National Institute for Health and Care Excellence

Draft for consultation

Osteoarthritis: assessment and management (update)

[L] Evidence reviews for regular follow up and review

NICE guideline <number>

Evidence reviews underpinning recommendations 1.5.1 to 1.5.3 and research recommendations in the NICE guideline

April 2022

Draft for Consultation

Disclaimer

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

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ISBN:

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1 Follow-up and review

1.1 Review question

Is regular follow-up and review needed for people with osteoarthritis?

1.1.1 Introduction

Primary care is the most common first point of contact for people with osteoarthritis. Although some people may re-present to primary care over many years, some only present once and others never present. Patients with osteoarthritis may be prescribed potentially harmful medication or may have declining function, in which cases, timely review, intervention and reconsideration of the management plan would be beneficial. Adherence to management approaches such as exercise may be improved through follow-up. These issues have led to calls for regular, standardised reviews. However, the symptoms and function of people with osteoarthritis may vary from joint-to-joint and from person-to-person over time, this can necessitate frequent reviews over a short period of time. In such cases, a routine follow-up when the patient's symptoms have settled may represent an unnecessary use of resource. It is important to have an effective system for achieving the best outcomes for people with osteoarthritis through balancing a proactive and a reactive approach to follow-up.

Current practice for people with osteoarthritis is to have symptom-led reviews and proactive medication reviews. Follow up is limited within NHS physiotherapy services and there can be long waiting times for specialist chronic pain services. There is not a standardised approach for follow up of a patient with osteoarthritis over time.

This review aims to determine if regular follow-up and review is beneficial for people with osteoarthritis. This question aims to answer:

A) Is regular or symptom-led follow-up most beneficial?

B) If regular follow-up is beneficial, what is the frequency of follow up that is required (for example: more than once a year compared to once a year)?

1.1.2 Summary of the protocol

Table 1: PICO characteristics of review question

Population	Inclusion: • Adults (age ≥16 years) with osteoarthritis affecting any joint Stratification of the population: 1 – People starting a new pharmacological intervention 2 – People starting a new non-pharmacological intervention 3 – Long-term condition management (defined as: people requiring additional management who are not necessarily starting a new pharmacological or non-pharmacological intervention, including people who may be eligible for joint replacement surgery and people who do not want joint replacement surgery but have symptoms that require management). Exclusion: • Children (age <16 years) • People with conditions that may make them susceptible to osteoarthritis or often occur alongside osteoarthritis (including: crystal arthritis, inflammatory

	arthritis, septic arthritis, diseases of childhood that may predispose to osteoarthritis, medical conditions presenting with joint inflammation and malignancy). • Spinal osteoarthritis

Interventions	A) Is regular or symptom-led follow-up most beneficial?
	• Structured, regular follow up appointments dedicated to the topic of osteoarthritis (in a United Kingdom primary care setting or relevant equivalent setting in other countries) at a specified frequency.
	• Symptom led follow-up
	  ○ Pain led follow-up
	  ○ Function led follow-up
	
	B) If regular follow-up is beneficial what is the frequency of follow-up required?
	Frequency will be categorised into the following groups:
	• More than once a year
	• Once a year
	• Between six months and once a year
	• Less than six months

Comparisons	Compared to each other (including regular follow up compared to symptom led follow up [split by two categories] and different frequencies of follow up) Confounding factors (if including non-randomised evidence): • Age • Baseline symptoms such as pain and/or function • Baseline BMI (or weight in the absence of BMI)
Outcomes	Stratify by ≤/>3 months (longest time-point in each): Critical outcomes: • Health-related quality of life [validated patient-reported outcomes, continuous data prioritised] • Pain [validated patient-reported outcomes, continuous data prioritised] • Physical function [validated patient-reported outcomes, continuous data prioritised] Important outcomes: • Psychological distress [validated patient-reported outcomes, continuous data prioritised] • Osteoarthritis flares [validated patient-reported outcomes, continuous data prioritised] • Falls [dichotomous] • Residential service or hospital admission (including disability allowance) [dichotomous] • Progression to joint replacement [dichotomous]
Study design	• Systematic reviews of randomised controlled trials (RCTs) • RCTs If insufficient RCT evidence is available, non-randomised studies will be considered, including: 1. Prospective and retrospective cohort studies Studies will only be included if all of the key confounders have been accounted for in a multivariate analysis. In the absence of multivariate analysis, studies that

	account for key confounders with univariate analysis or matched groups will be considered.

For full details see the review protocol in Appendix A.

1.1.3 Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in Appendix A and the methods document.

Declarations of interest were recorded according to NICE's conflicts of interest policy.

1.1.4 Effectiveness evidence

1.1.4.1 Included studies

No relevant clinical studies comparing different follow up and review strategies were identified.

See also the study selection flow chart in Appendix C.

1.1.4.2 Excluded studies

See the excluded studies list in Appendix J.

1.1.5 Summary of studies included in the effectiveness evidence

No evidence was identified for this review.

1.1.6 Summary of the effectiveness evidence

No evidence was identified for this review.

1.1.7 Economic evidence

1.1.7.1 Included studies

No health economic studies were included.

1.1.7.2 Excluded studies

No relevant health economic studies were excluded due to assessment of limited applicability or methodological limitations.

See also the health economic study selection flow chart in Appendix G.

1.1.8 Summary of included economic evidence

There was no economic evidence found.

1.1.9 Economic model

This area was not prioritised for new cost-effectiveness analysis.

1.1.10 Unit costs

Relevant unit costs are provided below to aid consideration of cost effectiveness.

Resource	Unit costs	Source
GP cost per consultation lasting 9.22 minutes (including direct care staff costs and qualification costs)	£39	PSSRU 2020[2]

1.1.11 Economic evidence statements

Economic

- No relevant economic evaluations were identified.

1.1.12 The committee's discussion and interpretation of the evidence

1.1.12.1. The outcomes that matter most

The critical outcomes were quality of life, pain and physical function. These were considered critical due to their importance to people with osteoarthritis. The Osteoarthritis Research Society International (OARSI) consider that pain and physical function were the most important outcomes for evaluating interventions. Quality of life gives a broader perspective on the person's wellbeing, allowing for examination of the biopsychosocial impact of interventions. Psychological distress, osteoarthritis flares, falls, residential service or hospital admission (including disability allowance use) and progression to joint replacement were the important outcomes.

The committee considered osteoarthritis flares to be important in the lived experience and management of osteoarthritis. However, these were also considered difficult to measure with no clear consensus on their definition. The Flares in OA OMERACT working group have proposed an initial definition and domains of OA flares through a consensus exercise; "it is a transient state, different from the usual state of the condition, with a duration of a few days, characterized by onset, worsening of pain, swelling, stiffness, impact on sleep, activity, functioning, and psychological aspects that can resolve spontaneously or lead to a need to adjust therapy.". However, this has been considered to have limitations and has not been widely adopted. Therefore, the committee included the outcome accepting any reasonable definition provided by any studies discussing the event.

Mortality was considered as a composite of serious adverse events rather than as a discreet outcome and categorised as an important outcome. Osteoarthritis as a disease process is not considered to cause mortality by itself and mortality is an uncommon outcome from osteoarthritis interventions.

No evidence was identified for any of these outcomes in this review.

1.1.12.2 The quality of the evidence

No evidence was identified for this review.

1.1.12.3 Committee consideration of advantages and disadvantages

The committee considered the current use of follow up in the NHS referring to their expert opinion. In current practice, follow up would be symptom led follow up or osteoarthritis will be raised as a concern in consultations for other conditions where regular follow up is normal practice. On discussion, the committee agreed that symptom led follow up is likely to be appropriate in most scenarios, as people with osteoarthritis may be able to self-manage their

condition effectively after initial information and guidance is provided to initiate management strategies. They considered the potential opportunity cost that could be generated from regular follow up, which considering the absence of evidence saying that there is benefit from this, reinforced this idea. Based on these factors the committee made recommendation 1.5.1.

However, the committee acknowledged that follow up should be focussed on the person's needs and so symptom led follow up may not always be the only scenario where follow up is required. The committee noted some scenarios where additional follow up may be required:

- If any new medication or other intervention is started – The committee acknowledged that introducing new medication presented potential risks and benefits for the person, and that it was appropriate to review the medication with the person to ensure that it is appropriate for ongoing use. This includes ensuring that medication is only used for the minimal time period as advised in recommendation 1.4.1. Therefore, the committee recommended that additional follow up should be considered in this case. This follow up could be provided by anyone suitably qualified to provide it (for example: pharmacists, general practitioners). Furthermore, the committee acknowledged the need for follow up for any other intervention, including exercise. The committee agreed that providing effective information to manage expectations of the effects of treatment are important (such as acknowledging that people will initially experience discomfort from exercise, but if they persist then symptoms will likely improve). Reinforcing this idea may require additional follow up, allowing opportunities to emphasise positive behaviours and empathise with the challenges associated with the intervention.
- The circumstances affecting the ability of the patient to seek help for themselves – The committee noted that health inequalities exist where people may not be able to engage with their health and so seek help on this basis (for example: people with learning disabilities, or people with communication difficulties). Therefore, this model of follow up should be adjusted to the person's needs to ensure that everyone can engage with their care and access the support they require.
- The severity of the patient's symptoms or functional limitations – People who experience more significant symptoms that are affecting their daily life may require additional consultation to work on management plans which may include complex combinations of therapies and considerations for invasive procedures, such as surgery. The committee wished to ensure this group did not experience an unmet need due to gradual but progressive functional deterioration.

All decisions about follow up should be made according to good practice as a shared decision, incorporating the values of the person with osteoarthritis and any healthcare professionals involved in their care. Additional information and recommendations to support those made in this guidance is available in the NICE guidelines on Shared decision making (NG197) and NICE guidelines on Patient experience in adult NHS services (CG138). Support should be provided in a manner tailored to the individual with their concerns taken into account. With all of this taken into account the committee agreed recommendation 1.5.2.

Furthermore, the committee acknowledged that setting clear times to follow up management strategies, if deemed important in a shared decision, is important. Clearly explaining expectations of what a positive treatment experience is like, and the potential problems that can be experienced, and setting a specific time for people to seek additional help in if the management is not improving their symptoms was agreed to be important. Therefore, the committee made recommendation 1.5.3.

When appointments are made to discuss osteoarthritis, this should be the focus of the appointment. People with osteoarthritis may have other conditions that require consideration. However, people may be experiencing significant problems with their osteoarthritis that could be managed effectively if discussed. Therefore, care should be provided in a holistic manner

The committee discussed the implications of osteoarthritis for patients who have multiple long term conditions and agreed that such individuals were at particular risk of long term deterioration due to polypharmacy, falls and interactions between the long term conditions. They recommended that people should refer to the NICE guidelines on Multimorbidity: clinical assessment and management (NG56) for additional guidance. Based on this the committee agreed recommendation 1.5.2.

1.1.12.4 Cost effectiveness and resource use

There were no published economic evaluations found. In the absence of clinical evidence, cost-effectiveness modelling was not feasible since a model would require good evidence of clinical effectiveness.

The committee used expert opinion to inform the recommendation that symptom-led follow-up is likely to be the most appropriate course of action in most cases, which is a departure from the previous recommendation where regular reviews were offered to all people with symptomatic osteoarthritis and annual reviews considered in people who had persistent/multiple joint problems, comorbidities or were taking regular medication for osteoarthritis. They also acknowledged that follow-up should be focussed on the person's needs so there are some circumstances where additional follow-up may be required, for example if symptoms are very severe or if the person does not have the ability to seek help for themselves. This is a change from the previous guidelines where regular reviews of symptomatic osteoarthritis and annual reviews in people with joint symptoms/pain, co-morbidities or multiple medications were recommended.

The committee's decision to recommend symptom-led follow-up in place of regular reviews is a more efficient use of healthcare resources and may lead to cost-savings. This course of action also ensures that patients continue to receive the current standard of care.

1.1.12.5 Other factors the committee took into account

The committee noted that the osteoarthritis research in general does not appear to represent the diverse population of people with osteoarthritis. They agreed that any further research should be representative of the population, including people from different family backgrounds, and socioeconomic backgrounds, disabled people, and people of different ages and genders. Future work should be done to consider the different experiences of people from diverse communities to ensure that the approach taken can be made equitable for everyone. With this in mind the committee subgrouped their research recommendation by these protected characteristics where appropriate while suggesting that people from each group should be included in the research to ensure that it is applicable to the entire population.

1.1.13 Recommendations supported by this evidence review

This evidence review supports recommendations 1.5.1 to 1.5.3 and the research recommendation on follow up. Other evidence supporting these recommendations can be found in evidence review L.

1.1.14 References

1. Ahn YH. Effects and costs of a community-based self-management support program for Korean medical aid beneficiaries with osteoarthritis: 12-month follow-up. Annals of the Rheumatic Diseases. 2016; 75(Suppl 2):1293

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7. Wang Q, Runhaar J, Kloppenburg M, Boers M, Bijlsma JWJ, Bierma-Zeinstra SMA et al. Diagnosis of early stage knee osteoarthritis based on early clinical course: data from the CHECK cohort. Arthritis Research & Therapy. 2021; 23(1):217

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Appendices

Appendix A – Review protocols

Review protocol for follow-up and review for people with osteoarthritis

ID	Field	Content
0.	PROSPERO registration number	N/A
1.	Review title	Is regular follow-up and review needed for people with osteoarthritis?
2.	Review question	Is regular follow-up and review needed for people with osteoarthritis?
3.	Objective	To determine if regular follow-up and review is beneficial for people with osteoarthritis. This question aims to answer: A) Is regular or symptom-led follow-up most beneficial? B) If regular follow-up is beneficial, what is the frequency of follow up that is required (for example: more than once a year compared to once a year)?
4.	Searches	The following databases (from inception) will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE Searches will be restricted by: • English language • Human studies • Letters and comments are excluded

		Other searches: • Inclusion lists of relevant systematic reviews will be checked by the reviewer. The searches may be re-run 6 weeks before final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies ill be published in the final review. Medline search strategy to be quality assured using the PRESS evidence-based checklist (see methods chapter for full details).
5.	Condition or domain being studied	Osteoarthritis (of any joint) in adults (defined as a clinical diagnosis of osteoarthritis with or without imaging)
6.	Population	Inclusion: • Adults (age ≥16 years) with osteoarthritis affecting any joint Stratification of the population: 1 – People starting a new pharmacological intervention 2 – People starting a new non-pharmacological intervention 3 – Long-term condition management Exclusion: • Children (age <16 years)

		• People with conditions that may make them susceptible to osteoarthritis or often occur alongside osteoarthritis (including: crystal arthritis, inflammatory arthritis, septic arthritis, diseases of childhood that may predispose to osteoarthritis, medical conditions presenting with joint inflammation and malignancy). • Spinal osteoarthritis

7.	Intervention	B) Is regular or symptom-led follow-up most beneficial?
		• Structured, regular follow up appointments dedicated to the topic of osteoarthritis (in a United Kingdom primary care setting or relevant equivalent setting in other countries) at a specified frequency.
		• Symptom led follow-up
		  ○ Pain led follow-up
		  ○ Function led follow-up
		
		B) If regular follow-up is beneficial what is the frequency of follow-up required?
		Frequency will be categorised into the following groups:
		• More than once a year
		• Once a year
		• Between six months and once a year
		• Less than six months

8.	Comparator	Compared to each other (including regular follow up compared to symptom led follow up [split by two categories] and different frequencies of follow up) Confounding factors (if including non-randomised evidence): • Age • Baseline symptoms such as pain and/or function • Baseline BMI (or weight in the absence of BMI)
9.	Types of study to be included	• Systematic reviews of randomised controlled trials (RCTs) • RCTs If insufficient RCT evidence is available, non-randomised studies will be considered, including:

		2. Prospective and retrospective cohort studies Studies will only be included if all of the key confounders have been accounted for in a multivariate analysis. In the absence of multivariate analysis, studies that account for key confounders with univariate analysis or matched groups will be considered.
10.	Other exclusion criteria	• People being followed up regarding an intervention (for example: after an exercise program) • Non-English language studies • Conference abstracts will be excluded as it is expected there will be sufficient full text published studies available.
11.	Context	• The last guideline recommended 'Offer regular reviews to all people with symptomatic osteoarthritis. Agree the timing of the reviews with the person.' This question is being revisited as the last guideline focused on follow-up regarding reinforcing core treatments, our question is looking at whether regular follow-up is better than symptom-led follow-up and specifying how often this should be.
12.	Primary outcomes (critical outcomes)	Stratify by ≤/>3 months (longest time-point in each): • Health-related quality of life [validated patient-reported outcomes, continuous data prioritised] • Pain [validated patient-reported outcomes, continuous data prioritised] • Physical function [validated patient-reported outcomes, continuous data prioritised] The COMET database was searched and several core outcome sets were identified for specific sites of osteoarthritis (including hand, knee and hip). The committee took these into account when defining outcomes: - https://onlinelibrary.wiley.com/doi/full/10.1002/acr.22868 - https://www.ncbi.nlm.nih.gov/pubmed/26136489 - https://www.ncbi.nlm.nih.gov/pubmed/30647185 The committee did not include stiffness or global scores as Delphi discussions by the OMERACT group have found these to not be as important to people with osteoarthritis or clinicians. The outcomes included were universal for all groups allowing for broader comparisons.
13.	Secondary outcomes (important outcomes)	• Psychological distress [validated patient-reported outcomes, continuous data prioritised] • Osteoarthritis flares [validated patient-reported outcomes, continuous data prioritised] • Falls [dichotomous]

		• Residential service or hospital admission (including disability allowance) [dichotomous] • Progression to joint replacement [dichotomous]
14.	Data extraction (selection and coding)	EndNote will be used for reference management, sifting, citations and bibliographies. All references identified by the searches and from other sources will be screened for inclusion. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. EviBASE will be used for data extraction of quantitative studies. A standardised form will be used to extract data from qualitative studies (see Developing NICE guidelines: the manual section 6.4). 10% of all evidence reviews are quality assured by a senior research fellow. This includes checking: • papers were included /excluded appropriately • a sample of the data extractions • correct methods are used to synthesise data • a sample of the risk of bias assessments Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary.
15.	Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual For intervention reviews the following checklists will be used according to the study design being assessed: • Systematic reviews: Risk of Bias in Systematic Reviews (ROBIS) • Randomised Controlled Trial: Cochrane RoB (2.0) • Non randomised study, including cohort studies: Cochrane ROBINS-I

16.	Strategy for data synthesis	• Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5). Fixed-effects (Mantel-Haenszel) techniques will be used to calculate risk ratios for the binary outcomes where possible. Continuous outcomes will be analysed using an inverse variance method for pooling weighted mean differences. • Heterogeneity between studies in the effect measures will be assessed using the I^2 statistic and visual inspection. We will consider an I^2 value great than 50% as indicative of substantial heterogeneity. If significant heterogeneity is identified during meta-analysis then subgroup analysis, using subgroups predefined by the GC, will take place. If this does not explain the heterogeneity, the results will be presented using a random-effects model. • GRADEpro will be used to assess the quality of evidence for each outcome, taking into account individual study quality and the meta-analysis results. The 4 main quality elements (risk of bias, indirectness, inconsistency and imprecision) will be appraised for each outcome. Publication bias is tested for when there are more than 5 studies for an outcome. The risk of bias across all available evidence was evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ • Where meta-analysis is not possible, data will be presented and quality assessed individually per outcome. • WinBUGS will be used for network meta-analysis, if possible given the data identified.	
17.	Analysis of sub-groups	• Age (≤/> 75 years) • BMI (underweight, normal weight, overweight)	
18.	Type and method of review	☒	Intervention
		☐	Diagnostic
		☐	Prognostic
		☐	Qualitative
		☐	Epidemiologic

		☐	Service Delivery
		☐	Other (please specify)
19.	Language	English	
20.	Country	England	
21.	Anticipated or actual start date	23/08/2019	
22.	Anticipated completion date	25/08/2021	
23.	Stage of review at time of this submission	Review stage	Started / Completed
		Preliminary searches	☐ / ☐
		Piloting of the study selection process	☐ / ☐
		Formal screening of search results against eligibility criteria	☐ / ☐
		Data extraction	☐ / ☐
		Risk of bias (quality) assessment	☐ / ☐
		Data analysis	☐ / ☐
24.	Named contact	5a. Named contact National Guideline Centre	

		5b Named contact e-mail [Guideline email]@nice.org.uk [Developer to check with Guideline Coordinator for email address] 5e Organisational affiliation of the review National Institute for Health and Care Excellence (NICE) and the National Guideline Centre
25.	Review team members	From the National Guideline Centre: Carlos Sharpin [Guideline lead] Julie Neilson [Senior systematic reviewer] George Wood [Systematic reviewer] David Wonderling [Senior health economist] Muksitur Rahman [Health economist] Joseph Runicles [Information specialist] Amber Hernaman [Project manager]
26.	Funding sources/sponsor	This systematic review is being completed by the National Guideline Centre which receives funding from NICE.
27.	Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.

28.	Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/indevelopment/gid-ng10127	
29.	Other registration details		
30.	Reference/URL for published protocol		
31.	Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.	
32.	Keywords	Adults; Follow-up; Osteoarthritis; Primary care; Review	
33.	Details of existing review of same topic by same authors		
34.	Current review status	☒	Ongoing
		☐	Completed but not published
		☐	Completed and published
		☐	Completed, published and being updated
		☐	Discontinued
35..	Additional information	N/A	
36.	Details of final publication	www.nice.org.uk	

Table 2: Health economic review protocol

Review question	All questions – health economic evidence
Objectives	To identify health economic studies relevant to any of the review questions.
Search criteria	• Populations, interventions and comparators must be as specified in the clinical review protocol above. • Studies must be of a relevant health economic study design (cost–utility analysis, cost-effectiveness analysis, cost–benefit analysis, cost–consequences analysis, comparative cost analysis). • Studies must not be a letter, editorial or commentary, or a review of health economic evaluations. (Recent reviews will be ordered although not reviewed. The bibliographies will be checked for relevant studies, which will then be ordered.) • Unpublished reports will not be considered unless submitted as part of a call for evidence. • Studies must be in English.
Search strategy	A health economic study search will be undertaken for all years using population-specific terms and a health economic study filter – see appendix B below.
Review strategy	Studies not meeting any of the search criteria above will be excluded. Studies published before 2005, abstract-only studies and studies from non-OECD countries or the USA will also be excluded. Studies published in 2005 or later, that were included in the previous guidelines, will be reassessed for inclusion and may be included or selectively excluded based on their relevance to the questions covered in this update and whether more applicable evidence is also identified. Each remaining study will be assessed for applicability and methodological limitations using the NICE economic evaluation checklist which can be found in appendix H of Developing NICE guidelines: the manual (2014).[4] **Inclusion and exclusion criteria** • If a study is rated as both 'Directly applicable' and with 'Minor limitations' then it will be included in the guideline. A health economic evidence table will be completed and it will be included in the health economic evidence profile. • If a study is rated as either 'Not applicable' or with 'Very serious limitations' then it will usually be excluded from the guideline. If it is excluded then a health economic evidence table will not be completed and it will not be included in the health economic evidence profile. • If a study is rated as 'Partially applicable', with 'Potentially serious limitations' or both then there is discretion over whether it should be included.

Where there is discretion

The health economist will make a decision based on the relative applicability and quality of the available evidence for that question, in discussion with the guideline committee if required. The ultimate aim is to include health economic studies that are helpful for decision-making in the context of the guideline and the current NHS setting. If several studies are considered of sufficiently high applicability and methodological quality that they could all be included, then the health economist, in discussion with the committee if required, may decide to include only the most applicable studies and to selectively exclude the remaining studies. All studies excluded on the basis of applicability or methodological limitations will be listed with explanation in the excluded health economic studies appendix below.

The health economist will be guided by the following hierarchies.

Setting:

- UK NHS (most applicable).
- OECD countries with predominantly public health insurance systems (for example, France, Germany, Sweden).
- OECD countries with predominantly private health insurance systems (for example, Switzerland).
- Studies set in non-OECD countries or in the USA will be excluded before being assessed for applicability and methodological limitations.

Health economic study type:

- Cost–utility analysis (most applicable).
- Other type of full economic evaluation (cost–benefit analysis, cost-effectiveness analysis, cost–consequences analysis).
- Comparative cost analysis.
- Non-comparative cost analyses including cost-of-illness studies will be excluded before being assessed for applicability and methodological limitations.

Year of analysis:

- The more recent the study, the more applicable it will be.
- Studies published in 2005 or later (including any such studies included in the previous guidelines) but that depend on unit costs and resource data entirely or predominantly from before 2005 will be rated as 'Not applicable'.
- Studies published before 2005 (including any such studies included in the previous guidelines) will be excluded before being assessed for applicability and methodological limitations.

Quality and relevance of effectiveness data used in the health economic analysis:

- The more closely the clinical effectiveness data used in the health economic analysis match with the outcomes of the studies included in the clinical review the more useful the analysis will be for decision-making in the guideline.

Appendix B – Literature search strategies

- Is regular follow-up and review needed for people with osteoarthritis?

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual.[4]

For more information, please see the Methodology review published as part of the accompanying documents for this guideline.

B.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.

Table 3: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 17 November 2021	Randomised controlled trials Systematic review studies Observational studies Exclusions (animals studies, letters, comments)
Embase (OVID)	1974 – 17 November 2021	Randomised controlled trials Systematic review studies Observational studies Exclusions (animals studies, letters, comments)
The Cochrane Library (Wiley)	Cochrane Reviews to 2021 Issue 11 of 12 CENTRAL to 2021 Issue 11 of 12	None

Medline (Ovid) search terms

1.	exp osteoarthritis/
2.	(osteoarthriti* or osteo-arthriti* or osteoarthrotic or osteoarthros*).ti,ab.
3.	(degenerative adj2 arthritis).ti,ab.
4.	coxarthrosis.ti,ab.
5.	gonarthrosis.ti,ab.
6.	or/1-5
7.	letter/
8.	editorial/
9.	news/
10.	exp historical article/
11.	Anecdotes as Topic/
12.	comment/

13.	case report/
14.	(letter or comment*).ti.
15.	or/7-14
16.	randomized controlled trial/ or random*.ti,ab.
17.	15 not 16
18.	animals/ not humans/
19.	exp Animals, Laboratory/
20.	exp Animal Experimentation/
21.	exp Models, Animal/
22.	exp Rodentia/
23.	(rat or rats or mouse or mice or rodent*).ti.
24.	or/17-23
25.	6 not 24
26.	limit 25 to English language
27.	((regular or standard* or structured) adj2 (follow*-up* or followup* or check-up* or checkup* or consultation*)).ti,ab.
28.	((interval* or frequen* or week* or month* or year* or annual* or time* or timing*) adj2 (follow*-up* or followup* or check-up* or checkup* or consultation* or review* or appointment*)).ti,ab.
29.	((review* or appointment* or consultation*) adj2 (follow*-up* or followup* or checkup* or check*-up*)).ti,ab.
30.	or/27-29
31.	26 and 30
32.	randomized controlled trial.pt.
33.	controlled clinical trial.pt.
34.	randomi#ed.ti,ab.
35.	placebo.ab.
36.	randomly.ti,ab.
37.	Clinical Trials as topic.sh.
38.	trial.ti.
39.	or/32-38
40.	Meta-Analysis/
41.	exp Meta-Analysis as Topic/
42.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
43.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
44.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
45.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
46.	(search* adj4 literature).ab.
47.	(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.
48.	cochrane.jw.
49.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
50.	or/40-49
51.	Epidemiologic studies/

52.	Observational study/
53.	exp Cohort studies/
54.	(cohort adj (study or studies or analys* or data)).ti,ab.
55.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
56.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.
57.	Controlled Before-After Studies/
58.	Historically Controlled Study/
59.	Interrupted Time Series Analysis/
60.	(before adj2 after adj2 (study or studies or data)).ti,ab.
61.	exp case control studies/
62.	case control*.ti,ab.
63.	Cross-sectional studies/
64.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
65.	or/51-64
66.	31 and (39 or 50 or 65)

Embase (Ovid) search terms

1.	exp osteoarthritis/
2.	(osteoarthriti* or osteo-arthriti* or osteoarthrotic or osteoarthros*).ti,ab.
3.	(degenerative adj2 arthritis).ti,ab.
4.	coxarthrosis.ti,ab.
5.	gonarthrosis.ti,ab.
6.	or/1-5
7.	letter.pt. or letter/
8.	note.pt.
9.	editorial.pt.
10.	case report/ or case study/
11.	(letter or comment*).ti.
12.	or/7-11
13.	randomized controlled trial/ or random*.ti,ab.
14.	12 not 13
15.	animal/ not human/
16.	nonhuman/
17.	exp Animal Experiment/
18.	exp Experimental Animal/
19.	animal model/
20.	exp Rodent/
21.	(rat or rats or mouse or mice or rodent*).ti.
22.	or/14-21
23.	6 not 22
24.	Limit 23 to English language
25.	((regular or standard* or structured) adj2 (follow*-up* or followup* or check-up* or checkup* or consultation*)).ti,ab.

26.	((interval* or frequen* or week* or month* or year* or annual* or time* or timing*) adj2 (follow*-up* or followup* or check-up* or checkup* or consultation* or review* or appointment*)).ti,ab.
27.	((review* or appointment* or consultation*) adj2 (follow*-up* or followup* or checkup* or check-up*)).ti,ab.
28.	or/25-27
29.	24 and 28
30.	random*.ti,ab.
31.	factorial*.ti,ab.
32.	(crossover* or cross over*).ti,ab.
33.	((doubl* or singl*) adj blind*).ti,ab.
34.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
35.	crossover procedure/
36.	single blind procedure/
37.	randomized controlled trial/
38.	double blind procedure/
39.	or/30-38
40.	systematic review/
41.	meta-analysis/
42.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
43.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
44.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
45.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
46.	(search* adj4 literature).ab.
47.	(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.
48.	cochrane.jw.
49.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
50.	or/40-49
51.	Clinical study/
52.	Observational study/
53.	family study/
54.	longitudinal study/
55.	retrospective study/
56.	prospective study/
57.	cohort analysis/
58.	follow-up/
59.	cohort*.ti,ab.
60.	58 and 59
61.	(cohort adj (study or studies or analys* or data)).ti,ab.
62.	((follow up or observational or uncontrolled or non randomi#ed or epidemiologic*) adj (study or studies or data)).ti,ab.
63.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort* or data)).ti,ab.

64.	(before adj2 after adj2 (study or studies or data)).ti,ab.
65.	exp case control study/
66.	case control*.ti,ab.
67.	cross-sectional study/
68.	(cross sectional and (study or studies or review or analys* or cohort* or data)).ti,ab.
69.	or/51-57,60-68
70.	29 and (39 or 50 or 69)

Cochrane Library (Wiley) search terms

#1.	MeSH descriptor: [Osteoarthritis] explode all trees
#2.	(osteoarthriti* or osteo-arthriti* or osteoarthrotic or osteoarthros*):ti,ab
#3.	(degenerative near/2 arthritis):ti,ab
#4.	coxarthrosis:ti,ab
#5.	gonarthrosis:ti,ab
#6.	(or #1-#5)
#7.	((regular or standard* or structured) near/2 (follow* up* or followup* or check up* or checkup* or consultation*)):ti,ab
#8.	((interval* or frequen* or week* or month* or year* or annual* or time* or timing*) near/2 (follow* up* or followup* or check up* or checkup* or consultation* or review* or appointment*)):ti,ab
#9.	((review* or appointment* or consultation*) near/2 (follow* up* or followup* or checkup* or check up*)):ti,ab
#10.	(or #7-#9)
#11.	#6 and #10

B.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to a Gout population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA – this ceased to be updates after March 2018). NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional searches were run on Medline and Embase for health economics studies and quality of life studies. Searches for quality of life studies were run for general information.

Table 4: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	1 January 2014 – 17 November 2021	Health economics studies Quality of life studies Exclusions (animals studies, letters, comments)
Embase	1 January 2014 – 17 November 2021	Health economics studies Quality of life studies Exclusions (animals studies, letters, comments)
Centre for Research and Dissemination (CRD)	HTA - Inception – 31 March 2018	None

Database	Dates searched	Search filter used
	NHSEED - Inception to 31 March 2015	

Medline (Ovid) search terms

1.	exp osteoarthritis/
2.	(osteoarthriti* or osteo-arthriti* or osteoarthrotic or osteoarthros*).ti,ab.
3.	(degenerative adj2 arthritis).ti,ab.
4.	coxarthrosis.ti,ab.
5.	gonarthrosis.ti,ab.
6.	or/1-5
7.	letter/
8.	editorial/
9.	news/
10.	exp historical article/
11.	Anecdotes as Topic/
12.	comment/
13.	case report/
14.	(letter or comment*).ti.
15.	or/7-14
16.	randomized controlled trial/ or random*.ti,ab.
17.	15 not 16
18.	animals/ not humans/
19.	exp Animals, Laboratory/
20.	exp Animal Experimentation/
21.	exp Models, Animal/
22.	exp Rodentia/
23.	(rat or rats or mouse or mice or rodent*).ti.
24.	or/17-23
25.	6 not 24
26.	limit 25 to English language
27.	Economics/
28.	Value of life/
29.	exp "Costs and Cost Analysis"/
30.	exp Economics, Hospital/
31.	exp Economics, Medical/
32.	Economics, Nursing/
33.	Economics, Pharmaceutical/
34.	exp "Fees and Charges"/
35.	exp Budgets/
36.	budget*.ti,ab.

37.	cost*.ti.
38.	(economic* or pharmaco?economic*).ti.
39.	(price* or pricing*).ti,ab.
40.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
41.	(financ* or fee or fees).ti,ab.
42.	(value adj2 (money or monetary)).ti,ab.
43.	or/27-42
44.	quality-adjusted life years/
45.	sickness impact profile/
46.	(quality adj2 (wellbeing or well being)).ti,ab.
47.	sickness impact profile.ti,ab.
48.	disability adjusted life.ti,ab.
49.	(qal* or qtime* or qwb* or daly*).ti,ab.
50.	(euroqol* or eq5d* or eq 5*).ti,ab.
51.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
52.	(hui or hui1 or hui2 or hui3).ti,ab.
53.	(health* year* equivalent* or hye or hyes).ti,ab.
54.	discrete choice*.ti,ab.
55.	rosser.ti,ab.
56.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
57.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
58.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
59.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
60.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
61.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
62.	or/44-61
63.	26 and (43 or 62)

Embase (Ovid) search terms

1.	exp osteoarthritis/
2.	(osteoarthriti* or osteo-arthriti* or osteoarthrotic or osteoarthros*).ti,ab.
3.	(degenerative adj2 arthritis).ti,ab.
4.	coxarthrosis.ti,ab.
5.	gonarthrosis.ti,ab.
6.	or/1-5
7.	letter.pt. or letter/
8.	note.pt.
9.	editorial.pt.
10.	case report/ or case study/

11.	(letter or comment*).ti.
12.	or/7-11
13.	randomized controlled trial/ or random*.ti,ab.
14.	12 not 13
15.	animal/ not human/
16.	nonhuman/
17.	exp Animal Experiment/
18.	exp Experimental Animal/
19.	animal model/
20.	exp Rodent/
21.	(rat or rats or mouse or mice or rodent*).ti.
22.	or/14-21
23.	6 not 22
24.	Limit 23 to English language
25.	health economics/
26.	exp economic evaluation/
27.	exp health care cost/
28.	exp fee/
29.	budget/
30.	funding/
31.	budget*.ti,ab.
32.	cost*.ti.
33.	(economic* or pharmaco?economic*).ti.
34.	(price* or pricing*).ti,ab.
35.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
36.	(financ* or fee or fees).ti,ab.
37.	(value adj2 (money or monetary)).ti,ab.
38.	or/25-37
39.	quality adjusted life year/
40.	"quality of life index"/
41.	short form 12/ or short form 20/ or short form 36/ or short form 8/
42.	sickness impact profile/
43.	(quality adj2 (wellbeing or well being)).ti,ab.
44.	sickness impact profile.ti,ab.
45.	disability adjusted life.ti,ab.
46.	(qal* or qtime* or qwb* or daly*).ti,ab.
47.	(euroqol* or eq5d* or eq 5*).ti,ab.
48.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
49.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.

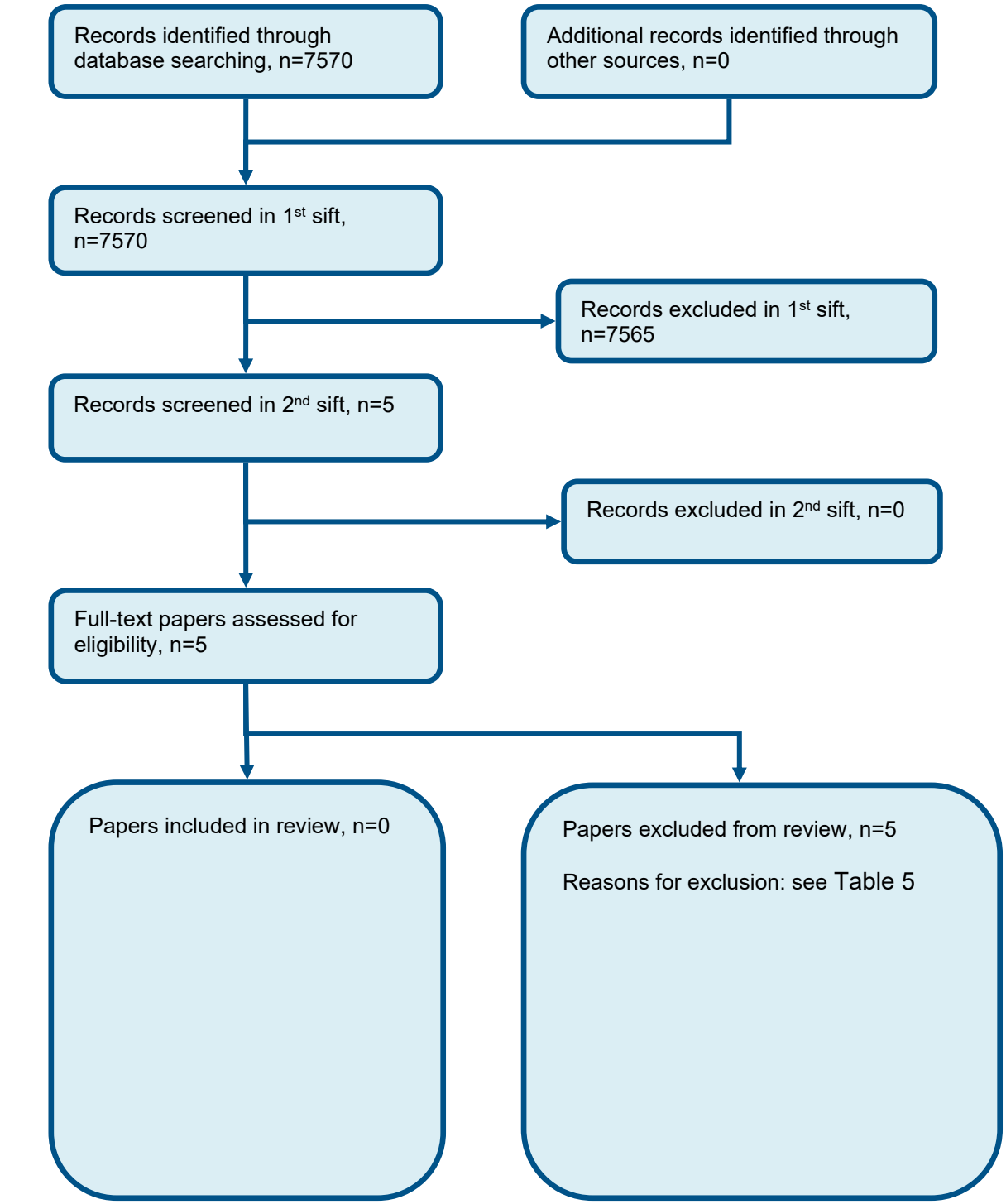
50.	(hui or hui1 or hui2 or hui3).ti,ab.
51.	(health* year* equivalent* or hye or hyes).ti,ab.
52.	discrete choice*.ti,ab.
53.	rosser.ti,ab.
54.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
55.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
56.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
57.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
58.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
59.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
60.	or/39-59
61.	24 and (38 or 60)

NHS EED and HTA (CRD) search terms

#1.	MeSH DESCRIPTOR Osteoarthritis EXPLODE ALL TREES
#2.	((osteoarthriti* or osteo-arthriti* or osteoarthrotic or osteoarthros*))
#3.	((degenerative adj2 arthritis))
#4.	(coxarthrosis)
#5.	(gonarthrosis)
#6.	#1 OR #2 OR #3 OR #4 OR #5
#7.	(#6) IN NHSEED
#8.	(#6) IN HTA

Appendix C – Effectiveness evidence study selection

Figure 1: Flow chart of clinical study selection for the review of follow up and review



Appendix D – Effectiveness evidence

No studies were included.

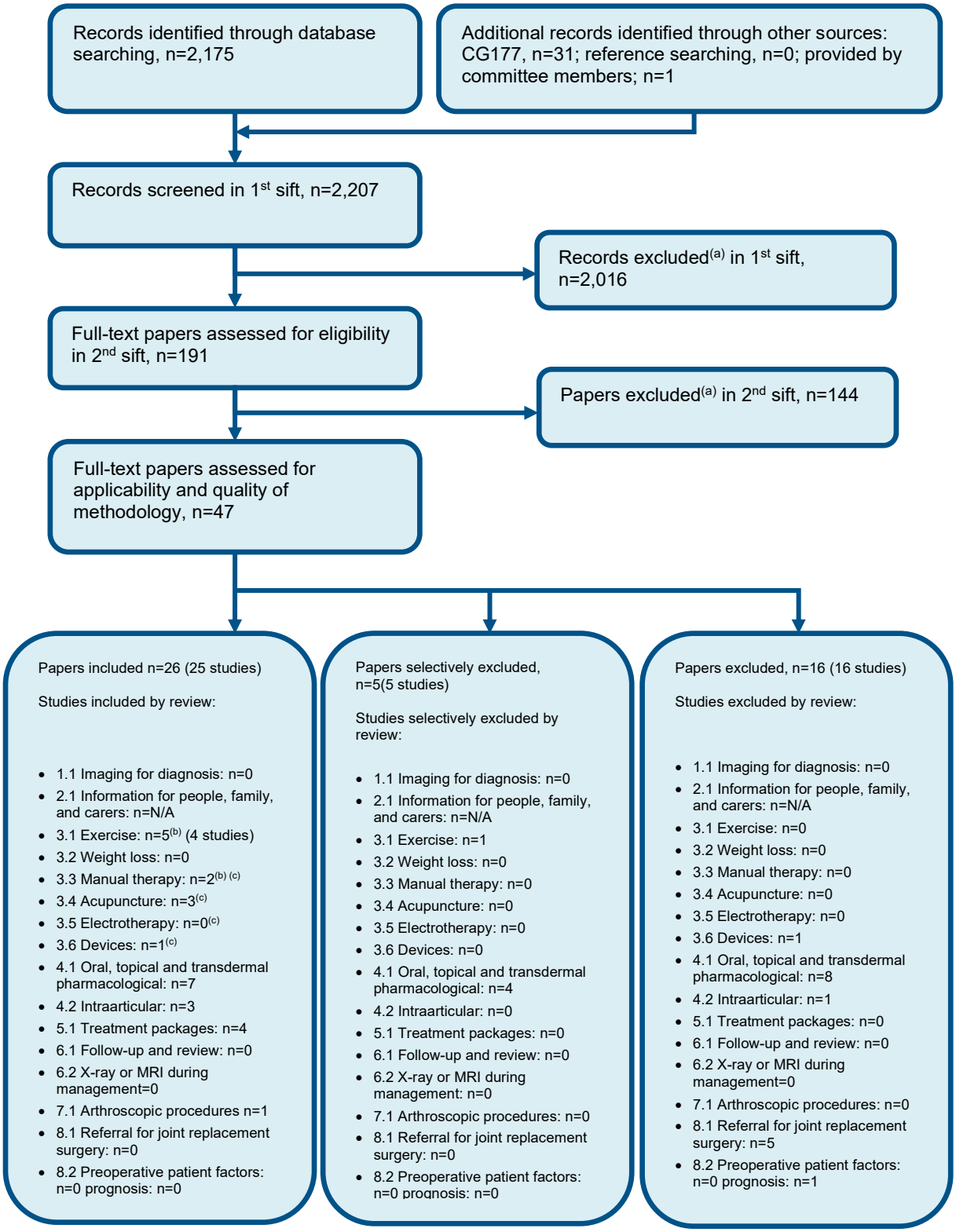
Appendix E – Forest plots

No studies were included.

Appendix F – GRADE tables

No studies were included.

Appendix G – Economic evidence study selection



(a) Non-relevant population, intervention, comparison, design or setting; non-English language.
(b) Two articles identified were applicable to Q3.1 and Q3.3, for the purposes of this diagram they have been included under Q3.1 only.
(c) One article identified was applicable to Q3.3, Q3.4, Q3.5 and Q3.6, for the purposes of this diagram it has been included under Q3.3 only.

Appendix H – Economic evidence tables

There were no health economic studies found in the review.

Appendix I – Health economic model

No original economic modelling was undertaken.

Appendix J – Excluded studies

Clinical studies

Table 5: Studies excluded from the clinical review

Study	Exclusion reason
Ahn 2016[1]	Conference abstract only
Hinman 2020[3]	Incorrect interventions (follow up for an intervention)
Ravaud 2009[5]	Inappropriate comparison (compares regular follow up to as many follow up appointments in a limited time period, rather than symptom-led follow up)
Smith 2015[6]	Conference abstract only
Wang 2021[7]	Incorrect intervention (predictors for early stage arthritis- all people had imaging. No relevant information for follow-up review)
Wetzels 2008[8]	Inappropriate comparison (compares regular follow up to no follow up)

Health Economic studies

Published health economic studies that met the inclusion criteria (relevant population, comparators, economic study design, published 2005 or later and not from non-OECD country or USA) but that were excluded following appraisal of applicability and methodological quality are listed below. See the health economic protocol for more details.

None.

Appendix K – Research recommendations – full details

K.1 Research recommendation

What is the clinical and cost effectiveness of patient-initiated follow-up compared with routine follow-up for people with osteoarthritis?

K.1.1 Why this is important

Evidence in lacking as to the optimal follow up strategy for people with osteoarthritis. In most cases patient initiated follow up is likely to be sufficient however there may be instances where this is not appropriate. The committee considered this might apply to those who have communication difficulties or learning disability; in people with multi-morbidities where osteoarthritis is not seen as a priority and for people where clinicians are uncertain the patient will access care when it is needed. In this review the committee investigated the effect of symptom led follow up and routine follow up and identified no evidence. The committee recommended that patient led follow up was likely to be appropriate for most people. However, the committee agreed that further research was required to ensure that the most optimal follow up was provided for people with osteoarthritis.

K.1.2 Rationale for research recommendation

Importance to 'patients' or the population	Osteoarthritis is a long term condition and the optimal follow up arrangements are unclear. Formalising routine follow-up may assure patients and clinicians that the condition is being monitored, but the prognostic benefit is unclear. Furthermore, formalised follow up in stable patients, which does not add value, may be an inconvenience to patients and may mean clinicians have less time to spend with individuals who present with symptom deterioration.
Relevance to NICE guidance	No evidence was identified for this review question. If this evidence is available then that would help to increase the certainty in the consensus recommendations made by the committee.
Relevance to the NHS	Formalising routine follow-up would present an opportunity cost for the NHS, which would be justified if it resulted in a quality of life or prognostic benefit for patients. However, if it offers neither then it is likely to have a significant resource impact and is unlikely to be justified.
National priorities	This is an area of national priority discussed in the UK government guidance for 'Productive healthy ageing and musculoskeletal (MSK) health'.
Current evidence base	There was no evidence identified that fulfilled the protocol for this review.
Equality considerations	Follow up strategies may need to be adapted for people who may have reasons affecting their ability to seek help from healthcare services.

	This could include specific diverse groups, such as people with learning disabilities. Special consideration should be given to this group when conducting this research. The committee noted that the osteoarthritis research in general does not appear to represent the diverse population of people with osteoarthritis. They agreed that any further research should be representative of the population, including people from different family backgrounds, and socioeconomic backgrounds, disabled people, and people of different ages and genders. Future work should be done to consider the different experiences of people from diverse communities to ensure that the approach taken can be made equitable for everyone.

K.1.3 Modified PICO table

Population	Inclusion: • Adults (age ≥16 years) with osteoarthritis affecting any joint Exclusion: • Children (age <16 years) • People with conditions that may make them susceptible to osteoarthritis or often occur alongside osteoarthritis (including: crystal arthritis, inflammatory arthritis, septic arthritis, diseases of childhood that may predispose to osteoarthritis, medical conditions presenting with joint inflammation and malignancy). • Spinal osteoarthritis
Intervention	• Structured, regular follow up appointments dedicated to the topic of osteoarthritis (in a United Kingdom primary care setting or relevant equivalent setting in other countries) at a specified frequency in addition to person-led follow up. • Person led follow-up only
Comparator	Each other
Outcome	Reported at least at 3 months and a long term follow up period after 3 months (for example: 5 year): • Health-related quality of life [validated patient-reported outcomes, continuous data] • Pain [validated patient-reported outcomes, continuous data] • Physical function [validated patient-reported outcomes, continuous data

	• Changes to planned management [dichotomous data] • Psychological distress [validated patient-reported outcomes, continuous data] • Osteoarthritis flares [dichotomous] • Falls [dichotomous] • Residential service or hospital admission (including disability allowance) [dichotomous] • Progression to joint replacement [dichotomous] • Qualitative experiences of the person and clinician perspectives to structured and person led follow up
Study design	Randomised controlled trial (a cluster randomised design may be appropriate here)
Timeframe	Long term (5 year follow up to ensure the chronic nature of the condition is considered)
Additional information	Subgroups for: • Diagnosis of learning disability • Age • BMI category (underweight, healthy weight, overweight) • Rural compared to urban setting