National Institute for Health and Care Excellence

Draft

Obstructive sleep apnoea/ hypopnoea syndrome and obesity hypoventilation syndrome in over 16s

Evidence review C: Prioritisation for rapid assessment at a sleep centre of people with suspected OSAHS, OHS or COPD-OSAHS overlap syndrome for further assessment

NICE guideline

Qualitative evidence review

March 2021

Draft for Consultation

Developed by the National Guideline Centre

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Disclaimer

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1 Prioritisation

1.1 Review question: Which people with suspected obstructive sleep apnoea/hypopnoea syndrome (OSAHS), obesity hypoventilation syndrome (OHS) or COPD-OSAHS overlap syndrome should be prioritised for further assessment?

1.2 Introduction

People with suspected obstructive sleep apnoea/hypopnoea syndrome (OSAHS),obesity hypoventilation syndrome (OHS) or COPD-OSAHS overlap syndrome symptoms should be prioritised for further assessment both in primary and secondary care. There can be delays in accessing further investigation and some services prioritise certain groups, either because their disease needs urgent treatment for its health implications or because of occupational risk (e.g. being a HGV driver). This review aims to identify studies in which people with suspected OSAHS/OHS/COPD-OSAHS overlap syndrome and their healthcare professionals discuss the benefits and harms of prioritisation as well as groups who are likely to benefit most from it.

1.3 Characteristics table

For full details see the review protocol in Appendix A: A.

Table 1: Characteristics of review question

Objective	To find out through qualitative research which people with suspected sleep apnoea/hypopnea syndrome, obesity hypoventilation syndrome or COPD-OSAHS overlap syndrome (and their carers and healthcare professionals) should be prioritised for further assessment.
Population and setting	People suspected /who have been investigated for OSAHS/OHS/ COPD-OSAHS overlap syndrome, their family/carers and healthcare professionals involved in their care
Context	Harms and benefits of prioritisation as well as groups that are likely to benefit most from it as described by studies
Review strategy	Synthesis of qualitative research. Results presented in narrative format. Quality of the evidence will be assessed by a GRADE CerQual approach for each review finding.

1.4 Qualitative evidence

1.4.1 Included studies

OSAHS

No evidence was identified for people with OSAHS.

OHS

No evidence was identified for people with OHS.

COPD-OSAHS overlap syndrome

No evidence was identified for people with COPD-OSAHS overlap syndrome.

1.4.2 Excluded studies

See the excluded studies list in appendix E.

1.4.3 Summary of qualitative studies included in the evidence review

No studies were included in the review.

1.4.4 Qualitative evidence synthesis

No studies were included in the review.

1.4.4.1 Narrative summary of review findings

No studies were included in the review.

1.4.5 Qualitative evidence summary

No evidence was identified.

1.5 Economic evidence

The committee agreed that health economic studies would not be relevant to this review question, and so were not sought.

1.6 The committee's discussion of the evidence

1.6.1 Interpreting the evidence

1.6.1.1 The outcomes that matter most

The committee considered harms and benefits of prioritisation as well as groups that are likely to benefit most from it as critical for decision making.

No evidence was identified for groups that will benefit from prioritisation and benefits and harms of prioritisation in people with OSAHS/OHS/COPD-OSAHS overlap syndrome and family/carers and healthcare professionals.

1.6.1.2 The quality of the evidence

No evidence was available for this review question.

1.6.1.3 Evidence identified in the evidence synthesis

OSAHS (all severities)

There was no evidence for prioritising people for rapid assessment by a sleep centre for people with OSAHS, so the guideline committee made recommendations based on their experience and knowledge of current practice. The committee defined prioritisation as giving precedence to specific groups of people for referral to a sleep service; clinicians then may prioritise these people for a sleep study. However, with sufficient referral details some patients may be fast-tracked directly to a sleep study. Service provision and waiting times vary across sleep centres and regions in England, so the committee used their knowledge and experience to identify groups that would benefit most from prompt assessment and treatment.

The committee discussed the effect of OSAHS on work performance and safety. In particular, how it could increase the risk of work accidents in safety-sensitive occupations. People with a wide range of jobs or activities could be affected, for example, drivers, train drivers, pilots, heavy machinery operators, surgeons and people caring for vulnerable children or adults. Therefore, the committee agreed that these groups of people with suspected OSAHS should be prioritised for rapid assessment and treatment because of the risk of occupational accidents and errors.

It was noted that DVLA guidance Assessing fitness to drive[7] recommends that drivers with suspected or confirmed OSAHS and excessive sleepiness having, or likely to have, an adverse impact on driving must not drive until there is satisfactory symptom control. Control of symptoms is likely to require assessment and treatment from a sleep specialist. The committee agreed that one of the main symptoms of sleep apnoea is excessive sleepiness, which could lead to impaired performance while driving or flying and a substantial risk for accidents. Although all people with suspected OSAHS could be at risk, the committee agreed that vocational drivers, train drivers and pilots were at higher risk because of the long distances travelled by them or the number of hours spent driving or flying. Therefore they recommend that vocational drivers such as bus, train and lorry drivers, and pilots in whom OSAHS is suspected should be offered early assessment and treatment.

The committee discussed that people with unstable cardiovascular disease for example people with poorly controlled arrhythmia, nocturnal angina, or treatment resistant hypertension should be prioritised for early referral to a sleep clinic. They noted that untreated OSAHS is recognised as a risk factor for treatment resistant hypertension and recurrence of atrial flutter in those treated with ablative therapy. Therefore, it was agreed that people with unstable cardiovascular disease should be prioritised because of the risks of worsening cardiovascular disease or adverse events.

The committee discussed that pregnancy in sleep apnoea could be associated with poor maternal and foetal outcomes; hence they agreed that pregnant women with suspected OSAHS should be prioritised for early referral for further management.

The committee from their experience agreed that OSAHS may be suspected during pre-operative assessment. In those with a high probability of OSAHS in who need major surgery, fast track provision of sleep study and treatment should be provided. Once treatment e.g. CPAP is shown to control symptoms and AHI surgery can proceed.

The committee from their experience agreed that there is a risk of sudden blindness in patients with non arteritic anterior ischaemic optic neuropathy and OSAHS, so urgent referral for diagnosis and treatment is advisable.The committee agreed that to ensure that patients are prioritised appropriately by sleep teams, and to allow fast-tracking of people directly to a sleep study, key details should be included in a referral letter. These include the person's sleepiness score; how sleepiness affects the individual, for example, when at work, studying or driving; and information on comorbidities and conditions which may be adversely affected by OSAHS.The committee agreed that these recommendations are applicable to both primary and secondary care settings.

In current practice specific groups are not always prioritised for referral, therefore implementing these recommendations will mean a change in practice for some providers. There is increasing pressure on sleep services and offering higher priority to some groups may delay sleep studies for other people. Planning and provision of rapid-access sleep studies may help to reduce the pressure on services, with triage of referrals allowing people to be fast-tracked directly to a diagnostic study.

The committee discussed that there were a variety of ways in which sleep teams could deliver a fast track service, therefore did not wish to be prescriptive of how this is achieved.

Even though there was a lack of evidence for prioritising people for rapid assessment by a sleep centre for people with OSAHS, based on their experience the committee made strong recommendations hence they did not make any research recommendation for this topic.

OHS

Due to lack of evidence for people with OHS, the committee made the recommendations based on their knowledge and collective experience to identify groups that would benefit most from prompt assessment and treatment.OHS is a common condition but it is frequently misdiagnosed/underdiagnosed and early diagnosis and treatment is important, because delay in treatment is associated with significant morbidity and mortality. Hence the committee highlighted the need for timely diagnosis and management of people with this condition.

The committee from their experience stated that people with BMI over 30 kg/m^2 and severe hypercapnia e.g. PCO2 >7 kPa, or hypoxaemia (arterial oxygen saturation less than 94%) should have early referral as they have chronic ventilatory failure and are at risk of acute decompensated ventilatory failure both of which carry a poor prognosis.

The committee discussed that OSAHS is common in people with OHS and the effect of OSAHS on work performance and safety. In particular, how it could increase the risk of work accidents in safety-sensitive occupations. People with a wide range of jobs or activities could be affected, for example, drivers, train drivers, pilots, heavy machinery operators, surgeons and people caring for vulnerable children or adults. Therefore, the committee agreed that these groups of people with suspected OHS should be referred for early assessment and treatment because of the risk of occupational accidents and errors.

It was noted that DVLA guidance Assessing fitness to drive[7] recommends that drivers with suspected or confirmed OSAHS and excessive sleepiness having, or likely to have, an adverse impact on driving must not drive until there is satisfactory symptom control. Control of symptoms is likely to require assessment and treatment from a sleep specialist. The committee agreed that one of the main symptoms of sleep apnoea is excessive sleepiness, which could lead to impaired performance while driving or flying and a substantial risk for accidents. Although all people with suspected OSAHS could be at risk, the committee agreed that vocational drivers, train drivers and pilots were at higher risk because of the long distances travelled by them or the number of hours spent driving or flying. Therefore they recommend that vocational drivers such as bus, train and lorry drivers, and pilots in whom OHS is suspected should be offered early assessment and treatment.

The committee discussed that pregnant women should be referred urgently for sleep study and treatment, as uncontrolled OHS may affect foetal and maternal outcome.

The committee discussed the clinical decision to prioritise should be in people with unstable cardiovascular disease for example people with poorly controlled arrhythmia, nocturnal angina, and treatment resistant hypertension. They highlighted that untreated OHS adversely affects these conditions and can be associated with worse outcomes or failure to respond to cardiac therapy.The committee agreed that people with OHS and unstable cardiovascular disease should be offered early investigation and treatment, as cardiovascular complications are a major cause of mortality and morbidity in OHS.

The committee from their experience agreed that in people with high probability of OHS who need major surgery, fast track provision of sleep study and treatment should be provided. Once treatment is shown to control symptoms and AHI surgery can proceed. The committee from their experience agreed that there is a risk of sudden blindness in patients with non arteritic anterior ischaemic optic neuropathy and OHS, so urgent referral for diagnosis and treatment is advisable.

Based on their experience, the committee discussed that key details such as results of the person's sleepiness score(s), how sleepiness affects the individual comorbidities, BMI and occupational risk, and any history of acute non-invasive ventilation should be included in referral letters to to facilitate rapid assessment by the sleep centre.

The committee agreed that these recommendations are applicable to both primary and secondary care settings.

In current practice specific groups are not always prioritised for referral, therefore implementing these recommendations will mean a change in practice for many providers. There is increasing pressure on sleep services and offering higher priority to some groups may delay studies for other people. Planning for and provision of rapid-access sleep studies may help to reduce the pressure on services, with triage of referrals allowing people to be fast-tracked directly to a diagnostic study.

Even though there was a lack of evidence for prioritising people for rapid assessment by a sleep centre for people with OHS, based on their experience the committee made strong recommendations hence they did not make any research recommendation for this topic.

COPD-OSAHS overlap syndrome

Due to lack of evidence for people with COPD-OSAHS overlap syndrome, the committee made the recommendations based on their knowledge and collective experience to identify groups that would benefit most form prompt assessment and treatment.

The committee discussed that people with COPD suspected as having COPD-OSAHS overlap syndrome who have severe hypercapnia e.g. PCO2 >7 kPa, or hypoxaemia (arterial oxygen saturation less than 94%) should have early referral as they have chronic ventilatory failure by definition and are at risk of acute decompensated ventilatory failure both of which carry a poor prognosis.

The committee discussed the effect of OSAHS on work performance and safety for people with COPD-OSAHS overlap syndrome. In particular, how it could increase the risk of work accidents in safety-sensitive occupations. People with a wide range of jobs or activities could be affected, for example, drivers, train drivers, pilots, heavy machinery operators, surgeons and people caring for vulnerable children or adults. Therefore, the committee agreed that these groups of people with suspected COPD-OSAHS overlapy syndrome should be referred for early assessment and treatment because of the risk of occupational accidents and errors.

It was noted that DVLA guidance Assessing fitness to drive[7] recommends that drivers with suspected or confirmed OSAHS and excessive sleepiness having, or likely to have, an adverse impact on driving must not drive until there is satisfactory symptom control. Control of symptoms is likely to require assessment and treatment from a sleep specialist. The committee agreed that one of the main symptoms of sleep apnoea is excessive sleepiness, which could lead to impaired performance while driving or flying and a substantial risk for accidents. Although all people with suspected OSAHS could be at risk, the committee agreed that vocational drivers, train drivers and pilots were at higher risk because of the long distances travelled by them or the number of hours spent driving or flying. Therefore they recommend that vocational drivers such as bus, train and lorry drivers, and pilots in whom COPD-OSAHS overlap syndrome is suspected should be offered early assessment and treatment.

The committee from their experience stated that pregnancy in sleep apnoea could be associated with poor maternal and foetal outcomes; hence pregnant women with suspected COPD-OSAHS overlap syndrome should be referred urgently for early sleep study and treatment.

The committee noted that people with suspected COPD-OSAHS overlap syndrome and unstable cardiovascular disease should be offered early investigation and treatment, as vascular complications may be a major cause of mortality and morbidity in COPD-OSAHS overlap syndrome.

The committee discussed that the clinical decision to prioritise should be in people with unstable cardiovascular disease for example people with poorly controlled arrhythmia, nocturnal angina, and treatment resistant hypertension. They agreed that untreated COPD-OSAHS overlap syndrome adversely affects these conditions and can be associated with worse outcomes or failure to respond to cardiac therapy.

The committee from their experience agreed that COPD-OSAHS overlap syndrome may be suspected during pre-operative assessment. In those with a high probability of COPD-OSAHS overlap syndrome in who need major surgery, fast track provision of sleep study and treatment should be provided. Once treatment is shown to control symptoms and AHI surgery can proceed. The committee from their experience noted that there is a risk of sudden blindness in patients with non arteritic anterior ischaemic optic neuropathy and COPD-OSAHS overlap syndrome, so urgent referral for diagnosis and treatment is advisable.

The committee agreed that referral letter to facilitate rapid assessment by the sleep centre should include results of the person's sleepiness score(s), how sleepiness affects the individuals, comorbidities, BMI, severity of COPD (spirometry), frequency of exacerbations, use of home oxygen and occupational risk, and any history of acute non-invasive ventilation.

The committee agreed that these recommendations are applicable to both primary and secondary care settings.

In current practice specific groups are not always prioritised for referral, therefore implementing these recommendations will mean a change in practice for some providers. There is increasing pressure on sleep services, and offering higher priority to some groups may delay studies for other people. Planning for and provision of rapid-access slots for sleep studies may help to reduce the pressure on services, with triage of referrals allowing people to be fast-tracked directly to a diagnostic study.

Even though there was a lack of evidence for prioritising people for rapid assessment by a sleep centre for people with COPD-OSAHS overlap syndrome, based on their experience the committee made strong recommendations hence they did not make any research recommendation for this topic.

1.6.2 Cost effectiveness and resource use

No economic evaluations or clinical studies were identified for this review question. The decision framework the committee used to determine immediate referrals for OSAHS, OHS and COPD-OSAHS overlap syndrome was to establish whether failing to deal with the symptoms immediately could result in avoidable reduction in quality of life due to irreversible changes to a person’s health status or even death. This impact was also considered from a wider societal perspective. For example, vocational road drivers have been prioritised due to the potential increased risk of a road traffic accident which could not only result in risk of casualty for the driver but also their passengers and other road users. The committee also highlighted the need for pregnant women to be prioritised because sleep apnoea could be associated with both poor foetal outcomes as well as poor quality of life for the woman.

When people are prioritised, they should receive their sleep clinic appointment for further assessment (often a sleep study) sooner than those who are not prioritised. Therefore, the

committee explained that this recommendation would not result in a resource impact as it would not increase the number of people being referred.

1.6.3 Other factors the committee took into account

The committee discussed whether they should specify a time period in which high priority patients should be seen. They did not want to be too specific and agreed that patients should be seen ideally within 4 weeks.

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Appendices

Appendix A: Review protocols

Table 2: Review protocol: Prioritisation

Field	Content
PROSPERO registration number	Not registered.
Review title	Prioritisation
Review question	Which people with suspected obstructive sleep apnoea/hypopnoea syndrome, obesity hypoventilation syndrome or COPD-OSAHS overlap syndrome should be prioritised for further assessment?
Objective	This review aims to identify studies in which people with suspected OSAHS/OHS/OS and their healthcare professionals discuss the benefits and harms of prioritisation as well as groups who are likely to benefit most from it. The review will not aim to support resource impact recommendations or specific time cut-offs for referrals.
Searches	The following databases (from inception) will be searched: • Embase • MEDLINE • CINAHL • PsycINFO Searches will be restricted by: • English language studies • Only including studies in OECD countries The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies will be published in the final review.
Condition or domain being studied	Obstructive sleep apnoea/hypopnoea syndrome is the most common form of sleep disordered breathing. The guideline will also cover obesity hypoventilation syndrome and COPD-OSAHS overlap syndrome (the coexistence of obstructive sleep apnoea/hypopnoea syndrome and chronic obstructive pulmonary disease).
Population	People suspected /who have been investigated for OSAHS/OHS/ COPD-OSAHS overlap syndrome, their family/carers and healthcare professionals involved in their care
Intervention/Exposure/Test	Views, opinions and experiences relating to prioritisation
Comparator/Reference standard/Confounding factors	NA
Types of study to be included	Qualitative studies using any appropriate methodology (e.g. semi-structured interviews or focus groups with ethnography or grounded theory based

	analysis) and systematic reviews of qualitative studies will be considered for inclusion.
Other exclusion criteria	Non-English language papers Conference abstracts Non OECD countries
Context	NA
Primary outcomes (critical outcomes)	Outcomes will be dictated by the themes included in the studies in the review, however areas that may be of particular interest include: • Benefits and harms of prioritisation • Impact of delays in investigation • Groups that particularly benefit from prioritisation
Secondary outcomes (important outcomes)	NA
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. A standardised form will be used to extract data from studies (see Developing NICE guidelines: the manual section 6.4).
Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual. • Critical Appraisal Skills Programme (CASP) qualitative checklist 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.
Strategy for data synthesis	Evidence will be analysed using thematic analysis; findings will be presented narratively and diagrammatically where appropriate. Findings will be reported according to GRADE CERQual standards. Additional qualitative studies will be added to the review until themes within the analysis become saturated; i.e. studies will only be included if they contribute towards the development of existing themes or to the development of new themes.
Analysis of sub-groups	NA

Type and method of review	☐	Intervention
	☐	Diagnostic
	☐	Prognostic
	☒	Qualitative
	☐	Epidemiologic
	☐	Service Delivery
	☐	Other (please specify)
Language	English	
Country	England	
Anticipated or actual start date	NA	
Anticipated completion date	NA	
Named contact	5a. Named contact National Guideline Centre 5b Named contact e-mail SleepApnoHypo@nice.org.uk 5e Organisational affiliation of the review National Institute for Health and Care Excellence (NICE) and the National Guideline Centre	
Review team members	From the National Guideline Centre: Carlos Sharpin, Guideline lead Sharangini Rajesh, Senior systematic reviewer Audrius Stonkus, Systematic reviewer Emtiyaz Chowdhury (until January 2020), Health economist David Wonderling, Head of health economics Agnes Cuyas, Information specialist (till December 2019) Jill Cobb, Information specialist	
Funding sources/sponsor	This systematic review is being completed by the National Guideline Centre which receives funding from NICE.	
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.
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-ng10098
Other registration details	NA – not registered.
Reference/URL for published protocol	NA – not registered.
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.
Keywords	-
Details of existing review of same topic by same authors	NA
Additional information	-
Details of final publication	www.nice.org.uk

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Appendix B: Literature search strategies

Sleep apnoea search strategy 10– prioritisation

This literature search strategy was used for the following review;

- Which people with suspected obstructive sleep apnoea/hypopnoea syndrome, obesity hypoventilation syndrome or COPD-OSAHS overlap syndrome should be prioritised for further assessment?

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual.[20]

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

B.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 3: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 6 July 2020	Exclusions Qualitative studies
Embase (OVID)	1974 – 6 July 2020	Exclusions Qualitative studies
CINAHL, Current Nursing and Allied Health Literature (EBSCO)	Inception – 6 July 2020	Exclusions
PsycINFO (ProQuest)	Inception – 6 July 2020	Exclusions Qualitative studies

Medline (Ovid) search terms

1.	exp Sleep Apnea Syndromes/
2.	(sleep* adj4 (apn?ea* or hypopn?ea*)).ti,ab.
3.	(sleep* adj4 disorder* adj4 breath*).ti,ab.
4.	(OSAHS or OSA or OSAS).ti,ab.
5.	(obes* adj3 hypoventil*).ti,ab.
6.	pickwick*.ti,ab.
7.	or/1-6
8.	limit 7 to English language
9.	letter/
10.	editorial/
11.	news/
12.	exp historical article/
13.	Anecdotes as Topic/
14.	comment/
15.	case report/
16.	(letter or comment*).ti.
17.	or/9-16
18.	randomized controlled trial/ or random*.ti,ab.

19.	17 not 18
20.	animals/ not humans/
21.	exp Animals, Laboratory/
22.	exp Animal Experimentation/
23.	exp Models, Animal/
24.	exp Rodentia/
25.	(rat or rats or mouse or mice).ti.
26.	or/19-25
27.	8 not 26
28.	Health Priorities/
29.	Needs Assessment/
30.	"Referral and Consultation"/
31.	Delayed Diagnosis/
32.	(referr* or priorit* or delay*).ti,ab.
33.	(further* adj2 (assess* or investigat*)).ti,ab.
34.	((patient* or group*) adj4 (benefit* or harm*)).ti,ab.
35.	exp Patient Care Planning/
36.	Patient Care Team/
37.	"Delivery of Health Care"/
38.	((care or assess*) adj2 (path* or framework* or plan*)).ti,ab.
39.	Decision making/
40.	(patient-cent* adj3 (decision* or tool* or choice*)).ti,ab.
41.	((indicat* or apprais* or appropriateness) adj4 (criteri* or framework* or method*)).ti,ab.
42.	or/28-41
43.	27 and 42
44.	Qualitative research/ or Narration/ or exp Interviews as Topic/ or exp "Surveys and Questionnaires"/ or Health care surveys/
45.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
46.	(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.
47.	or/44-46
48.	43 and 47

1 **Embase (Ovid) search terms**

1.	exp Sleep Disordered Breathing/
2.	(sleep* adj4 (apn?ea* or hypopn?ea*)).ti,ab.
3.	(sleep* adj4 disorder* adj4 breath*).ti,ab.
4.	(OSAHS or OSA or OSAS).ti,ab.
5.	(obes* adj3 hypoventil*).ti,ab.
6.	pickwick*.ti,ab.
7.	or/1-6
8.	limit 7 to English language
9.	letter.pt. or letter/

10.	note.pt.
11.	editorial.pt.
12.	case report/ or case study/
13.	(letter or comment*).ti.
14.	or/9-13
15.	randomized controlled trial/ or random*.ti,ab.
16.	14 not 15
17.	animal/ not human/
18.	nonhuman/
19.	exp Animal Experiment/
20.	exp Experimental Animal/
21.	animal model/
22.	exp Rodent/
23.	(rat or rats or mouse or mice).ti.
24.	or/16-23
25.	8 not 24
26.	*health care planning/
27.	*needs assessment/
28.	*patient referral/
29.	*delayed diagnosis/
30.	(referr* or priorit* or delay*).ti,ab.
31.	(further* adj2 (assess* or investigat*)).ti,ab.
32.	((patient* or group*) adj4 (benefit* or harm*)).ti,ab.
33.	exp *patient care planning/
34.	*patient care/
35.	*health care delivery/
36.	((care or assess*) adj2 (path* or framework* or plan*)).ti,ab.
37.	*decision making/
38.	(patient-cent* adj3 (decision* or tool* or choice*)).ti,ab.
39.	((indicat* or apprais* or appropriateness) adj4 (criteri* or framework* or method*)).ti,ab.
40.	or/26-39
41.	25 and 40
42.	health survey/ or exp questionnaire/ or exp interview/ or qualitative research/ or narrative/
43.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
44.	(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.
45.	or/42-44
46.	41 and 45

1 **CINAHL (EBSCO) search terms**

S1.	(MH "Sleep Apnea Syndromes+")
S2.	TI (sleep* n4 (apn?ea* or hypopn?ea*))

S3.	AB (sleep* n4 (apn?ea* or hypopn?ea*))
S4.	TI (sleep* n4 disorder* n4 breath*)
S5.	AB (sleep* n4 disorder* n4 breath*)
S6.	TI (OSAHS or OSA or OSAS)
S7.	AB (OSAHS or OSA or OSAS)
S8.	TI (obes* n3 hypoventil*)
S9.	AB (obes* n3 hypoventil*)
S10.	TI (pickwick*)
S11.	AB (pickwick*)
S12.	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11
S13.	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
S14.	S12 NOT S13
S15.	(MH "Health Priorities") OR (MH "Needs Assessment") OR (MH "Referral and Consultation") OR (MH "Diagnosis, Delayed")
S16.	TI (referr* or priorit* or delay*)
S17.	AB (referr* or priorit* or delay*)
S18.	TI (further* n2 (assess* or investigat*))
S19.	AB (further* n2 (assess* or investigat*))
S20.	TI ((patient* or group*) n4 (benefit* or harm*))
S21.	AB ((patient* or group*) n4 (benefit* or harm*))
S22.	(MH "Patient Care Plans+") OR (MH "Health Care Delivery")
S23.	TI ((care or assess*) n2 (path* or framework* or plan*))
S24.	AB ((care or assess*) n2 (path* or framework* or plan*))
S25.	(MH "Decision Making")
S26.	TI (patient-cent* n3 (decision* or tool* or choice*))
S27.	AB (patient-cent* n3 (decision* or tool* or choice*))
S28.	TI ((indicat* or apprais* or appropriateness) n4 (criteri* or framework* or method*))
S29.	AB ((indicat* or apprais* or appropriateness) n4 (criteri* or framework* or method*))
S30.	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 S28 OR S29
S31.	S14 AND S30

1 **PsycINFO (ProQuest) search terms**

1.	((MAINSUBJECT.EXACT.EXPLODE("Sleep Apnea") OR ti,ab(sleep* NEAR/4 (apn?ea* OR hypopn?ea*)) OR ti,ab(sleep* NEAR/4 disorder* NEAR/4 breath*) OR ti,ab(OSAHS OR OSA OR OSAS) OR ti,ab(obes* NEAR/3 hypoventil*) OR ti,ab(pickwick*)) AND (MAINSUBJECT.EXACT("Professional Referral") OR MAINSUBJECT.EXACT("Needs Assessment") OR ti,ab(referr* OR priorit* OR delay*) OR ti,ab(further* NEAR/2 (assess* OR investigat*)) OR ti,ab((patient* OR group*) NEAR/4 (benefit* OR harm*)) OR MAINSUBJECT.EXACT("Treatment Planning") MAINSUBJECT.EXACT("Decision Making") OR ti,ab((care OR assess*) NEAR/2 (path* OR framework* OR plan*)) OR ti,ab(patient-cent* NEAR/3 (decision* OR tool* OR choice*)) OR ti,ab((indicat* OR apprais* OR appropriateness) NEAR/4 (criteri* OR framework* OR method*))) 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

	((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")

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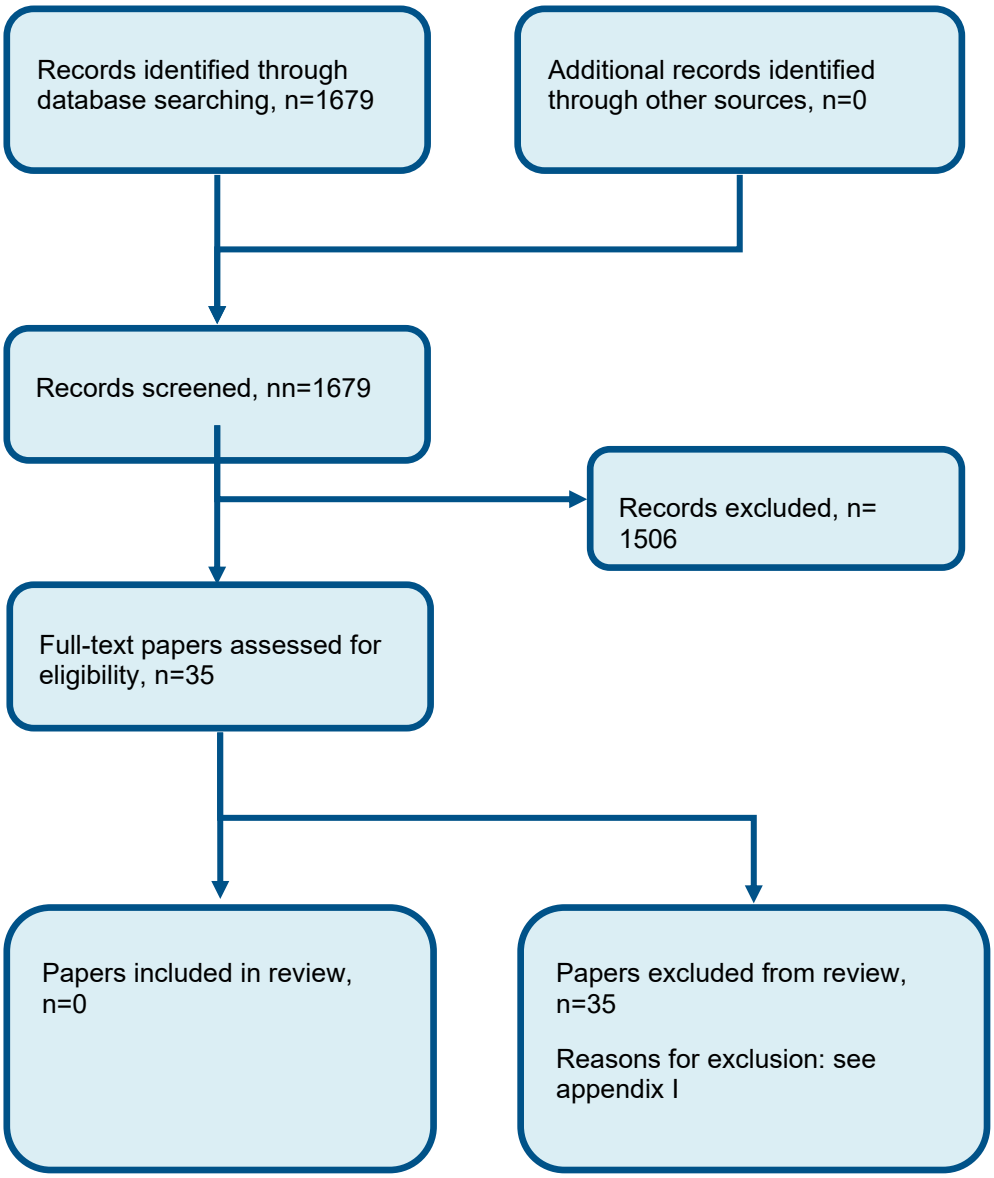
Appendix C: Qualitative evidence selection

Figure 1: Flow chart of qualitative study selection for the review of Prioritisation



Appendix D: Qualitative evidence tables

No evidence

Appendix E: Excluded studies

E.1 Excluded qualitative studies

Table 4: Studies excluded from the qualitative review

Reference	Reason for exclusion
Abma 2019[1]	No information on prioritisation.
Bennett 2017[2]	Incorrect study design - survey of surgeons
Boisteanu 2010[3]	Incorrect study design - literature review
Brostrom 2007[4]	No relevant outcomes only overall experiences of patients suffering from sleep apnoea
Cawley 2016[5]	Systematic - review references checked
Dace 2014[6]	Incorrect study design - program for commercial drivers
Evans 2014[8]	Incorrect study design - Structured survey was used (The sleep apnoea rapid response - SARR)
Fietze 2011[9]	Structured questionnaires
Filiatrault 2002[10]	Incorrect study design - face to face interviews using structured questionnaire
Hanes 2015[12]	No information on prioritisation
Hanes 2015[11]	Semi-structured interviews with practitioners no relevant outcomes/ general experiences of staff providing OSA services
Hayes 2012[13]	Incorrect study design generalists perceptions on sleep apnoea
Jackson 2020[14]	Inappropriate study design - literature review, opinion article
Kapur 2017[15]	Systematic review no qualitative studies included/ no relevant outcomes
Lemus 2018[16]	Incorrect study design post guideline audit
Louis 2017[17]	Abstract only/retrospective chart review
Marchildon 2015[18]	No information on prioritisation.
McNicholas 2000[19]	Incorrect study design - literature review/ opinion
Onwochei 2020[21]	Systematic review - references checked
Paine 2011[22]	Incorrect study design - literature review
Parks 2009[23]	Incorrect study design - medical examinations/ structured questionnaires
Phillips 1992[24]	Incorrect study design - literature review
Rahagh 1999[25]	No information on prioritisation
Robbins 2018[26]	Incorrect study design - data from the 2005-2012 national ambulatory medical care survey and National hospital ambulatory medical care survey
Rodgers 2014[27]	No information on prioritisation, overall experiences of patients
Rowley 2005[28]	Incorrect study design/opinion
Sawyer 2010[29]	Overall experiences of patients/ nothing on prioritisation

Reference	Reason for exclusion
Shaw 2012[30]	No information on prioritisation.
Thornton 2010[31]	Incorrect study design - Berlin questionnaire
Vlachantoni, 2015[32]	No information on prioritisation.
Waldman 2020[33]	No relavant outcomes - no information on prioritisation
West 2017[34]	Incorrect study design - evaluation of patients' history and Epworth scale
Williams 2015[35]	Incorrect study design - Structured questionnaire was used (OSAK questionnaire)
Zarhin 2014[37]	Unavailable thesis
Zarhin 2018[36]	No information on prioritisation.

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