.	retrospective study/
352.	prospective study/
353.	cohort analysis/
354.	follow-up/
355.	cohort*.ti,ab.
356.	56 and 57
357.	(cohort adj (study or studies or analys* or data)).ti,ab.
358.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
359.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
360.	(before adj2 after adj2 (study or studies or data)).ti,ab.
361.	or/49-55,58-62
362.	exp case control study/
363.	case control*.ti,ab.
364.	or/64-65
365.	63 or 66
366.	cross-sectional study/
367.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
368.	or/68-69
369.	63 or 70
370.	63 or 66 or 70
371.	27 and (37 or 48 or 72)

Cochrane Library (Wiley) search terms

#98.	MeSH descriptor: [Arthroplasty] this term only
#99.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#100.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#101.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#102.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#103.	MeSH descriptor: [Hemiarthroplasty] this term only
#104.	(or #1-#6)
#105.	MeSH descriptor: [Joint Prosthesis] this term only
#106.	MeSH descriptor: [Hip Prosthesis] this term only
#107.	MeSH descriptor: [Knee Prosthesis] this term only
#108.	MeSH descriptor: [Shoulder Prosthesis] this term only
#109.	(or #8-#11)
#110.	((joint* or knee* or shoulder* or hip*) near/5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#111.	(or #7, #12-#13)
#112.	MeSH descriptor: [Tranexamic Acid] this term only
#113.	(tranexamic or txa or cyklokapron):ti,ab
#114.	#15 OR #16
#115.	#14 AND #17

A.11.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 10: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

169.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
170.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
171.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab.
172.	or/1-3

173.	letter/
174.	editorial/
175.	news/
176.	exp historical article/
177.	Anecdotes as Topic/
178.	comment/
179.	case report/
180.	(letter or comment*).ti.
181.	or/5-12
182.	randomized controlled trial/ or random*.ti,ab.
183.	13 not 14
184.	animals/ not humans/
185.	exp Animals, Laboratory/
186.	exp Animal Experimentation/
187.	exp Models, Animal/
188.	exp Rodentia/
189.	(rat or rats or mouse or mice).ti.
190.	or/15-21
191.	4 not 22
192.	limit 23 to English language
193.	Economics/
194.	Value of life/
195.	exp "Costs and Cost Analysis"/
196.	exp Economics, Hospital/
197.	exp Economics, Medical/
198.	Economics, Nursing/
199.	Economics, Pharmaceutical/
200.	exp "Fees and Charges"/
201.	exp Budgets/
202.	budget*.ti,ab.
203.	cost*.ti.
204.	(economic* or pharmaco?economic*).ti.
205.	(price* or pricing*).ti,ab.
206.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)),ab.
207.	(financ* or fee or fees).ti,ab.
208.	(value adj2 (money or monetary)).ti,ab.
209.	or/25-40
210.	24 and 41

Embase (Ovid) search terms

149.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
150.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
151.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)),ti,ab.

152.	or/1-3
153.	letter.pt. or letter/
154.	note.pt.
155.	editorial.pt.
156.	case report/ or case study/
157.	(letter or comment*).ti.
158.	or/5-9
159.	randomized controlled trial/ or random*.ti,ab.
160.	10 not 11
161.	animal/ not human/
162.	nonhuman/
163.	exp Animal Experiment/
164.	exp Experimental Animal/
165.	animal model/
166.	exp Rodent/
167.	(rat or rats or mouse or mice).ti.
168.	or/12-19
169.	4 not 20
170.	limit 21 to English language
171.	health economics/
172.	exp economic evaluation/
173.	exp health care cost/
174.	exp fee/
175.	budget/
176.	funding/
177.	budget*.ti,ab.
178.	cost*.ti.
179.	(economic* or pharmaco?economic*).ti.
180.	(price* or pricing*).ti,ab.
181.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
182.	(financ* or fee or fees).ti,ab.
183.	(value adj2 (money or monetary)).ti,ab.
184.	or/23-35
185.	22 and 36

NHS EED and HTA (CRD) search terms

#53.	MeSH DESCRIPTOR arthroplasty
#54.	MeSH DESCRIPTOR arthroplasty, replacement
#55.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#56.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#57.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#58.	MeSH DESCRIPTOR hemiarthroplasty

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#59.	MeSH DESCRIPTOR joint prosthesis
#60.	MeSH DESCRIPTOR hip prosthesis
#61.	MeSH DESCRIPTOR knee prosthesis
#62.	MeSH DESCRIPTOR shoulder prosthesis
#63.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*))
#64.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#65.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

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Joint replacement search strategy 6

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.12 Wound lavage

A.12.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 11: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12 DARE, and NHSEED to 2015 Issue 2 of 4 HTA to 2016 Issue 4 of 4	None

Medline (Ovid) search terms

359.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
360.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
361.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
362.	or/1-3
363.	letter/
364.	editorial/
365.	news/
366.	exp historical article/
367.	Anecdotes as Topic/
368.	comment/
369.	case report/
370.	(letter or comment*).ti.
371.	or/5-12

372.	randomized controlled trial/ or random*.ti,ab.
373.	13 not 14
374.	animals/ not humans/
375.	exp Animals, Laboratory/
376.	exp Animal Experimentation/
377.	exp Models, Animal/
378.	exp Rodentia/
379.	(rat or rats or mouse or mice).ti.
380.	or/15-21
381.	4 not 22
382.	limit 23 to English language
383.	Therapeutic Irrigation/
384.	(irrigat* or lavage or douch*).ti,ab.
385.	(wound* adj5 (clean* or decontaminat* or soak* or rins* or wash*)).ti,ab.
386.	(water or H2O or saline or solution* or soap* or detergent*).ti,ab.
387.	((Intraoperative or intra-operative or operative or surg*) adj3 (clean* or decontaminat* or soak* or rins* or wash*)).ti,ab.
388.	((medicat* or pump* or power-puls* or puls* or power assist* or assist* or pressure* or manual) adj3 (wash* or clean*)).ti,ab.
389.	Saline Solution, Hypertonic/
390.	Detergents/
391.	Soaps/
392.	Water/
393.	Solutions/
394.	or/25-35
395.	Anti-bacterial agents/
396.	Cephalosporins/
397.	Vancomycin/
398.	Gentamicins/
399.	Bacitracin/
400.	(antibiotic* or anti-biotic* or antibacteri* or anti-bacteri* or cephalosporin* or vancomycin or gentamicin* or bacitracin).ti,ab.
401.	or/37-42
402.	Anti-Infective Agents, Local/
403.	Chlorhexidine/
404.	Hydrogen Peroxide/
405.	Povidone-Iodine/
406.	Iodine/
407.	Hypochlorous Acid/
408.	(antiseptic* or antimicrobi* or anti-microbi* or anti-infecti* or antiinfective or chlorhexidine* or peroxide* or povidone* or iodine or betadine or hypochlor*).ti,ab.
409.	or/44-50
410.	24 and (36 or 43 or 51)
411.	randomized controlled trial.pt.
412.	controlled clinical trial.pt.
413.	randomi#ed.ti,ab.

414.	placebo.ab.
415.	randomly.ti,ab.
416.	Clinical Trials as topic.sh.
417.	trial.ti.
418.	or/53-59
419.	Meta-Analysis/
420.	exp Meta-Analysis as Topic/
421.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
422.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
423.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
424.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
425.	(search* adj4 literature).ab.
426.	(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.
427.	cochrane.jw.
428.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
429.	or/61-70
430.	Epidemiologic studies/
431.	Observational study/
432.	exp Cohort studies/
433.	(cohort adj (study or studies or analys* or data)).ti,ab.
434.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
435.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
436.	Controlled Before-After Studies/
437.	Historically Controlled Study/
438.	Interrupted Time Series Analysis/
439.	(before adj2 after adj2 (study or studies or data)).ti,ab.
440.	or/73-82
441.	exp case control study/
442.	case control*.ti,ab.
443.	or/84-85
444.	83 or 86
445.	Cross-sectional studies/
446.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
447.	or/88-89
448.	83 or 90
449.	83 or 86 or 90
450.	52 and (60 or 71 or 91)

Embase (Ovid) search terms

372.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
373.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/

374.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
375.	or/1-3
376.	letter.pt. or letter/
377.	note.pt.
378.	editorial.pt.
379.	case report/ or case study/
380.	(letter or comment*).ti.
381.	or/5-9
382.	randomized controlled trial/ or random*.ti,ab.
383.	10 not 11
384.	animal/ not human/
385.	nonhuman/
386.	exp Animal Experiment/
387.	exp Experimental Animal/
388.	animal model/
389.	exp Rodent/
390.	(rat or rats or mouse or mice).ti.
391.	or/12-19
392.	4 not 20
393.	limit 21 to English language
394.	lavage/
395.	(irrigat* or lavage or douch*).ti,ab.
396.	(wound* adj5 (clean* or decontaminat* or soak* or rins* or wash*)).ti,ab.
397.	(water or H2O or saline or solution* or soap* or detergent*).ti,ab.
398.	((Intraoperative or intra-operative or operative or surg*) adj3 (clean* or decontaminat* or soak* or rins* or wash*)).ti,ab.
399.	((medicat* or pump* or power-puls* or puls* or power assist* or assist* or pressure* or manual) adj3 (wash* or clean*)).ti,ab.
400.	hypertonic solution/
401.	detergent/
402.	soap/
403.	water/
404.	"solution and solubility"/
405.	or/23-33
406.	antibiotic agent/
407.	cephalosporin derivative/
408.	vancomycin/
409.	gentamicin/
410.	bacitracin/
411.	(antibiotic* or anti-biotic* or antibacteri* or anti-bacteri* or cephalosporin* or vancomycin or gentamicin* or bacitracin).ti,ab.
412.	or/35-40
413.	antiinfective agent/
414.	chlorhexidine/
415.	hydrogen peroxide/

416.	povidone iodine/
417.	iodine/
418.	hypochlorous acid/
419.	(antiseptic* or antimicrobi* or anti-microbi* or anti-infecti* or antiinfective or chlorhexidine* or peroxide* or povidone* or iodine or betadine or hypochlor*).ti,ab.
420.	or/42-48
421.	22 and (34 or 41 or 49)
422.	random*.ti,ab.
423.	factorial*.ti,ab.
424.	(crossover* or cross over*).ti,ab.
425.	((doubl* or singl*) adj blind*).ti,ab.
426.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
427.	crossover procedure/
428.	single blind procedure/
429.	randomized controlled trial/
430.	double blind procedure/
431.	or/51-59
432.	systematic review/
433.	meta-analysis/
434.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
435.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
436.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
437.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
438.	(search* adj4 literature).ab.
439.	(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.
440.	cochrane.jw.
441.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
442.	or/61-70
443.	Clinical study/
444.	Observational study/
445.	family study/
446.	longitudinal study/
447.	retrospective study/
448.	prospective study/
449.	cohort analysis/
450.	follow-up/
451.	cohort*.ti,ab.
452.	80 and 81
453.	(cohort adj (study or studies or analys* or data)).ti,ab.
454.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
455.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
456.	(before adj2 after adj2 (study or studies or data)).ti,ab.

457.	or/73-79,82-86
458.	exp case control study/
459.	case control*.ti,ab.
460.	or/88-89
461.	87 or 90
462.	cross-sectional study/
463.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
464.	or/92-93
465.	87 or 94
466.	87 or 90 or 94
467.	50 and (60 or 71 or 95)

Cochrane Library (Wiley) search terms

#116.	MeSH descriptor: [Arthroplasty] this term only
#117.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#118.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#119.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#120.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#121.	MeSH descriptor: [Hemiarthroplasty] this term only
#122.	(or #1-#6)
#123.	MeSH descriptor: [Joint Prosthesis] this term only
#124.	MeSH descriptor: [Hip Prosthesis] this term only
#125.	MeSH descriptor: [Knee Prosthesis] this term only
#126.	MeSH descriptor: [Shoulder Prosthesis] this term only
#127.	(or #8-#11)
#128.	((joint* or knee* or shoulder* or hip*) near/5 (surger* or replace* or prosthe* or endoprothe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#129.	(or #7, #12-#13)
#130.	MeSH descriptor: [Therapeutic Irrigation] this term only
#131.	(irrigat* or lavage or douch*):ti,ab
#132.	(wound* near/5 (clean* or decontaminat* or soak* or rins* or wash*)):ti,ab
#133.	(water or H2O or saline or solution* or soap* or detergent*):ti,ab
#134.	((Intraoperative or intra-operative or operative or surg*) near/3 (clean* or decontaminat* or soak* or rins* or wash*)):ti,ab
#135.	((medicat* or pump* or power-puls* or puls* or power assist* or assist* or pressure* or manual) near/3 (wash* or clean*)):ti,ab
#136.	MeSH descriptor: [Saline Solution, Hypertonic] this term only
#137.	MeSH descriptor: [Detergents] this term only
#138.	MeSH descriptor: [Soaps] this term only
#139.	MeSH descriptor: [Water] this term only
#140.	MeSH descriptor: [Solutions] this term only
#141.	(or #15-#25)
#142.	MeSH descriptor: [Anti-Bacterial Agents] this term only
#143.	MeSH descriptor: [Cephalosporins] this term only
#144.	MeSH descriptor: [Vancomycin] this term only
#145.	MeSH descriptor: [Gentamicins] this term only

#146.	MeSH descriptor: [Bacitracin] this term only
#147.	(antibiotic* or anti-biotic* or antibacteri* or anti-bacteri* or cephalosporin* or vancomycin or gentamicin* or bacitracin):ti,ab
#148.	(or #27-#32)
#149.	MeSH descriptor: [Anti-Infective Agents, Local] this term only
#150.	MeSH descriptor: [Chlorhexidine] this term only
#151.	MeSH descriptor: [Hydrogen Peroxide] this term only
#152.	MeSH descriptor: [Povidone-Iodine] this term only
#153.	MeSH descriptor: [Iodine] this term only
#154.	MeSH descriptor: [Hypochlorous Acid] this term only
#155.	(antiseptic* or antimicrobi* or anti-microbi* or anti-infecti* or antiinfective or chlorhexidine* or peroxide* or povidone* or iodine or betadine or hypochlor*):ti,ab
#156.	(or #34-#40)
#157.	#14 and (or #26, #33, #41)

A.12.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 12: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

211.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
212.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
213.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab.
214.	or/1-3
215.	letter/
216.	editorial/
217.	news/
218.	exp historical article/
219.	Anecdotes as Topic/
220.	comment/

221.	case report/
222.	(letter or comment*).ti.
223.	or/5-12
224.	randomized controlled trial/ or random*.ti,ab.
225.	13 not 14
226.	animals/ not humans/
227.	exp Animals, Laboratory/
228.	exp Animal Experimentation/
229.	exp Models, Animal/
230.	exp Rodentia/
231.	(rat or rats or mouse or mice).ti.
232.	or/15-21
233.	4 not 22
234.	limit 23 to English language
235.	Economics/
236.	Value of life/
237.	exp "Costs and Cost Analysis"/
238.	exp Economics, Hospital/
239.	exp Economics, Medical/
240.	Economics, Nursing/
241.	Economics, Pharmaceutical/
242.	exp "Fees and Charges"/
243.	exp Budgets/
244.	budget*.ti,ab.
245.	cost*.ti.
246.	(economic* or pharmaco?economic*).ti.
247.	(price* or pricing*).ti,ab.
248.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
249.	(financ* or fee or fees).ti,ab.
250.	(value adj2 (money or monetary)).ti,ab.
251.	or/25-40
252.	24 and 41

Embase (Ovid) search terms

186.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
187.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
188.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
189.	or/1-3
190.	letter.pt. or letter/
191.	note.pt.
192.	editorial.pt.
193.	case report/ or case study/
194.	(letter or comment*).ti.

195.	or/5-9
196.	randomized controlled trial/ or random*.ti,ab.
197.	10 not 11
198.	animal/ not human/
199.	nonhuman/
200.	exp Animal Experiment/
201.	exp Experimental Animal/
202.	animal model/
203.	exp Rodent/
204.	(rat or rats or mouse or mice).ti.
205.	or/12-19
206.	4 not 20
207.	limit 21 to English language
208.	health economics/
209.	exp economic evaluation/
210.	exp health care cost/
211.	exp fee/
212.	budget/
213.	funding/
214.	budget*.ti,ab.
215.	cost*.ti.
216.	(economic* or pharmaco?economic*).ti.
217.	(price* or pricing*).ti,ab.
218.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
219.	(financ* or fee or fees).ti,ab.
220.	(value adj2 (money or monetary)).ti,ab.
221.	or/23-35
222.	22 and 36

NHS EED and HTA (CRD) search terms

#66.	MeSH DESCRIPTOR arthroplasty
#67.	MeSH DESCRIPTOR arthroplasty, replacement
#68.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#69.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#70.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#71.	MeSH DESCRIPTOR hemiarthroplasty
#72.	MeSH DESCRIPTOR joint prosthesis
#73.	MeSH DESCRIPTOR hip prosthesis
#74.	MeSH DESCRIPTOR knee prosthesis
#75.	MeSH DESCRIPTOR shoulder prosthesis
#76.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*))
#77.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN

	NHSEED
#78.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

Joint replacement search strategy 7

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014. {NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.13 Ultra clean-air theatres

A.13.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 13: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions
Embase (OVID)	1974 – 01 May 2019	Exclusions
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12 DARE, and NHSEED to 2015 Issue 2 of 4 HTA to 2016 Issue 4 of 4	None

Medline (Ovid) search terms

451.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
452.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
453.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
454.	or/1-3
455.	Orthopedics/
456.	Orthopedic Procedures/
457.	(orthopedic* or orthopaedic*).ti,ab.
458.	Metal-on-Metal Joint Prostheses/
459.	Fracture Fixation, Internal/
460.	exp Internal Fixators/
461.	(metal* adj3 (prosth* or implant* or fixator* or nail* or plate* or screw* or wire* or pin* or rod*)).ti,ab.
462.	dynamic compression plate*.ti,ab.
463.	((surgical or fracture*) adj2 fixation*).ti,ab.
464.	osteosynthes*.ti,ab.

465.	(open reduction adj2 internal fixation*).ti,ab.
466.	ORIF.ti,ab.
467.	Spinal Fusion/
468.	((spine or spinal or vertebral or anterior or posterior or posterolateral or postero lateral or transforaminal or trans foraminal or interbody or inter body) adj3 fusion*).ti,ab.
469.	(PLF or ALIF or PLIF or TLIF or DLIF or XLIF).ti,ab.
470.	(spondylodesis or spondylosyndesis).ti,ab.
471.	or/5-20
472.	4 or 21
473.	letter/
474.	editorial/
475.	news/
476.	exp historical article/
477.	Anecdotes as Topic/
478.	comment/
479.	case report/
480.	(letter or comment*).ti.
481.	or/23-30
482.	randomized controlled trial/ or random*.ti,ab.
483.	31 not 32
484.	animals/ not humans/
485.	exp Animals, Laboratory/
486.	exp Animal Experimentation/
487.	exp Models, Animal/
488.	exp Rodentia/
489.	(rat or rats or mouse or mice).ti.
490.	or/33-39
491.	22 not 40
492.	limit 41 to English language
493.	Operating Rooms/
494.	Environment, Controlled/
495.	Ventilation/
496.	Air Filters/
497.	((operat* or surger* or surgical or theat* or room*) adj5 (ventilat* or air* or environment* or climate*).ti,ab.
498.	((air* or technolo*) adj3 (filter* or filtration or purifi* or purify* or condition* or quality)).ti,ab.
499.	(high efficiency particulate or HEPA).ti,ab.
500.	((exponential or vertical or horizontal or laminar or plenum or "ceiling to floor" or "wall mounted") adj3 air*).ti,ab.
501.	(LAF or Exflow).ti,ab.
502.	((ultraclean or clean* or Charnley or Howorth) adj3 (air* or ventilat* or enclosure* or technolo*).ti,ab.
503.	(UCA or UCV).ti,ab.
504.	or/43-53
505.	42 and 54

Embase (Ovid) search terms

468.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
469.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
470.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
471.	or/1-3
472.	*orthopedics/
473.	*orthopedic surgery/
474.	(orthopedic* or orthopaedic*).ti,ab.
475.	*metal on metal joint prosthesis/
476.	osteosynthesis/
477.	exp internal fixator/
478.	(metal* adj3 (prosth* or implant* or fixator* or nail* or plate* or screw* or wire* or pin* or rod*)).ti,ab.
479.	dynamic compression plate*.ti,ab.
480.	((surgical or fracture*) adj2 fixation*).ti,ab.
481.	osteosynthes*.ti,ab.
482.	(open reduction adj2 internal fixation*).ti,ab.
483.	ORIF.ti,ab.
484.	spine fusion/
485.	((spine or spinal or vertebral or anterior or posterior or posterolateral or postero lateral or transforaminal or trans foraminal or interbody or inter body) adj3 fusion*).ti,ab.
486.	(PLF or ALIF or PLIF or TLIF or DLIF or XLIF).ti,ab.
487.	(spondylodesis or spondylosyndesis).ti,ab.
488.	or/5-20
489.	4 or 21
490.	letter.pt. or letter/
491.	note.pt.
492.	editorial.pt.
493.	case report/ or case study/
494.	(letter or comment*).ti.
495.	or/23-27
496.	randomized controlled trial/ or random*.ti,ab.
497.	28 not 29
498.	animal/ not human/
499.	nonhuman/
500.	exp Animal Experiment/
501.	exp Experimental Animal/
502.	animal model/
503.	exp Rodent/
504.	(rat or rats or mouse or mice).ti.
505.	or/30-37
506.	22 not 38
507.	limit 39 to English language
508.	operating room/

509.	*microclimate/
510.	*air conditioning/
511.	*air filter/
512.	((operat* or surger* or surgical or theat* or room*) adj5 (ventilat* or air* or environment* or climate*)):ti,ab.
513.	((air* or technolo*) adj3 (filter* or filtration or purifi* or purify* or condition* or quality)):ti,ab.
514.	(high efficiency particulate or HEPA).ti,ab.
515.	((exponential or vertical or horizontal or laminar or plenum or "ceiling to floor" or "wall mounted") adj3 air*).ti,ab.
516.	(LAF or Exflow).ti,ab.
517.	((ultraclean or clean* or Charnley or Howorth) adj3 (air* or ventilat* or enclosure* or technolo*)):ti,ab.
518.	(UCA or UCV).ti,ab.
519.	or/41-51
520.	40 and 52

Cochrane Library (Wiley) search terms

#158.	MeSH descriptor: [Arthroplasty] this term only
#159.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#160.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#161.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#162.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#163.	MeSH descriptor: [Hemiarthroplasty] this term only
#164.	(or #1-#6)
#165.	MeSH descriptor: [Joint Prosthesis] this term only
#166.	MeSH descriptor: [Hip Prosthesis] this term only
#167.	MeSH descriptor: [Knee Prosthesis] this term only
#168.	MeSH descriptor: [Shoulder Prosthesis] this term only
#169.	(or #8-#11)
#170.	((joint* or knee* or shoulder* or hip*) near/5 (surger* or replace* or prosthe* or endopros* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#171.	(or #7, #12-#13)
#172.	MeSH descriptor: [Orthopedics] this term only
#173.	MeSH descriptor: [Orthopedic Procedures] this term only
#174.	(orthopedic* or orthopaedic*):ti,ab
#175.	MeSH descriptor: [Metal-on-Metal Joint Prostheses] this term only
#176.	MeSH descriptor: [Fracture Fixation, Internal] this term only
#177.	MeSH descriptor: [Internal Fixators] explode all trees
#178.	(metal* near/3 (prosthes* or implant* or fixator* or nail* or plate* or screw* or wire* or pin* or rod*)):ti,ab
#179.	dynamic compression plate*:ti,ab
#180.	((surgical or fracture*) near/2 fixation*):ti,ab
#181.	osteosynthes*:ti,ab
#182.	(open reduction near/2 internal fixation*) ti,ab
#183.	ORIF:ti,ab
#184.	MeSH descriptor: [Spinal Fusion] this term only

#185.	((spine or spinal or vertebral or anterior or posterior or posterolateral or postero lateral or transforaminal or trans foraminal or interbody or inter body) near/3 fusion*):ti,ab
#186.	(PLF or ALIF or PLIF or TLIF or DLIF or XLIF):ti,ab
#187.	(spondylodesis or spondylosyndesis):ti,ab
#188.	(or #15-#30)
#189.	#14 or #31
#190.	MeSH descriptor: [Operating Rooms] this term only
#191.	MeSH descriptor: [Environment, Controlled] this term only
#192.	MeSH descriptor: [Ventilation] explode all trees
#193.	MeSH descriptor: [Air Filters] this term only
#194.	((operat* or surger* or surgical or theat* or room*) near/5 (ventilat* or air* or environment* or climate*)):ti,ab
#195.	((air* or technolo*) near/3 (filter* or filtration or purifi* or purify* or condition* or quality)):ti,ab
#196.	(high efficiency particulate or HEPA):ti,ab
#197.	((exponential or vertical or horizontal or laminar or plenum or "ceiling to floor" or "wall mounted") near/3 air*):ti,ab
#198.	(LAF or Exflow):ti,ab
#199.	((ultraclean or clean* or Charnley or Howorth) near/3 (air* or ventilat* or enclosure* or technolo*)):ti,ab
#200.	(UCA or UCV):ti,ab
#201.	(or #33-#43)
#202.	#32 and #44

A.13.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 14: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 04 July 2018	Exclusions Health economics studies
Embase	2014 – 04 July 2018	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 04 July 2018 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

253.	Operating Rooms/
254.	Environment, Controlled/
255.	Ventilation/

256.	Air Filters/
257.	((operat* or surger* or surgical or theat* or room*) adj5 (ventilat* or air* or environment* or climate*)).ti,ab.
258.	((air* or technolo*) adj3 (filter* or filtration or purifi* or purify* or condition* or quality)).ti,ab.
259.	(high efficiency particulate or HEPA).ti,ab.
260.	((exponential or vertical or horizontal or laminar or plenum or "ceiling to floor" or "wall mounted") adj3 air*).ti,ab.
261.	(LAF or Exflow).ti,ab.
262.	((ultraclean or clean* or Charnley or Howorth) adj3 (air* or ventilat* or enclosure* or technolo*)).ti,ab.
263.	(UCA or UCV).ti,ab.
264.	or/1-11
265.	letter/
266.	editorial/
267.	news/
268.	exp historical article/
269.	Anecdotes as Topic/
270.	comment/
271.	case report/
272.	(letter or comment*).ti.
273.	or/13-20
274.	randomized controlled trial/ or random*.ti,ab.
275.	21 not 22
276.	animals/ not humans/
277.	exp Animals, Laboratory/
278.	exp Animal Experimentation/
279.	exp Models, Animal/
280.	exp Rodentia/
281.	(rat or rats or mouse or mice).ti.
282.	or/23-29
283.	12 not 30
284.	limit 31 to English language
285.	Economics/
286.	Value of life/
287.	exp "Costs and Cost Analysis"/
288.	exp Economics, Hospital/
289.	exp Economics, Medical/
290.	Economics, Nursing/
291.	Economics, Pharmaceutical/
292.	exp "Fees and Charges"/
293.	exp Budgets/
294.	budget*.ti,ab.
295.	cost*.ti.
296.	(economic* or pharmaco?economic*).ti.
297.	(price* or pricing*).ti,ab.

298.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)),ab.
299.	(financ* or fee or fees).ti,ab.
300.	(value adj2 (money or monetary)).ti,ab.
301.	or/33-48
302.	32 and 49

Embase (Ovid) search terms

223.	operating room/
224.	*microclimate/
225.	*air conditioning/
226.	*air filter/
227.	((operat* or surger* or surgical or theat* or room*) adj5 (ventilat* or air* or environment* or climate*)).ti,ab.
228.	((air* or technolo*) adj3 (filter* or filtration or purifi* or purify* or condition* or quality)).ti,ab.
229.	(high efficiency particulate or HEPA).ti,ab.
230.	((exponential or vertical or horizontal or laminar or plenum or "ceiling to floor" or "wall mounted") adj3 air*).ti,ab.
231.	(LAF or Exflow).ti,ab.
232.	((ultra clean or ultraclean or clean* or Charnley or Howorth) adj3 (air* or ventilat* or enclosure* or technolo*)).ti,ab.
233.	(UCA or UCV).ti,ab.
234.	or/1-11
235.	letter.pt. or letter/
236.	note.pt.
237.	editorial.pt.
238.	case report/ or case study/
239.	(letter or comment*).ti.
240.	or/13-17
241.	randomized controlled trial/ or random*.ti,ab.
242.	18 not 19
243.	animal/ not human/
244.	nonhuman/
245.	exp Animal Experiment/
246.	exp Experimental Animal/
247.	animal model/
248.	exp Rodent/
249.	(rat or rats or mouse or mice).ti.
250.	or/20-27
251.	12 not 28
252.	limit 29 to English language
253.	health economics/
254.	exp economic evaluation/

255.	exp health care cost/
256.	exp fee/
257.	budget/
258.	funding/
259.	budget*.ti,ab.
260.	cost*.ti.
261.	(economic* or pharmaco?economic*).ti.
262.	(price* or pricing*).ti,ab.
263.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
264.	(financ* or fee or fees).ti,ab.
265.	(value adj2 (money or monetary)).ti,ab.
266.	or/31-43
267.	30 and 44

NHS EED and HTA (CRD) search terms

#79.	MeSH DESCRIPTOR Operating Rooms
#80.	MeSH DESCRIPTOR Environment, Controlled
#81.	MeSH DESCRIPTOR Ventilation
#82.	MeSH DESCRIPTOR Air filters
#83.	(((operat* or surger* or surgical or theat* or room*) adj5 (ventilat* or air* or environment* or climate*)))
#84.	(((air* or technolo*) adj3 (filter* or filtration or purifi* or purify* or condition* or quality)))
#85.	(high efficiency particulate or HEPA)
#86.	(((exponential or vertical or horizontal or laminar or plenum or "ceiling to floor" or "wall mounted") adj3 air*))
#87.	(LAF or Exflow)
#88.	(((ultra clean or ultraclean or clean* or Charnley or Howorth) adj3 (air* or ventilat* or enclosure* or technolo*)))
#89.	(UCA or UCV)
#90.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA
#91.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED

Joint replacement search strategy 8

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.14 Reducing wrong impant selection during joint replacement

A.14.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 15: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12	None

Medline (Ovid) search terms

506.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/ or exp Maxillofacial Prosthesis Implantation/
507.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/ or eye, artificial/ or exp maxillofacial prosthesis/
508.	((joint* or knee* or shoulder* or hip* or ocular* or maxillofacial*) adj5 (surger* or replace* or prothe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
509.	((femoral or patellar or polyethylene or tibial or humeral or glenoid) adj2 component*).ti,ab.
510.	((femoral or humeral) adj2 (steam or head)) or (acetabular or liner)).ti,ab.
511.	Pacemaker, Artificial/ or Cardiac Pacing, Artificial/
512.	(pacemaker* adj3 (implant* or fit* or surg*)).ti,ab.
513.	or/1-7
514.	letter/
515.	editorial/
516.	news/
517.	exp historical article/
518.	Anecdotes as Topic/

519.	comment/
520.	case report/
521.	(letter or comment*).ti.
522.	or/9-16
523.	randomized controlled trial/ or random*.ti,ab.
524.	17 not 18
525.	animals/ not humans/
526.	exp Animals, Laboratory/
527.	exp Animal Experimentation/
528.	exp Models, Animal/
529.	exp Rodentia/
530.	(rat or rats or mouse or mice).ti.
531.	or/19-25
532.	8 not 26
533.	limit 27 to English language
534.	"Prostheses and Implants"/ae, st [Adverse Effects, Standards]
535.	(wrong* or incorrect* or erroneous or error* or mistak* or unsuitabl* or incompatibl*).ti,ab.
536.	medical errors/ or diagnostic errors/
537.	exp Malpractice/
538.	(malpractice* or negligen*).ti,ab.
539.	(confus* or disorganiz* or disorganis* or distract*).ti,ab.
540.	((never or sentinel) adj4 event*).ti,ab.
541.	or/29-35
542.	28 and 36
543.	randomized controlled trial.pt.
544.	controlled clinical trial.pt.
545.	randomi#ed.ti,ab.
546.	placebo.ab.
547.	randomly.ti,ab.
548.	Clinical Trials as topic.sh.
549.	trial.ti.
550.	or/38-44
551.	Meta-Analysis/
552.	exp Meta-Analysis as Topic/
553.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
554.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
555.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
556.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
557.	(search* adj4 literature).ab.
558.	(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.
559.	cochrane.jw.
560.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.

561.	or/46-55
562.	Epidemiologic studies/
563.	Observational study/
564.	exp Cohort studies/
565.	(cohort adj (study or studies or analys* or data)).ti,ab.
566.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
567.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
568.	Controlled Before-After Studies/
569.	Historically Controlled Study/
570.	Interrupted Time Series Analysis/
571.	(before adj2 after adj2 (study or studies or data)).ti,ab.
572.	or/57-66
573.	exp case control study/
574.	case control*.ti,ab.
575.	or/68-69
576.	67 or 70
577.	Cross-sectional studies/
578.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
579.	or/72-73
580.	67 or 74
581.	67 or 70 or 74
582.	37 and (45 or 56 or 76)

Embase (Ovid) search terms

521.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/ or *maxillofacial implant/
522.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/ or *maxillofacial prosthesis/
523.	((joint* or knee* or shoulder* or hip* or ocular* or maxillofacial*) adj5 (surger* or replace* or prothe* or endoproshe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
524.	((femoral or patellar or polyethylene or tibial or humeral or glenoid) adj2 component*).ti,ab.
525.	((femoral or humeral) adj2 (steam or head)) or (acetabular or liner)).ti,ab.
526.	*artificial heart pacemaker/ or *heart pacing/
527.	(pacemaker* adj3 (implant* or fit* or surg*)).ti,ab.
528.	or/1-7
529.	letter.pt. or letter/
530.	note.pt.
531.	editorial.pt.
532.	case report/ or case study/
533.	(letter or comment*).ti.
534.	or/9-13
535.	randomized controlled trial/ or random*.ti,ab.
536.	14 not 15
537.	animal/ not human/

538.	nonhuman/
539.	exp Animal Experiment/
540.	exp Experimental Animal/
541.	animal model/
542.	exp Rodent/
543.	(rat or rats or mouse or mice).ti.
544.	or/16-23
545.	8 not 24
546.	limit 25 to English language
547.	(wrong* or incorrect* or erroneous or error* or mistak* or unsuitabl* or incompatibl*).ti,ab.
548.	*medical error/ or *diagnostic error/
549.	*malpractice/
550.	(malpractice* or negligenc*).ti,ab.
551.	(confus* or disorganiz* or disorganiz* or distract*).ti,ab.
552.	((never or sentinel) adj4 event*).ti,ab.
553.	or/27-32
554.	26 and 33
555.	random*.ti,ab.
556.	factorial*.ti,ab.
557.	(crossover* or cross over*).ti,ab.
558.	((doubl* or singl*) adj blind*).ti,ab.
559.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
560.	crossover procedure/
561.	single blind procedure/
562.	randomized controlled trial/
563.	double blind procedure/
564.	or/35-43
565.	systematic review/
566.	meta-analysis/
567.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
568.	((systematic* or evidence*) adj3 (review* or overview*).ti,ab.
569.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
570.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
571.	(search* adj4 literature).ab.
572.	(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.
573.	cochrane.jw.
574.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
575.	or/45-54
576.	Clinical study/
577.	Observational study/
578.	family study/
579.	longitudinal study/

580.	retrospective study/
581.	prospective study/
582.	cohort analysis/
583.	follow-up/
584.	cohort*.ti,ab.
585.	63 and 64
586.	(cohort adj (study or studies or analys* or data)).ti,ab.
587.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
588.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
589.	(before adj2 after adj2 (study or studies or data)).ti,ab.
590.	or/56-62,65-69
591.	exp case control study/
592.	case control*.ti,ab.
593.	or/71-72
594.	70 or 73
595.	cross-sectional study/
596.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
597.	or/75-76
598.	70 or 77
599.	70 or 73 or 77
600.	34 and (44 or 55 or 79)

Cochrane Library (Wiley) search terms

#203.	MeSH descriptor: [Arthroplasty] this term only
#204.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#205.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#206.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#207.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#208.	MeSH descriptor: [Hemiarthroplasty] this term only
#209.	MeSH descriptor: [Maxillofacial Prosthesis Implantation] explode all trees
#210.	(or #1-#7)
#211.	MeSH descriptor: [Joint Prosthesis] this term only
#212.	MeSH descriptor: [Hip Prosthesis] this term only
#213.	MeSH descriptor: [Knee Prosthesis] this term only
#214.	MeSH descriptor: [Shoulder Prosthesis] this term only
#215.	MeSH descriptor: [Maxillofacial Prosthesis] explode all trees
#216.	(or #9-#13)
#217.	((joint* or knee* or shoulder* or hip* or ocular* or maxillofacial*) near/5 (surger* or replace* or prosth* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#218.	((femoral or humeral) near/2 (steam or head)) or (acetabular or liner)):ti,ab
#219.	((femoral or patellar or polyethylene or tibial or humeral or glenoid) near/2 component*):ti,ab
#220.	MeSH descriptor: [Pacemaker, Artificial] this term only
#221.	MeSH descriptor: [Cardiac Pacing, Artificial] this term only

#222.	(pacemaker* near/3 (implant* or fit* or surg*)):ti,ab
#223.	(or #15-#20)
#224.	(or #8, #14, #21)
#225.	(wrong* or incorrect* or erroneous or error* or mistak* or unsuitabl* or incompatibl*):ti,ab
#226.	MeSH descriptor: [Medical Errors] this term only
#227.	MeSH descriptor: [Diagnostic Errors] this term only
#228.	MeSH descriptor: [Malpractice] this term only
#229.	(malpractice* or negligen*):ti,ab
#230.	(confus* or disorganiz* or disorganis* or distract*):ti,ab
#231.	((never or sentinel) near/4 event*):ti,ab
#232.	(or #23-#29)
#233.	#22 AND #30

A.14.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 16: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

303.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
304.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
305.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoproshe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab.
306.	or/1-3
307.	letter/
308.	editorial/
309.	news/
310.	exp historical article/
311.	Anecdotes as Topic/
312.	comment/
313.	case report/
314.	(letter or comment*).ti.

315.	or/5-12
316.	randomized controlled trial/ or random*.ti,ab.
317.	13 not 14
318.	animals/ not humans/
319.	exp Animals, Laboratory/
320.	exp Animal Experimentation/
321.	exp Models, Animal/
322.	exp Rodentia/
323.	(rat or rats or mouse or mice).ti.
324.	or/15-21
325.	4 not 22
326.	limit 23 to English language
327.	Economics/
328.	Value of life/
329.	exp "Costs and Cost Analysis"/
330.	exp Economics, Hospital/
331.	exp Economics, Medical/
332.	Economics, Nursing/
333.	Economics, Pharmaceutical/
334.	exp "Fees and Charges"/
335.	exp Budgets/
336.	budget*.ti,ab.
337.	cost*.ti.
338.	(economic* or pharmaco?economic*).ti.
339.	(price* or pricing*).ti,ab.
340.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
341.	(financ* or fee or fees).ti,ab.
342.	(value adj2 (money or monetary)).ti,ab.
343.	or/25-40
344.	24 and 41

Embase (Ovid) search terms

268.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
269.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
270.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
271.	or/1-3
272.	letter.pt. or letter/
273.	note.pt.
274.	editorial.pt.
275.	case report/ or case study/
276.	(letter or comment*).ti.
277.	or/5-9

278.	randomized controlled trial/ or random*.ti,ab.
279.	10 not 11
280.	animal/ not human/
281.	nonhuman/
282.	exp Animal Experiment/
283.	exp Experimental Animal/
284.	animal model/
285.	exp Rodent/
286.	(rat or rats or mouse or mice).ti.
287.	or/12-19
288.	4 not 20
289.	limit 21 to English language
290.	health economics/
291.	exp economic evaluation/
292.	exp health care cost/
293.	exp fee/
294.	budget/
295.	funding/
296.	budget*.ti,ab.
297.	cost*.ti.
298.	(economic* or pharmaco?economic*).ti.
299.	(price* or pricing*).ti,ab.
300.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
301.	(financ* or fee or fees).ti,ab.
302.	(value adj2 (money or monetary)).ti,ab.
303.	or/23-35
304.	22 and 36

NHS EED and HTA (CRD) search terms

#92.	MeSH DESCRIPTOR arthroplasty
#93.	MeSH DESCRIPTOR arthroplasty, replacement
#94.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#95.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#96.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#97.	MeSH DESCRIPTOR hemiarthroplasty
#98.	MeSH DESCRIPTOR joint prosthesis
#99.	MeSH DESCRIPTOR hip prosthesis
#100.	MeSH DESCRIPTOR knee prosthesis
#101.	MeSH DESCRIPTOR shoulder prosthesis
#102.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*))
#103.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED

#104.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA
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Joint replacement search strategy 9

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.15 Total knee replacement versus partial knee replacement review

A.16 Total knee replacement with patella resurfacing versus total knee replacement without patella resurfacing versus total knee replacement with selective resurfacing review

A.16.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 17: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12	None

Medline (Ovid) search terms

583.	arthroplasty, replacement, knee/
584.	((joint* or knee*) adj3 (replace* or prosth* or endoprosth* or implant* or arthroplast*)).ti,ab.
585.	1 or 2
586.	letter/
587.	editorial/
588.	news/
589.	exp historical article/

590.	Anecdotes as Topic/
591.	comment/
592.	case report/
593.	(letter or comment*).ti.
594.	or/4-11
595.	randomized controlled trial/ or random*.ti,ab.
596.	12 not 13
597.	animals/ not humans/
598.	exp Animals, Laboratory/
599.	exp Animal Experimentation/
600.	exp Models, Animal/
601.	exp Rodentia/
602.	(rat or rats or mouse or mice).ti.
603.	or/14-20
604.	3 not 21
605.	limit 22 to English language
606.	(Total and (partial or unicompart* or unicondylar or compart* or resurf* or re-surf* or patell*).ti,ab.
607.	(partial and (Total or unicompart* or unicondylar or compart* or resurf* or re-surf* or patell*).ti,ab.
608.	((unicompart* or unicondylar or compart*) and (Total or partial or resurf* or re-surf* or patell*).ti,ab.
609.	((resurf* or re-surf* or patell*) and (Total or partial or unicondylar or unicompart* or compart*).ti,ab.
610.	((medial or lateral) adj3 (compart* or unicompart* or unicondylar)).ti,ab.
611.	or/24-28
612.	23 and 29
613.	randomized controlled trial.pt.
614.	controlled clinical trial.pt.
615.	randomi#ed.ti,ab.
616.	placebo.ab.
617.	randomly.ti,ab.
618.	Clinical Trials as topic.sh.
619.	trial.ti.
620.	or/31-37
621.	Meta-Analysis/
622.	exp Meta-Analysis as Topic/
623.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
624.	((systematic* or evidence*) adj3 (review* or overview*).ti,ab.
625.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
626.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
627.	(search* adj4 literature).ab.
628.	(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.
629.	cochrane.jw.

630.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
631.	or/39-48
632.	Epidemiologic studies/
633.	Observational study/
634.	exp Cohort studies/
635.	(cohort adj (study or studies or analys* or data)).ti,ab.
636.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
637.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
638.	Controlled Before-After Studies/
639.	Historically Controlled Study/
640.	Interrupted Time Series Analysis/
641.	(before adj2 after adj2 (study or studies or data)).ti,ab.
642.	or/51-60
643.	exp case control study/
644.	case control*.ti,ab.
645.	or/62-63
646.	61 or 64
647.	Cross-sectional studies/
648.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
649.	or/66-67
650.	61 or 68
651.	61 or 64 or 68
652.	30 and (38 or 49 or 69)

Embase (Ovid) search terms

601.	knee replacement/
602.	((joint* or knee*) adj3 (replace* or prosthe* or endoprosthe* or implant* or arthroplast*)).ti,ab.
603.	or/1-2
604.	letter.pt. or letter/
605.	note.pt.
606.	editorial.pt.
607.	case report/ or case study/
608.	(letter or comment*).ti.
609.	or/4-8
610.	randomized controlled trial/ or random*.ti,ab.
611.	9 not 10
612.	animal/ not human/
613.	nonhuman/
614.	exp Animal Experiment/
615.	exp Experimental Animal/
616.	animal model/
617.	exp Rodent/
618.	(rat or rats or mouse or mice).ti.

619.	or/11-18
620.	3 not 19
621.	limit 20 to English language
622.	(Total and (partial or unicompart* or unicondylar or compart* or resurf* or re-surf* or patell*)).ti,ab.
623.	(partial and (Total or unicompart* or unicondylar or compart* or resurf* or re-surf* or patell*)).ti,ab.
624.	((unicompart* or unicondylar or compart*) and (Total or partial or resurf* or re-surf* or patell*)).ti,ab.
625.	((resurf* or re-surf* or patell*) and (Total or partial or unicondylar or unicompart* or compart*)).ti,ab.
626.	((medial or lateral) adj3 (compart* or unicompart* or unicondylar)).ti,ab.
627.	or/22-26
628.	21 and 27
629.	random*.ti,ab.
630.	factorial*.ti,ab.
631.	(crossover* or cross over*).ti,ab.
632.	((doubl* or singl*) adj blind*).ti,ab.
633.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
634.	crossover procedure/
635.	single blind procedure/
636.	randomized controlled trial/
637.	double blind procedure/
638.	or/29-37
639.	systematic review/
640.	meta-analysis/
641.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
642.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
643.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
644.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
645.	(search* adj4 literature).ab.
646.	(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.
647.	cochrane.jw.
648.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
649.	or/39-48
650.	Clinical study/
651.	Observational study/
652.	family study/
653.	longitudinal study/
654.	retrospective study/
655.	prospective study/
656.	cohort analysis/
657.	follow-up/
658.	cohort*.ti,ab.

659.	58 and 59
660.	(cohort adj (study or studies or analys* or data)).ti,ab.
661.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
662.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
663.	(before adj2 after adj2 (study or studies or data)).ti,ab.
664.	or/51-57,60-64
665.	exp case control study/
666.	case control*.ti,ab.
667.	or/66-67
668.	65 or 68
669.	cross-sectional study/
670.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
671.	or/70-71
672.	65 or 72
673.	65 or 68 or 72
674.	28 and (38 or 49 or 73)

Cochrane Library (Wiley) search terms

#234.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#235.	((joint* or knee*) near/3 (replace* or prosth* or endoprosth* or implant* or arthroplast*)):ti,ab
#236.	(OR #1-#2)
#237.	(Total and (partial or unicompart* or unicondylar or compart* or resurf* or re-surf* or patell*)):ti,ab
#238.	(partial and (Total or unicompart* or unicondylar or compart* or resurf* or re-surf* or patell*)):ti,ab
#239.	((unicompart* or unicondylar or compart*) and (Total or partial or resurf* or re-surf* or patell*)):ti,ab
#240.	((resurf* or re-surf* or patell*) and (Total or partial or unicondylar or unicompart* or compart*)):ti,ab
#241.	((medial or lateral) near/3 (compart* or unicompart* or unicondylar)):ti,ab
#242.	(OR #4-#8)
#243.	#3 AND #9

A.16.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 18: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions

Database	Dates searched	Search filter used
		Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

345.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
346.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
347.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
348.	or/1-3
349.	letter/
350.	editorial/
351.	news/
352.	exp historical article/
353.	Anecdotes as Topic/
354.	comment/
355.	case report/
356.	(letter or comment*).ti.
357.	or/5-12
358.	randomized controlled trial/ or random*.ti,ab.
359.	13 not 14
360.	animals/ not humans/
361.	exp Animals, Laboratory/
362.	exp Animal Experimentation/
363.	exp Models, Animal/
364.	exp Rodentia/
365.	(rat or rats or mouse or mice).ti.
366.	or/15-21
367.	4 not 22
368.	limit 23 to English language
369.	Economics/
370.	Value of life/
371.	exp "Costs and Cost Analysis"/
372.	exp Economics, Hospital/
373.	exp Economics, Medical/
374.	Economics, Nursing/
375.	Economics, Pharmaceutical/
376.	exp "Fees and Charges"/
377.	exp Budgets/
378.	budget*.ti,ab.
379.	cost*.ti.

380.	(economic* or pharmaco?economic*).ti.
381.	(price* or pricing*).ti,ab.
382.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
383.	(financ* or fee or fees).ti,ab.
384.	(value adj2 (money or monetary)).ti,ab.
385.	or/25-40
386.	24 and 41

Embase (Ovid) search terms

305.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
306.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
307.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
308.	or/1-3
309.	letter.pt. or letter/
310.	note.pt.
311.	editorial.pt.
312.	case report/ or case study/
313.	(letter or comment*).ti.
314.	or/5-9
315.	randomized controlled trial/ or random*.ti,ab.
316.	10 not 11
317.	animal/ not human/
318.	nonhuman/
319.	exp Animal Experiment/
320.	exp Experimental Animal/
321.	animal model/
322.	exp Rodent/
323.	(rat or rats or mouse or mice).ti.
324.	or/12-19
325.	4 not 20
326.	limit 21 to English language
327.	health economics/
328.	exp economic evaluation/
329.	exp health care cost/
330.	exp fee/
331.	budget/
332.	funding/
333.	budget*.ti,ab.
334.	cost*.ti.
335.	(economic* or pharmaco?economic*).ti.

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336.	(price* or pricing*).ti,ab.
337.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
338.	(financ* or fee or fees).ti,ab.
339.	(value adj2 (money or monetary)).ti,ab.
340.	or/23-35
341.	22 and 36

NHS EED and HTA (CRD) search terms

#105.	MeSH DESCRIPTOR arthroplasty
#106.	MeSH DESCRIPTOR arthroplasty, replacement
#107.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#108.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#109.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#110.	MeSH DESCRIPTOR hemiarthroplasty
#111.	MeSH DESCRIPTOR joint prosthesis
#112.	MeSH DESCRIPTOR hip prosthesis
#113.	MeSH DESCRIPTOR knee prosthesis
#114.	MeSH DESCRIPTOR shoulder prosthesis
#115.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*))
#116.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#117.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

Joint replacement search strategy 10

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.17 Surgical approaches for hip replacement surgery

A.17.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 19: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12	None

Medline (Ovid) search terms

653.	Arthroplasty, Replacement, Hip/
654.	Hip Prosthesis/
655.	((joint* or hip*) adj3 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
656.	1 or 3
657.	letter/
658.	editorial/
659.	news/
660.	exp historical article/
661.	Anecdotes as Topic/
662.	comment/
663.	case report/
664.	(letter or comment*).ti.
665.	or/5-12
666.	randomized controlled trial/ or random*.ti,ab.
667.	13 not 14
668.	animals/ not humans/
669.	exp Animals, Laboratory/

670.	exp Animal Experimentation/
671.	exp Models, Animal/
672.	exp Rodentia/
673.	(rat or rats or mouse or mice).ti.
674.	or/15-21
675.	4 not 22
676.	limit 23 to English language
677.	((surgery or surgical or hip) adj4 approach*).ti,ab.
678.	(direct adj2 (anterior or superior)).ti,ab.
679.	(smithpeters?n or smith-peters?n).ti,ab.
680.	(anterolateral* or watson-jones).ti,ab.
681.	(posterior or moore or southern).ti,ab.
682.	(supercapsular or percutaneously or superpath or path).ti,ab.
683.	or/25-30
684.	24 and 31
685.	randomized controlled trial.pt.
686.	controlled clinical trial.pt.
687.	randomi#ed.ti,ab.
688.	placebo.ab.
689.	randomly.ti,ab.
690.	Clinical Trials as topic.sh.
691.	trial.ti.
692.	or/33-39
693.	Meta-Analysis/
694.	exp Meta-Analysis as Topic/
695.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
696.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
697.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
698.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
699.	(search* adj4 literature).ab.
700.	(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.
701.	cochrane.jw.
702.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
703.	or/41-50
704.	Epidemiologic studies/
705.	Observational study/
706.	exp Cohort studies/
707.	(cohort adj (study or studies or analys* or data)).ti,ab.
708.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
709.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
710.	Controlled Before-After Studies/
711.	Historically Controlled Study/

712.	Interrupted Time Series Analysis/
713.	(before adj2 after adj2 (study or studies or data)).ti,ab.
714.	or/53-62
715.	exp case control study/
716.	case control*.ti,ab.
717.	or/64-65
718.	63 or 66
719.	Cross-sectional studies/
720.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
721.	or/68-69
722.	63 or 70
723.	63 or 66 or 70
724.	32 and (40 or 51 or 71)

Embase (Ovid) search terms

675.	hip replacement/ or hip arthroplasty/
676.	Hip Prosthesis/
677.	((joint* or hip*) adj3 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
678.	or/1-3
679.	letter.pt. or letter/
680.	note.pt.
681.	editorial.pt.
682.	case report/ or case study/
683.	(letter or comment*).ti.
684.	or/5-9
685.	randomized controlled trial/ or random*.ti,ab.
686.	10 not 11
687.	animal/ not human/
688.	nonhuman/
689.	exp Animal Experiment/
690.	exp Experimental Animal/
691.	animal model/
692.	exp Rodent/
693.	(rat or rats or mouse or mice).ti.
694.	or/12-19
695.	4 not 20
696.	limit 21 to English language
697.	((surgery or surgical or hip) adj4 approach*).ti,ab.
698.	(direct adj2 (anterior or superior)).ti,ab.
699.	(smithpeters?n or smith-peters?n).ti,ab.
700.	(anterolateral* or watson-jones).ti,ab.
701.	(posterior or moore or southern).ti,ab.
702.	(supercapsular or percutaneously or superpath or path).ti,ab.
703.	or/23-28
704.	22 and 29

705.	random*.ti,ab.
706.	factorial*.ti,ab.
707.	(crossover* or cross over*).ti,ab.
708.	((doubl* or singl*) adj blind*).ti,ab.
709.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
710.	crossover procedure/
711.	single blind procedure/
712.	randomized controlled trial/
713.	double blind procedure/
714.	or/31-39
715.	systematic review/
716.	meta-analysis/
717.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
718.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
719.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
720.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
721.	(search* adj4 literature).ab.
722.	(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.
723.	cochrane.jw.
724.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
725.	or/41-50
726.	Clinical study/
727.	Observational study/
728.	family study/
729.	longitudinal study/
730.	retrospective study/
731.	prospective study/
732.	cohort analysis/
733.	follow-up/
734.	cohort*.ti,ab.
735.	60 and 61
736.	(cohort adj (study or studies or analys* or data)).ti,ab.
737.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
738.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
739.	(before adj2 after adj2 (study or studies or data)).ti,ab.
740.	or/53-59,62-66
741.	exp case control study/
742.	case control*.ti,ab.
743.	or/68-69
744.	67 or 70
745.	cross-sectional study/
746.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.

747.	or/72-73
748.	67 or 74
749.	67 or 70 or 74
750.	30 and (40 or 51 or 75)

Cochrane Library (Wiley) search terms

#244.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#245.	MeSH descriptor: [Hip Prosthesis] this term only
#246.	((joint* or hip*) near/3 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#247.	(OR #1-#3)
#248.	((surgery or surgical or hip) near/4 approach*):ti,ab
#249.	(direct near/2 (anterior or superior)):ti,ab
#250.	(smithpetersen or smithpeterson or smith-petersen or smith-peterson):ti,ab
#251.	(anterolateral* or watson-jones):ti,ab
#252.	(posterior or moore or southern):ti,ab
#253.	(supercapsular or percutaneously or superpath or path):ti,ab
#254.	(OR #5-#10)
#255.	#4 AND #11

A.17.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run on Medline and Embase.

Table 20: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

387.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
388.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
389.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab.
390.	or/1-3

391.	letter/
392.	editorial/
393.	news/
394.	exp historical article/
395.	Anecdotes as Topic/
396.	comment/
397.	case report/
398.	(letter or comment*).ti.
399.	or/5-12
400.	randomized controlled trial/ or random*.ti,ab.
401.	13 not 14
402.	animals/ not humans/
403.	exp Animals, Laboratory/
404.	exp Animal Experimentation/
405.	exp Models, Animal/
406.	exp Rodentia/
407.	(rat or rats or mouse or mice).ti.
408.	or/15-21
409.	4 not 22
410.	limit 23 to English language
411.	Economics/
412.	Value of life/
413.	exp "Costs and Cost Analysis"/
414.	exp Economics, Hospital/
415.	exp Economics, Medical/
416.	Economics, Nursing/
417.	Economics, Pharmaceutical/
418.	exp "Fees and Charges"/
419.	exp Budgets/
420.	budget*.ti,ab.
421.	cost*.ti.
422.	(economic* or pharmaco?economic*).ti.
423.	(price* or pricing*).ti,ab.
424.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)),ab.
425.	(financ* or fee or fees).ti,ab.
426.	(value adj2 (money or monetary)).ti,ab.
427.	or/25-40
428.	24 and 41

Embase (Ovid) search terms

342.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
343.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
344.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)),ti,ab.

345.	or/1-3
346.	letter.pt. or letter/
347.	note.pt.
348.	editorial.pt.
349.	case report/ or case study/
350.	(letter or comment*).ti.
351.	or/5-9
352.	randomized controlled trial/ or random*.ti,ab.
353.	10 not 11
354.	animal/ not human/
355.	nonhuman/
356.	exp Animal Experiment/
357.	exp Experimental Animal/
358.	animal model/
359.	exp Rodent/
360.	(rat or rats or mouse or mice).ti.
361.	or/12-19
362.	4 not 20
363.	limit 21 to English language
364.	health economics/
365.	exp economic evaluation/
366.	exp health care cost/
367.	exp fee/
368.	budget/
369.	funding/
370.	budget*.ti,ab.
371.	cost*.ti.
372.	(economic* or pharmaco?economic*).ti.
373.	(price* or pricing*).ti,ab.
374.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
375.	(financ* or fee or fees).ti,ab.
376.	(value adj2 (money or monetary)).ti,ab.
377.	or/23-35
378.	22 and 36

NHS EED and HTA (CRD) search terms

#118.	MeSH DESCRIPTOR arthroplasty
#119.	MeSH DESCRIPTOR arthroplasty, replacement
#120.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#121.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#122.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#123.	MeSH DESCRIPTOR hemiarthroplasty

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#124.	MeSH DESCRIPTOR joint prosthesis
#125.	MeSH DESCRIPTOR hip prosthesis
#126.	MeSH DESCRIPTOR knee prosthesis
#127.	MeSH DESCRIPTOR shoulder prosthesis
#128.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*))
#129.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#130.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

Joint replacement search strategy 11

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.18 Humeral hemiarthroplasty versus conventional total shoulder arthroplasty versus reverse total shoulder arthroplasty for osteoarthritis with an intact rotator cuff review

A.19 Shoulder arthroplasty after previous proximal humeral fracture

A.19.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Due to the size of retrieval, only the population was used in this search.

Table 21: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12	None

Medline (Ovid) search terms

725.	arthroplasty, replacement, shoulder/
726.	shoulder prosthesis/
727.	(shoulder* adj4 (replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast* or reverse)).ti,ab.
728.	or/1-3
729.	letter/
730.	editorial/
731.	news/
732.	exp historical article/
733.	Anecdotes as Topic/

734.	comment/
735.	case report/
736.	(letter or comment*).ti.
737.	or/5-12
738.	randomized controlled trial/ or random*.ti,ab.
739.	13 not 14
740.	animals/ not humans/
741.	exp Animals, Laboratory/
742.	exp Animal Experimentation/
743.	exp Models, Animal/
744.	exp Rodentia/
745.	(rat or rats or mouse or mice).ti.
746.	or/15-21
747.	4 not 22
748.	limit 23 to English language
749.	randomized controlled trial.pt.
750.	controlled clinical trial.pt.
751.	randomi#ed.ti,ab.
752.	placebo.ab.
753.	randomly.ti,ab.
754.	Clinical Trials as topic.sh.
755.	trial.ti.
756.	or/25-31
757.	Meta-Analysis/
758.	exp Meta-Analysis as Topic/
759.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
760.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
761.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
762.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
763.	(search* adj4 literature).ab.
764.	(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.
765.	cochrane.jw.
766.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
767.	or/33-42
768.	Epidemiologic studies/
769.	Observational study/
770.	exp Cohort studies/
771.	(cohort adj (study or studies or analys* or data)).ti,ab.
772.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
773.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
774.	Controlled Before-After Studies/
775.	Historically Controlled Study/

776.	Interrupted Time Series Analysis/
777.	(before adj2 after adj2 (study or studies or data)).ti,ab.
778.	or/45-54
779.	exp case control study/
780.	case control*.ti,ab.
781.	or/56-57
782.	55 or 58
783.	Cross-sectional studies/
784.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
785.	or/60-61
786.	55 or 62
787.	55 or 58 or 62
788.	24 and (32 or 43 or 63)

Embase (Ovid) search terms

751.	shoulder replacement/
752.	shoulder prosthesis/
753.	(shoulder* adj4 (replac* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast* or reverse)).ti,ab.
754.	or/1-3
755.	letter.pt. or letter/
756.	note.pt.
757.	editorial.pt.
758.	case report/ or case study/
759.	(letter or comment*).ti.
760.	or/5-9
761.	randomized controlled trial/ or random*.ti,ab.
762.	10 not 11
763.	animal/ not human/
764.	nonhuman/
765.	exp Animal Experiment/
766.	exp Experimental Animal/
767.	animal model/
768.	exp Rodent/
769.	(rat or rats or mouse or mice).ti.
770.	or/12-19
771.	4 not 20
772.	limit 21 to English language
773.	random*.ti,ab.
774.	factorial*.ti,ab.
775.	(crossover* or cross over*).ti,ab.
776.	((doubl* or singl*) adj blind*).ti,ab.
777.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
778.	crossover procedure/
779.	single blind procedure/
780.	randomized controlled trial/

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781.	double blind procedure/
782.	or/23-31
783.	systematic review/
784.	meta-analysis/
785.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
786.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
787.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
788.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
789.	(search* adj4 literature).ab.
790.	(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.
791.	cochrane.jw.
792.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
793.	or/33-42
794.	Clinical study/
795.	Observational study/
796.	family study/
797.	longitudinal study/
798.	retrospective study/
799.	prospective study/
800.	cohort analysis/
801.	follow-up/
802.	cohort*.ti,ab.
803.	52 and 53
804.	(cohort adj (study or studies or analys* or data)).ti,ab.
805.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
806.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
807.	(before adj2 after adj2 (study or studies or data)).ti,ab.
808.	or/45-51,54-58
809.	exp case control study/
810.	case control*.ti,ab.
811.	or/60-61
812.	59 or 62
813.	cross-sectional study/
814.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
815.	or/64-65
816.	59 or 66
817.	59 or 62 or 66
818.	22 and (32 or 43 or 67)

Cochrane Library (Wiley) search terms

#256.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#257.	MeSH descriptor: [Shoulder Prosthesis] this term only

#258.	(shoulder* near/4 (replac* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast* or reverse)):ti,ab
#259.	(OR #1-#3)

A.19.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to the joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 22: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

429.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
430.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
431.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab.
432.	or/1-3
433.	letter/
434.	editorial/
435.	news/
436.	exp historical article/
437.	Anecdotes as Topic/
438.	comment/
439.	case report/
440.	(letter or comment*).ti.
441.	or/5-12
442.	randomized controlled trial/ or random*.ti,ab.
443.	13 not 14
444.	animals/ not humans/
445.	exp Animals, Laboratory/
446.	exp Animal Experimentation/
447.	exp Models, Animal/

448.	exp Rodentia/
449.	(rat or rats or mouse or mice).ti.
450.	or/15-21
451.	4 not 22
452.	limit 23 to English language
453.	Economics/
454.	Value of life/
455.	exp "Costs and Cost Analysis"/
456.	exp Economics, Hospital/
457.	exp Economics, Medical/
458.	Economics, Nursing/
459.	Economics, Pharmaceutical/
460.	exp "Fees and Charges"/
461.	exp Budgets/
462.	budget*.ti,ab.
463.	cost*.ti.
464.	(economic* or pharmaco?economic*).ti.
465.	(price* or pricing*).ti,ab.
466.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
467.	(financ* or fee or fees).ti,ab.
468.	(value adj2 (money or monetary)).ti,ab.
469.	or/25-40
470.	24 and 41

Embase (Ovid) search terms

379.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
380.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
381.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
382.	or/1-3
383.	letter.pt. or letter/
384.	note.pt.
385.	editorial.pt.
386.	case report/ or case study/
387.	(letter or comment*).ti.
388.	or/5-9
389.	randomized controlled trial/ or random*.ti,ab.
390.	10 not 11
391.	animal/ not human/
392.	nonhuman/
393.	exp Animal Experiment/
394.	exp Experimental Animal/
395.	animal model/

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396.	exp Rodent/
397.	(rat or rats or mouse or mice).ti.
398.	or/12-19
399.	4 not 20
400.	limit 21 to English language
401.	health economics/
402.	exp economic evaluation/
403.	exp health care cost/
404.	exp fee/
405.	budget/
406.	funding/
407.	budget*.ti,ab.
408.	cost*.ti.
409.	(economic* or pharmaco?economic*).ti.
410.	(price* or pricing*).ti,ab.
411.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
412.	(financ* or fee or fees).ti,ab.
413.	(value adj2 (money or monetary)).ti,ab.
414.	or/23-35
415.	22 and 36

NHS EED and HTA (CRD) search terms

#131.	MeSH DESCRIPTOR arthroplasty
#132.	MeSH DESCRIPTOR arthroplasty, replacement
#133.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#134.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#135.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#136.	MeSH DESCRIPTOR hemiarthroplasty
#137.	MeSH DESCRIPTOR joint prosthesis
#138.	MeSH DESCRIPTOR hip prosthesis
#139.	MeSH DESCRIPTOR knee prosthesis
#140.	MeSH DESCRIPTOR shoulder prosthesis
#141.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoproshe* or implant* or artificial or arthroplast* or hemiarthroplast*))
#142.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#143.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA

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Joint replacement search strategy 12

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual 2014.{NICE2014}

For more detailed information, please see the Methodology Review. [\[Add cross reference\]](#)

A.20 Long-term follow-up and monitoring

A.20.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies for interventions as these concepts may not be well described in title, abstract or indexes and therefore difficult to retrieve. Search filters were applied to the searches where appropriate.

Table 23: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
Embase (OVID)	1974 – 01 May 2019	Exclusions Randomised controlled trials Systematic review studies Observational studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2019 Issue 5 of 12 CENTRAL to 2019 Issue 5 of 12	None

Medline (Ovid) search terms

789.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
790.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
791.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endopros* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
792.	or/1-3
793.	letter/
794.	editorial/
795.	news/
796.	exp historical article/
797.	Anecdotes as Topic/
798.	comment/
799.	case report/
800.	(letter or comment*).ti.
801.	or/5-12
802.	randomized controlled trial/ or random*.ti,ab.
803.	13 not 14

804.	animals/ not humans/
805.	exp Animals, Laboratory/
806.	exp Animal Experimentation/
807.	exp Models, Animal/
808.	exp Rodentia/
809.	(rat or rats or mouse or mice).ti.
810.	or/15-21
811.	4 not 22
812.	limit 23 to English language
813.	Monitoring, physiologic/
814.	(monitoring or followup or follow up or surveillance).ti.
815.	((followup or follow* up or surveillance or monitor*) adj2 (strateg* or program* or regular* or routine* or periodic* or schedul* or frequen* or timing or long term or longterm or services)).ti,ab.
816.	((followup or follow* up or surveillance or monitoring) adj2 (specialist* or physician* or nurse* or surgeon* or general practi* or GP or family practi* or doctor or orthopaedic or physiotherapist*)).ti,ab.
817.	((followup or follow* up or surveillance or monitoring) adj2 (x-ray* or xray* or x-radiation* or xradiation* or roentgen ray* or radiograph*)).ti,ab.
818.	or/25-29
819.	24 and 30
820.	randomized controlled trial.pt.
821.	controlled clinical trial.pt.
822.	randomi#ed.ti,ab.
823.	placebo.ab.
824.	randomly.ti,ab.
825.	Clinical Trials as topic.sh.
826.	trial.ti.
827.	or/32-38
828.	Meta-Analysis/
829.	exp Meta-Analysis as Topic/
830.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
831.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
832.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
833.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
834.	(search* adj4 literature).ab.
835.	(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.
836.	cochrane.jw.
837.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
838.	or/40-49
839.	Epidemiologic studies/
840.	Observational study/
841.	exp Cohort studies/
842.	(cohort adj (study or studies or analys* or data)).ti,ab.

843.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
844.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
845.	Controlled Before-After Studies/
846.	Historically Controlled Study/
847.	Interrupted Time Series Analysis/
848.	(before adj2 after adj2 (study or studies or data)).ti,ab.
849.	or/51-60
850.	exp case control study/
851.	case control*.ti,ab.
852.	or/62-63
853.	61 or 64
854.	Cross-sectional studies/
855.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
856.	or/66-67
857.	61 or 68
858.	61 or 64 or 68
859.	31 and (39 or 50 or 70)

Embase (Ovid) search terms

819.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
820.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
821.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
822.	or/1-3
823.	letter.pt. or letter/
824.	note.pt.
825.	editorial.pt.
826.	case report/ or case study/
827.	(letter or comment*).ti.
828.	or/5-9
829.	randomized controlled trial/ or random*.ti,ab.
830.	10 not 11
831.	animal/ not human/
832.	nonhuman/
833.	exp Animal Experiment/
834.	exp Experimental Animal/
835.	animal model/
836.	exp Rodent/
837.	(rat or rats or mouse or mice).ti.
838.	or/12-19
839.	4 not 20
840.	limit 21 to English language
841.	patient monitoring/
842.	(monitoring or followup or follow up or surveillance).ti.

843.	((followup or follow* up or surveillance or monitor*) adj2 (strateg* or program* or regular* or routine* or periodic* or schedul* or frequen* or timing or long term or longterm or services)).ti,ab.
844.	((followup or follow* up or surveillance or monitoring) adj2 (specialist* or physician* or nurse* or surgeon* or general practi* or GP or family practi* or doctor or orthopaedic or physiotherapist*)).ti,ab.
845.	((followup or follow* up or surveillance or monitoring) adj2 (x-ray* or xray* or x-radiation* or xradiation* or roentgen ray* or radiograph*)).ti,ab.
846.	or/23-27
847.	22 and 28
848.	random*.ti,ab.
849.	factorial*.ti,ab.
850.	(crossover* or cross over*).ti,ab.
851.	((doubl* or singl*) adj blind*).ti,ab.
852.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
853.	crossover procedure/
854.	single blind procedure/
855.	randomized controlled trial/
856.	double blind procedure/
857.	or/30-38
858.	systematic review/
859.	meta-analysis/
860.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
861.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
862.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
863.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
864.	(search* adj4 literature).ab.
865.	(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.
866.	cochrane.jw.
867.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
868.	or/40-49
869.	Clinical study/
870.	Observational study/
871.	family study/
872.	longitudinal study/
873.	retrospective study/
874.	prospective study/
875.	cohort analysis/
876.	follow-up/
877.	cohort*.ti,ab.
878.	58 and 59
879.	(cohort adj (study or studies or analys* or data)).ti,ab.
880.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
881.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or

	review or analys* or cohort* or data)).ti,ab.
882.	(before adj2 after adj2 (study or studies or data)).ti,ab.
883.	or/51-57,60-64
884.	exp case control study/
885.	case control*.ti,ab.
886.	or/66-67
887.	65 or 68
888.	cross-sectional study/
889.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
890.	or/70-71
891.	65 or 72
892.	65 or 68 or 72
893.	29 and (39 or 50 or 74)

Cochrane Library (Wiley) search terms

#260.	MeSH descriptor: [Arthroplasty] this term only
#261.	MeSH descriptor: [Arthroplasty, Replacement] this term only
#262.	MeSH descriptor: [Arthroplasty, Replacement, Hip] this term only
#263.	MeSH descriptor: [Arthroplasty, Replacement, Knee] this term only
#264.	MeSH descriptor: [Arthroplasty, Replacement, Shoulder] this term only
#265.	MeSH descriptor: [Hemiarthroplasty] this term only
#266.	(or #1-#6)
#267.	MeSH descriptor: [Joint Prosthesis] this term only
#268.	MeSH descriptor: [Hip Prosthesis] this term only
#269.	MeSH descriptor: [Knee Prosthesis] this term only
#270.	MeSH descriptor: [Shoulder Prosthesis] this term only
#271.	(or #8-#11)
#272.	((joint* or knee* or shoulder* or hip*) near/5 (surger* or replace* or prosthe* or endoprothe* or implant* or artificial or arthroplast* or hemiarthroplast*)):ti,ab
#273.	(or #7, #12-#13)
#274.	MeSH descriptor: [Monitoring, Physiologic] this term only
#275.	(monitoring or followup or follow up or surveillance):ti
#276.	((followup or follow* up or surveillance or monitor*) near/2 (strateg* or program* or regular* or routine* or periodic* or schedul* or frequen* or timing or long term or longterm or services)):ti,ab
#277.	((followup or follow* up or surveillance or monitoring) near/2 (specialist* or physician* or nurse* or surgeon* or general practi* or GP or family practi* or doctor or orthopaedic or physiotherapist*)):ti,ab
#278.	((followup or follow* up or surveillance or monitoring) near/2 (x-ray* or xray* or x-radiation* or xradiation* or roentgen ray* or radiograph*)):ti,ab
#279.	(OR #15-#19)
#280.	#14 AND #20

A.20.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to joint replacement population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research

and Dissemination (CRD). Additional health economics searches were run in Medline and Embase.

Table 34: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 01 May 2019	Exclusions Health economics studies
Embase	2014 – 01 May 2019	Exclusions Health economics studies
Centre for Research and Dissemination (CRD)	HTA - Inception – 01 May 2019 NHSEED - Inception to March 2015	None

Medline (Ovid) search terms

471.	arthroplasty/ or arthroplasty, replacement/ or arthroplasty, replacement, hip/ or arthroplasty, replacement, knee/ or arthroplasty, replacement, shoulder/ or hemiarthroplasty/
472.	joint prosthesis/ or hip prosthesis/ or knee prosthesis/ or shoulder prosthesis/
473.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosth* or endoprosth* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
474.	or/1-3
475.	letter/
476.	editorial/
477.	news/
478.	exp historical article/
479.	Anecdotes as Topic/
480.	comment/
481.	case report/
482.	(letter or comment*).ti.
483.	or/5-12
484.	randomized controlled trial/ or random*.ti,ab.
485.	13 not 14
486.	animals/ not humans/
487.	exp Animals, Laboratory/
488.	exp Animal Experimentation/
489.	exp Models, Animal/
490.	exp Rodentia/
491.	(rat or rats or mouse or mice).ti.
492.	or/15-21
493.	4 not 22
494.	limit 23 to English language
495.	Economics/
496.	Value of life/
497.	exp "Costs and Cost Analysis"/
498.	exp Economics, Hospital/
499.	exp Economics, Medical/

500.	Economics, Nursing/
501.	Economics, Pharmaceutical/
502.	exp "Fees and Charges"/
503.	exp Budgets/
504.	budget*.ti,ab.
505.	cost*.ti.
506.	(economic* or pharmaco?economic*).ti.
507.	(price* or pricing*).ti,ab.
508.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
509.	(financ* or fee or fees).ti,ab.
510.	(value adj2 (money or monetary)).ti,ab.
511.	or/25-40
512.	24 and 41

Embase (Ovid) search terms

416.	*arthroplasty/ or *replacement arthroplasty/ or *hip replacement/ or *knee replacement/ or *shoulder replacement/ or *hemiarthroplasty/
417.	*joint prosthesis/ or *hip prosthesis/ or *knee prosthesis/ or *shoulder prosthesis/
418.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoprosthe* or implant* or artificial or arthroplast* or hemiarthroplast*)).ti,ab.
419.	or/1-3
420.	letter.pt. or letter/
421.	note.pt.
422.	editorial.pt.
423.	case report/ or case study/
424.	(letter or comment*).ti.
425.	or/5-9
426.	randomized controlled trial/ or random*.ti,ab.
427.	10 not 11
428.	animal/ not human/
429.	nonhuman/
430.	exp Animal Experiment/
431.	exp Experimental Animal/
432.	animal model/
433.	exp Rodent/
434.	(rat or rats or mouse or mice).ti.
435.	or/12-19
436.	4 not 20
437.	limit 21 to English language
438.	health economics/
439.	exp economic evaluation/
440.	exp health care cost/
441.	exp fee/

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442.	budget/
443.	funding/
444.	budget*.ti,ab.
445.	cost*.ti.
446.	(economic* or pharmaco?economic*).ti.
447.	(price* or pricing*).ti,ab.
448.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
449.	(financ* or fee or fees).ti,ab.
450.	(value adj2 (money or monetary)).ti,ab.
451.	or/23-35
452.	22 and 36

NHS EED and HTA (CRD) search terms

#144.	MeSH DESCRIPTOR arthroplasty
#145.	MeSH DESCRIPTOR arthroplasty, replacement
#146.	MeSH DESCRIPTOR arthroplasty, replacement, hip
#147.	MeSH DESCRIPTOR arthroplasty, replacement, knee
#148.	MeSH DESCRIPTOR arthroplasty, replacement, shoulder
#149.	MeSH DESCRIPTOR hemiarthroplasty
#150.	MeSH DESCRIPTOR joint prosthesis
#151.	MeSH DESCRIPTOR hip prosthesis
#152.	MeSH DESCRIPTOR knee prosthesis
#153.	MeSH DESCRIPTOR shoulder prosthesis
#154.	((joint* or knee* or shoulder* or hip*) adj5 (surger* or replace* or prosthe* or endoproshe* or implant* or artificial or arthroplast* or hemiarthroplast*))
#155.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN NHSEED
#156.	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11) IN HTA