NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Guideline

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

Draft for consultation, March 2021

This guideline covers the diagnosis and management of obstructive sleep apnoea/hypopnea syndrome (OSAHS), obesity hypoventilation syndrome (OHS) and both chronic obstructive pulmonary disease and OSAHS (COPD–OSAHS overlap syndrome). It aims to improve recognition, investigation and management of these related conditions.

Who is it for?

- Healthcare professionals
- Commissioners and providers
- People with OSAHS, OHS and COPD–OSAHS overlap syndrome, their families and carers

What does it include?

- the recommendations
- recommendations for research
- rationale and impact sections that explain why the committee made the recommendations and how they might affect practice.
- the guideline context.

Information about how the guideline was developed is on the guideline's webpage. This includes the evidence reviews, the scope, details of the committee and any declarations of interest.

The recommendations in this guideline were largely developed before the COVID-19 pandemic. However, the committee have considered the impact of the pandemic on managing these conditions and have included some recommendations on particular areas of concern. Please tell us if there are any further issues relating to COVID-19 that we should take into account when finalising the guideline for publication.

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1 Obstructive sleep apnoea/hypopnoea syndrome

People have the right to be involved in discussions and make informed decisions about their care, as described in NICE's information on making decisions about your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

Please note that the following guidance from the Driver and Vehicle Licensing Agency (DVLA) and the UK government is relevant to these recommendations:

- DVLA guidance on assessing fitness to drive: a guide for medical professionals
- DVLA guidance on excessive sleepiness and driving
- UK government guidance on COVID-19: infection prevention and control.

Obstructive sleep apnoea/hypopnoea syndrome (OSHAS) is a condition in which the upper airway is narrowed or closes during sleep when muscles relax, causing under breathing (hypopnoea) or stopping breathing (apnoea). The person wakes or lightens sleep to stop these episodes, which can lead to disrupted sleep and potentially excessive sleepiness.

1.1 Initial assessment for OSAHS

When to suspect OSAHS

1.1.1 Take a sleep history and assess people for OSAHS if they have 2 or more of the following features:

- snoring
- witnessed apnoeas
- unrefreshing sleep
- waking headaches

- unexplained excessive sleepiness, tiredness or fatigue
- nocturia (waking from sleep to urinate)
- choking during sleep
- sleep fragmentation or insomnia
- cognitive dysfunction or memory impairment.

1.1.2 Be aware that there is a higher prevalence of OSAHS in people with any of the following conditions:

- obesity or overweight
- obesity or overweight in pregnancy
- treatment-resistant hypertension
- type 2 diabetes
- cardiac arrythmia, particularly atrial fibrillation
- stroke or transient ischaemic attack
- chronic heart failure
- moderate or severe asthma
- polycystic ovary syndrome
- Down's syndrome
- non-arteritic anterior ischaemic optic neuropathy (sudden loss of vision in 1 eye due to decreased blood flow to the optic nerve)
- acromegaly.

For a short explanation of why the committee made these recommendations see the rationale and impact section on when to suspect OSAHS.

Full details of the evidence and the committee's discussion are in evidence review A: when to suspect OSAHS, OHS and overlap syndrome.

Assessment scales for suspected OSAHS

1.1.3 When assessing people with suspected OSAHS:

- Use the Epworth sleepiness scale in the preliminary assessment of sleepiness.

- Consider using the STOP-Bang questionnaire as well as the Epworth sleepiness scale.

1.1.4 Do not use the Epworth sleepiness scale alone to determine if referral is needed, because not all people with OSAHS have excessive sleepiness.

For a short explanation of why the committee made these recommendations see the rationale and impact section on assessment scales for suspected OSAHS.

Full details of the evidence and the committee's discussion are in evidence review B: assessment scales.

1.2 Prioritising people for rapid assessment by a sleep service

1.2.1 Prioritise people with suspected OSAHS for rapid assessment by a sleep service if any of the following apply:

- they have a vocational driving job
- they have a job for which vigilance is critical for safety
- they have unstable cardiovascular disease, for example poorly controlled arrhythmia, nocturnal angina or treatment-resistant hypertension
- they are pregnant
- they are undergoing preoperative assessment for major surgery
- they have non-arteritic anterior ischaemic optic neuropathy.

1.2.2 When referring people with suspected OSAHS to a sleep service, include the following information in the referral letter to facilitate rapid assessment:

- results of the person's assessment scores
- how sleepiness affects the person
- comorbidities
- occupational risk.

For a short explanation of why the committee made these recommendations see the rationale and impact section on prioritising people for rapid assessment by a sleep service.

Full details of the evidence and the committee's discussion are in evidence review C: prioritisation for further assessment.

1.3 Diagnostic tests for OSAHS

1.3.1 Offer home respiratory polygraphy to people with suspected OSAHS.

1.3.2 Consider hospital respiratory polygraphy for people with suspected OSAHS if home respiratory polygraphy is impractical or additional monitoring is needed.

1.3.3 Be aware that oximetry alone may be inaccurate for diagnosing OSAHS in people with heart failure or chronic lung disease.

1.3.4 Consider polysomnography in people with suspected OSAHS who have a negative respiratory polygraphy result but continue to have symptoms.

1.3.5 Use the results of the sleep study to diagnose OSAHS and determine the severity of OSAHS (mild, moderate or severe).

For a short explanation of why the committee made these recommendations see the rationale and impact section on diagnostic tests for OSAHS.

Full details of the evidence and the committee's discussion are in evidence review D: diagnostic tests.

1.4 Lifestyle advice for all severities of OSAHS

1.4.1 Discuss appropriate lifestyle changes with all people with OSAHS. Provide support and information on losing weight, stopping smoking, reducing alcohol intake and improving sleep hygiene, tailored to the person's needs and in line with the:

- NICE guideline on stop smoking interventions and services

- NICE guideline on preventing excess weight gain
- NICE guideline on obesity: identification, assessment and management (in particular, the section on lifestyle interventions)
- NICE guideline on alcohol-use disorders: prevention (in particular, recommendations on screening, brief advice and extended brief interventions for adults).

For a short explanation of why the committee made this recommendation see the rationale and impact section on lifestyle changes for all severities of OSAHS.

1.5 Treatments for mild OSAHS

Lifestyle advice alone for mild OSAHS

1.5.1 Explain to people with mild OSAHS who have no symptoms or with symptoms that do not affect usual daytime activities that:

- treatment is not usually needed **and**
- changes to lifestyle and sleep habits (see recommendation 1.4.1 on lifestyle advice) can help to prevent OSAHS worsening.

Continuous positive airway pressure for mild OSAHS

The recommendations in this section update NICE's technology appraisal guidance on continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome, recommendation 1.2.

1.5.2 For people with mild OSAHS who have symptoms that affect their quality of life and usual daytime activities, offer fixed-level continuous positive airway pressure (CPAP):

- at the same time as lifestyle advice if they have any of the priority factors listed in recommendation 1.2.1 **or**
- if lifestyle advice alone has been unsuccessful or is considered inappropriate.

1.5.3 For people with mild OSAHS having CPAP:

- Offer telemonitoring with CPAP for up to 12 months.
- Consider using telemonitoring beyond 12 months.

1.5.4 Consider auto-CPAP as an alternative to fixed-level CPAP in people with mild OSAHS who:

- need high pressure only for certain times during sleep **or**
- are unable to tolerate fixed-level CPAP **or**
- are unable to use telemonitoring for technological reasons.

1.5.5 Consider heated humidification for people with mild OSAHS having CPAP who have upper airway side effects, such as nasal and mouth dryness, and CPAP-induced rhinitis.

Reducing the risk of transmission of infection when using CPAP

1.5.6 Be aware that CPAP is an aerosol generating procedure and, if there is a risk of airborne infection, such as COVID-19, appropriate infection control precautions should be taken. These may include setting up the device at home by video consultation or set up with precautions in hospital.

For more information, see the UK government guidance on COVID-19: infection prevention and control and local guidance.

Mandibular advancement splints for mild OSAHS

1.5.7 Consider a customised mandibular advancement splint as an alternative to CPAP in people with mild OSAHS who have symptoms that affect their usual daytime activities if they:

- are aged 18 and over **and**
- have suitable dentition **and**
- are unable to tolerate or decline to try CPAP.

For a short explanation of why the committee made these recommendations see the rationale and impact section on treatments for mild OSAHS.

Full details of the evidence and the committee's discussion are in evidence review E: CPAP therapy for mild OSAHS, evidence review F: different types of positive airway pressure therapy and evidence review G: oral devices.

1.6 Treatments for moderate and severe OSAHS

CPAP for moderate and severe OSAHS

CPAP is recommended as a treatment option for adults with moderate or severe symptomatic OSHAS in NICE technology appraisal guidance on continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome.

1.6.1 Offer fixed-level CPAP, in addition to lifestyle advice, to people with moderate or severe OSAHS.

1.6.2 For people with moderate or severe OSAHS having CPAP:

- Offer telemonitoring with CPAP for up to 12 months.
- Consider using telemonitoring beyond 12 months.

1.6.3 Consider auto-CPAP as an alternative to fixed-level CPAP in people with moderate or severe OSAHS who:

- need high pressure only for certain times during sleep **or**
- are unable to tolerate fixed-level CPAP **or**
- are unable to use telemonitoring for technological reasons.

1.6.4 Consider heated humidification for people with moderate or severe OSAHS having CPAP who have upper airway side effects such as nasal and mouth dryness, and CPAP-induced rhinitis.

Reducing the risk of transmission of infection when using CPAP

1.6.5 Be aware that CPAP is an aerosol generating procedure and, if there is a risk of airborne infection, such as COVID-19, appropriate infection control precautions should be taken. These may include a setting up the device at home by video consultation or set up with precautions in hospital.

For more information, see the UK government guidance on COVID-19: infection prevention and control and local guidance.

Mandibular advancement splints for moderate OSAHS

1.6.6 Consider a customised mandibular advancement splint as an alternative to CPAP in people with moderate OSAHS if they:

- are aged 18 and over **and**
- have suitable dentition **and**
- are unable to tolerate or decline to try CPAP.

For a short explanation of why the committee made these recommendations see the rationale and impact section on treatments for moderate and severe OSAHS.

Full details of the evidence and the committee's discussion are in evidence review F: different types of positive airway pressure therapy and evidence review G: oral devices.

1.7 Further treatment options for OSAHS

Positional modifiers for OSAHS

1.7.1 Consider a positional modifier for people with mild or moderate positional OSAHS if other treatments are unsuitable or not tolerated.

1.7.2 Be aware that positional modifiers are unlikely to be effective in severe OSAHS.

For a short explanation of why the committee made these recommendations see the rationale and impact section on positional modifiers for OSAHS.

Full details of the evidence and the committee's discussion are in evidence review H: positional modifiers.

Surgery for OSAHS

1.7.3 Consider tonsillectomy for people with OSAHS who have large obstructive tonsils and a BMI of less than 35 kg/m^2.

1.7.4 Consider referral for assessment for oropharyngeal surgery in people with severe OSAHS who have been unable to tolerate CPAP and a customised mandibular advancement splint despite medically supervised attempts.

For a short explanation of why the committee made these recommendations see the rationale and impact section on surgery for OSAHS.

Full details of the evidence and the committee's discussion are in evidence review J: upper airway surgery.

1.8 Managing rhinitis in people with OSAHS

1.8.1 Assess people with nasal congestion and OSAHS for underlying allergic or vasomotor rhinitis.

1.8.2 If rhinitis is diagnosed in people with OSAHS, offer initial treatment with:

- topical nasal corticosteroids or antihistamines for allergic rhinitis **or**
- topical nasal corticosteroids for vasomotor rhinitis.

1.8.3 For people with OSAHS and persistent rhinitis, consider referral to an ear, nose and throat specialist if:

- symptoms do not improve with initial treatment **or**
- anatomical obstruction is suspected.

1.8.4 Be aware that:

- rhinitis can affect people's tolerance to CPAP but changing from a nasal to an orofacial mask and adding humidification can help (see recommendation 1.5.4 on heated humidification for mild OSAHS and

recommendation 1.6.3 on heated humidification for moderate and severe OSAHS)

- CPAP can worsen or cause rhinitis and nasal congestion.

For a short explanation of why the committee made these recommendations see the rationale and impact section on managing rhinitis in people with OSAHS.

Full details of the evidence and the committee's discussion are in evidence review K: treating rhinitis.

1.9 Follow-up and monitoring for people with OSAHS

1.9.1 Tailor follow-up to the person's overall treatment plan, which may include lifestyle changes and treating comorbidities. See the recommendations on tailoring healthcare services for each patient in the NICE guideline on patient experience in adult NHS services.

Follow-up for people using CPAP

1.9.2 Offer face-to-face, video or phone consultations, including review of telemonitoring data (if available), to people with OSAHS having CPAP. This should include:

- an initial consultation within 1 month **and**
- subsequent follow-up according to the person's needs and until optimal control of symptoms and apnoea–hypopnoea index (AHI) is achieved.

1.9.3 Once CPAP is optimised, consider annual follow-up for people with OSAHS.

1.9.4 Offer people with OSAHS having CPAP access to a sleep service for advice, support and equipment between follow-up appointments.

Follow-up for people using customised mandibular advancement splints

1.9.5 Offer face-to-face, video or phone consultations, including review of downloads from the device (if available), to people with OSAHS using a mandibular advancement splint. This should include:

- initial follow-up to review adjustment of the device and symptom improvement at 3 months **and**
- subsequent follow-up according to the person's needs and until optimal control of symptoms and AHI is achieved.

Follow-up for people using positional modifiers

1.9.6 Offer face-to-face, video or phone consultations, including review of downloads from the device (if available), to people with OSAHS using a positional modifier. This should include:

- an initial consultation within 3 months **and**
- subsequent follow-up according to the person's needs until optimal control of symptoms and AHI is achieved.

Follow-up for people who have had surgery

1.9.7 Offer people with OSAHS who have had surgery:

- an initial follow-up consultation with respiratory polygraphy within 3 months of the operation **and**
- subsequent follow-up according to the person's needs.

Follow-up for drivers with excessive sleepiness

1.9.8 Ensure follow-up is in line with Driver and Vehicle Licensing Agency guidance on assessing fitness to drive.

For a short explanation of why the committee made these recommendations see the rationale and impact section on follow-up for people with OSAHS.

Full details of the evidence and the committee's discussion are in evidence review L: monitoring.

Monitoring treatment efficacy

1.9.9 Assess the effectiveness of treatment with CPAP, mandibular advancement splints and positional modifiers in people with OSAHS by reviewing the following:

- OSAHS symptoms, including the Epworth sleepiness scale
- severity of OSAHS, using AHI
- adherence to therapy
- telemonitoring data or download information from the device (if available).

1.9.10 Explore with people using CPAP their understanding and experience of treatment, and review the following:

- mask fit, including checking for leaks
- nasal or mouth dryness, and the need for humidification
- other factors affecting sleep disturbance such as insomnia, restless legs and shift work
- sleep hygiene
- cleaning and maintenance of equipment.

For a short explanation of why the committee made these recommendations see the rationale and impact section on monitoring treatment efficacy in people with OSAHS.

Full details of the evidence and the committee's discussion are in evidence review M: demonstration of efficacy.

1.10 Supporting adherence to treatment for OSAHS

1.10.1 Offer people with OSAHS educational or supportive interventions, or a combination of these, tailored to the person's needs and preferences, to improve adherence to CPAP, mandibular advancement splints and positional modifiers.

1.10.2 Interventions to support adherence to treatment for OSAHS should be given by trained specialist staff when treatment is started and as needed at follow-up.

For a short explanation of why the committee made these recommendations see the rationale and impact section on supporting adherence to treatment for OSAHS.

Full details of the evidence and the committee's discussion are in evidence review N: adherence to treatment.

2 Obesity hypoventilation syndrome

Obesity hypoventilation syndrome (OHS) is defined as the combination of obesity (BMI of 30 kg/m^2 or more), raised arterial or arterialised capillary CO_2 level when awake, and breathing abnormalities during sleep, which may consist of obstructive apnoeas and hypopnoeas, or hypoventilation, or a combination of both. OHS is a specific form of chronic ventilatory failure.

2.1 Initial assessment for OHS

When to suspect OHS

2.1.1 Take a sleep history and assess people for OHS if they have a BMI of 30 kg/m^2 or more with:

- features of OSAHS (see recommendation 1.1.1) **or**
- features of nocturnal hypoventilation such as:
  - waking headaches
  - peripheral oedema
  - hypoxaemia (arterial oxygen saturation less than 94% on air)
  - unexplained polycythaemia.

For a short explanation of why the committee made this recommendation see the rationale and impact section on when to suspect OHS.

Full details of the evidence and the committee's discussion are in evidence review A: when to suspect OSAHS, OHS and overlap syndrome.

Assessment scales for suspected OHS

2.1.2 Use the Epworth sleepiness scale in the preliminary assessment of sleepiness in people with suspected OHS.

2.1.3 Do not use the Epworth sleepiness scale alone to determine if referral is needed, because not all people with OHS have excessive sleepiness.

For a short explanation of why the committee made these recommendations see the rationale and impact section on assessment scales for suspected OHS.

Full details of the evidence and the committee's discussion are in evidence review B: assessment scales.

2.2 Prioritising people for rapid assessment by a sleep service

2.2.1 Prioritise people with suspected OHS for rapid assessment by a sleep service if any of the following apply:

- they have severe hypercapnia ($PaCO_2$ over 7.0 kPa when awake)
- they have hypoxaemia (arterial oxygen saturation less than 94% on air)
- they have acute ventilatory failure
- they have a vocational driving job
- they have a job for which vigilance is critical for safety
- they are pregnant
- they have unstable cardiovascular disease, for example poorly controlled arrhythmia, nocturnal angina, heart failure or treatment-resistant hypertension
- they are undergoing preoperative assessment for major surgery
- they have non-arteritic anterior ischaemic optic neuropathy.

2.2.2 When referring people with suspected OHS to a sleep service, include the following information in the referral letter to facilitate rapid assessment:

- results of the person's sleepiness score
- how sleepiness affects the person
- BMI

- comorbidities
- occupational risk
- any history of emergency admissions and acute non-invasive ventilation.

For a short explanation of why the committee made these recommendations see the rationale and impact section on prioritising people for rapid assessment by a sleep service.

Full details of the evidence and the committee's discussion are in evidence review C: prioritisation for referral.

2.3 Diagnostic tests for OHS

Diagnosing OHS and assessing ventilatory failure

2.3.1 Consider measuring serum venous bicarbonate as a preliminary test if the pre-test probability of OHS is low. If bicarbonate levels are below 27 mmol/litre OHS is unlikely.

2.3.2 Measure arterial or arterialised capillary blood gases when the person with suspected OHS is awake to diagnose OHS and assess the extent of chronic ventilatory failure.

2.3.3 Do not delay treatment for acute ventilatory failure to carry out further investigations for OHS.

Diagnosing the presence of OSAHS or nocturnal hypoventilation in people with OHS

2.3.4 Offer respiratory polygraphy, either in hospital or at home, to determine the presence of OSAHS in people with suspected OHS.

2.3.5 Consider adding transcutaneous CO_2 monitoring during sleep to respiratory polygraphy in people with suspected OHS to determine the extent of nocturnal hypoventilation and provide additional information to guide treatment.

2.3.6 Do not use oximetry alone to determine the presence of OSAHS in people with OHS.

For a short explanation of why the committee made these recommendations see the rationale and impact section on diagnostic tests for OHS.

Full details of the evidence and the committee's discussion are in evidence review D: diagnostic tests.

2.4 Lifestyle advice for OHS

2.4.1 Discuss appropriate lifestyle changes with all people with OHS. Provide support and information on losing weight, stopping smoking, reducing alcohol intake and improving sleep hygiene tailored to the person's needs and in line with the:

- NICE guideline on stop smoking interventions and services
- NICE guideline on obesity: identification, assessment and management (in particular, the section on lifestyle interventions)
- NICE guideline on alcohol-use disorders: prevention (in particular, recommendations on screening, brief advice and extended brief interventions for adults).

For a short explanation of why the committee made this recommendation see the rationale and impact section on lifestyle advice for OHS.

2.5 Treatments for OHS

CPAP and non-invasive ventilation

People with OHS who do not have acute ventilatory failure

2.5.1 Offer CPAP to people with OHS and severe OSAHS as first-line treatment.

2.5.2 Offer non-invasive ventilation as an alternative to CPAP for people with OHS and severe OSAHS if symptoms do not improve, hypercapnia

persists, apnoea–hypopnoea index (AHI) is not sufficiently reduced or CPAP is poorly tolerated.

2.5.3 Consider non-invasive ventilation for people with OHS and nocturnal hypoventilation who do not have OSAHS, or in whom OSAHS is not severe.

2.5.4 Consider heated humidification in addition to CPAP for people with OHS and OSAHS and upper airway side effects such as nasal and mouth dryness, and CPAP-induced rhinitis.

People with OHS and acute ventilatory failure

2.5.5 Offer non-invasive ventilation to people with OHS with acute ventilatory failure:

- If hypercapnia persists, consider continuing and further optimising non-invasive ventilation.
- If hypercapnia resolves, consider stopping non-invasive ventilation and monitoring the response.

2.5.6 After a person with OHS and acute ventilatory failure has been stabilised on non-invasive ventilation with control of hypercapnia consider:

- stopping non-invasive ventilation and carrying out respiratory polygraphy **and**
- a trial of CPAP in people with frequent episodes of obstructive apnoea and minimal hypoventilation.

Reducing the risk of transmission of infection when using CPAP or non-invasive ventilation

2.5.7 Be aware that CPAP and non-invasive ventilation are aerosol generating procedures and, if there is a risk of airborne infection, such as COVID-19, appropriate infection control precautions should be taken. These may include setting up the device at home by video consultation or set up with precautions in hospital.

For more information, see the UK government guidance on COVID-19: infection prevention and control and local guidance.

Oxygen therapy

2.5.8 Consider supplemental oxygen therapy with CPAP or non-invasive ventilation for people with OHS who remain hypoxaemic despite optimal control of nocturnal hypoventilation and AHI on CPAP or non-invasive ventilation.

For a short explanation of why the committee made these recommendations see the rationale and impact section on treatments for OHS.

Full details of the evidence and the committee's discussion are in evidence review F: different types of positive airway pressure therapy and evidence review I: supplemental oxygen therapy.

2.6 Managing rhinitis in people with OHS

2.6.1 Assess people with nasal congestion and OHS for underlying allergic or vasomotor rhinitis.

2.6.2 If rhinitis is diagnosed in people with OHS, offer initial treatment with:

- topical nasal corticosteroids or antihistamines for allergic rhinitis **or**
- topical nasal corticosteroids for vasomotor rhinitis.

2.6.3 For people with OHS and persistent rhinitis, consider referral to an ear, nose and throat specialist if:

- symptoms do not improve with initial treatment **or**
- anatomical obstruction is suspected.

2.6.4 Be aware that:

- rhinitis can affect people's tolerance to CPAP and non-invasive ventilation but changing from a nasal to an orofacial mask and adding

humidification can help (see recommendation 2.5.4 on heated humidification for OHS and OSAHS)

- CPAP and non-invasive ventilation can worsen or cause rhinitis and nasal congestion.

For a short explanation of why the committee made these recommendations see the rationale and impact section on managing rhinitis in people with OHS.

Full details of the evidence and the committee's discussion are in evidence review K: treating rhinitis.

2.7 Follow-up and monitoring for people with OHS

2.7.1 Tailor follow-up to the person's overall treatment plan, which may include lifestyle changes and treating comorbidities. See the recommendations on tailoring healthcare services for each patient in the NICE guideline on patient experience in adult NHS services.

Follow-up for people using CPAP or non-invasive ventilation

2.7.2 Offer face-to-face, video or phone consultations, including review of telemonitoring data (if available), to people with OHS having non-invasive ventilation or CPAP. This should include:

- an initial consultation within 1 month **and**
- subsequent follow-up according to the person's needs and until optimal control of symptoms, AHI, oxygenation and hypercapnia is achieved.

2.7.3 When non-invasive ventilation or CPAP (with or without oxygen therapy) has been optimised for people with OHS and their symptoms are controlled, consider 6-monthly to annual follow-up according to the person's needs.

2.7.4 Offer people with OHS having non-invasive ventilation or CPAP access to a sleep and ventilation service for advice, support and equipment between follow-up appointments.

Follow-up for drivers with excessive sleepiness

2.7.5 Ensure follow-up is in line with Driver and Vehicle Licensing Agency guidance on assessing fitness to drive.

For a short explanation of why the committee made these recommendations see the rationale and impact section on follow-up for people with OHS.

Full details of the evidence and the committee's discussion are in evidence review L: monitoring.

Monitoring treatment efficacy for people with OHS

2.7.6 Assess the effectiveness of treatment with CPAP or non-invasive ventilation in people with OHS by reviewing the following:

- OHS symptoms, including the Epworth sleepiness scale
- severity of OSAHS, using AHI
- improvement in oxygenation and hypercapnia while awake and asleep
- adherence to therapy
- telemonitoring or download information from the device (if available).

2.7.7 Explore with the person their understanding and experience of treatment, and review the following:

- mask fit, including checking for leaks
- nasal and mouth dryness, and the need for humidification
- other factors affecting sleep disturbance such as insomnia, restless legs and shift work
- sleep hygiene
- cleaning and maintenance of equipment.

2.7.8 Review the need for oxygen therapy and adherence to this in people with OHS after treatment with non-invasive ventilation or CPAP has been optimised.

For a short explanation of why the committee made these recommendations see the rationale and impact section on monitoring treatment efficacy for people with OHS.

Full details of the evidence and the committee's discussion are in evidence review M: demonstration of efficacy.

2.8 Supporting adherence to treatment for OHS

2.8.1 Offer people with OHS educational or supportive interventions, or a combination of these, tailored to the person's needs and preferences, to improve adherence to CPAP and non-invasive ventilation.

2.8.2 Interventions to support adherence to treatment for OHS should be given by trained specialist staff when treatment is started and as needed at follow-up.

For a short explanation of why the committee made these recommendations see the rationale and impact section on supporting adherence to treatment for OHS.

Full details of the evidence and the committee's discussion are in evidence review N: adherence to treatment.

3 COPD–OSAHS overlap syndrome

COPD–OSAHS overlap syndrome occurs in people who have both chronic obstructive pulmonary disease (COPD) and obstructive sleep apnoea/hypopnoea syndrome (OSAHS). The combined effect of these conditions on ventilatory load, gas exchange, comorbidities and quality of life is greater than either condition alone.

Recommendations in this guideline cover assessment and treatment of OSAHS in people with COPD. For recommendations on the diagnosis and management of COPD see the NICE guidelines on chronic obstructive pulmonary disease in over 16s and chronic obstructive pulmonary disease (acute exacerbation): antimicrobial prescribing. See also NICE's guideline on community-based care of patients with COPD during the COVID-19 pandemic.

3.1 Initial assessment for COPD–OSAHS overlap syndrome

When to suspect COPD–OSAHS overlap syndrome

3.1.1 Take a sleep history and assess people for COPD–OSAHS overlap syndrome if they have confirmed COPD with:

- features of OSAHS (see recommendation 1.1.1) **or**
- features of nocturnal hypoventilation such as:
  - waking headaches
  - peripheral oedema
  - hypoxaemia (arterial oxygen saturation less than 94% on air)
  - unexplained polycythaemia.

For a short explanation of why the committee made this recommendation see the rationale and impact section on when to suspect COPD–OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review A: when to suspect OSAHS, OHS and overlap syndrome .

Assessment scales and tests for suspected COPD–OSAHS overlap syndrome

3.1.2 When assessing people with suspected COPD–OSAHS overlap syndrome:

- Use the Epworth sleepiness scale in the preliminary assessment of sleepiness
- Consider using the STOP-Bang questionnaire, as well as the Epworth sleepiness scale.

3.1.3 Do not use the Epworth sleepiness scale alone to determine if referral is needed, because not all people with overlap syndrome have excessive sleepiness.

3.1.4 Offer spirometry to assess the severity of COPD in people with suspected COPD–OSAHS overlap syndrome (see recommendations on spirometry in NICE's guideline on chronic obstructive pulmonary disease in over 16s).

Reducing the risk of transmission of infection when using spirometry

3.1.5 Be aware that spirometry is an aerosol generating procedure and, if there is a risk of airborne infection, such as COVID-19, appropriate infection control precautions should be taken.

For more information, see the UK government guidance on COVID-19: infection prevention and control and local guidance.

For a short explanation of why the committee made this recommendation see the rationale and impact section on assessment scales and tests for suspected COPD-OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review B: assessment scales.

3.2 Prioritising people for rapid assessment by a sleep service

3.2.1 Prioritise people with suspected COPD–OSAHS overlap syndrome for rapid assessment by a sleep service if any of the following apply:

- they have severe hypercapnia ($PaCO_2$ over 7.0 kPa when awake)
- they have hypoxaemia (arterial oxygen saturation less than 94% on air)
- they have acute ventilatory failure
- they have a vocational driving job
- they have a job for which vigilance is critical for safety
- they are pregnant
- they have unstable cardiovascular disease, for example poorly controlled arrhythmia, nocturnal angina, heart failure or treatment-resistant hypertension
- they are undergoing preoperative assessment for major surgery

- they have non-arteritic anterior ischaemic optic neuropathy.

3.2.2 When referring people with suspected COPD–OSAHS overlap syndrome to a sleep service, include the following information in the referral letter to facilitate rapid assessment:

- results of the person's sleepiness score
- how sleepiness affects the person
- BMI
- severity and frequency of exacerbations of COPD
- use of oxygen therapy at home
- comorbidities
- occupational risk
- any history of acute non-invasive ventilation.

For a short explanation of why the committee made this recommendation see the rationale and impact section on prioritising people for rapid assessment by a sleep service.

Full details of the evidence and the committee's discussion are in evidence review C: prioritisation.

3.3 Diagnostic tests for COPD–OSAHS overlap syndrome

Diagnosing ventilatory failure

3.3.1 Measure arterial or arterialised capillary blood gas when the person with suspected COPD–OSAHS overlap syndrome is awake to assess for ventilatory failure.

3.3.2 Do not delay treatment for acute ventilatory failure to carry out further investigations for COPD–OSAHS overlap syndrome.

Diagnosing OSAHS or nocturnal hypoventilation in people with suspected COPD–OSAHS overlap syndrome

3.3.3 Offer respiratory polygraphy, either in hospital or at home, to diagnose OSAHS in people with suspected COPD–OSAHS overlap syndrome.

3.3.4 Consider adding transcutaneous CO_2 monitoring during sleep to respiratory polygraphy to provide additional information to guide treatment.

3.3.5 Do not use oximetry alone to diagnose OSAHS or nocturnal hypoventilation in people with suspected COPD–OSAHS overlap syndrome.

For a short explanation of why the committee made this recommendation see the rationale and impact section on diagnostic tests for COPD–OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review D: diagnostic tests.

3.4 Lifestyle advice for COPD–OSAHS overlap syndrome

3.4.1 For people with COPD–OSAHS overlap syndrome, follow recommendation 1.4.1 on lifestyle advice for people with OSAHS. Prioritise advice on stopping smoking and follow the recommendations on smoking cessation in NICE's guideline on chronic obstructive pulmonary disease in over 16s.

3.5 Treatments for COPD–OSAHS overlap syndrome

CPAP and non-invasive ventilation

3.5.1 Consider CPAP as first-line treatment for people with COPD–OSAHS overlap syndrome if they do not have severe hypercapnia ($PaCO_2$ of 7.0 kPa or less).

3.5.2 Consider non-invasive ventilation instead of CPAP for people with COPD–OSAHS overlap syndrome if they have severe hypercapnia ($PaCO_2$ greater than 7.0 kPa).

3.5.3 Consider heated humidification in addition to CPAP for people with OSAHS and upper airway side effects such as nasal and mouth dryness, and CPAP-induced rhinitis.

Reducing the risk of transmission of infection when using CPAP or non-invasive ventilation

3.5.4 Be aware that CPAP and non-invasive ventilation are aerosol generating procedures and, if there is a risk of airborne infection, such as COVID-19, appropriate infection control precautions should be taken. These may include setting up the device at home by video consultation or set up with precautions in hospital.

For more information, see NICE's guideline on community-based care of patients with COPD during the COVID-19 pandemic, the UK government guidance on COVID-19: infection prevention and control and local guidance.

Oxygen therapy

3.5.5 Consider supplemental oxygen for people with COPD–OSAHS overlap syndrome if hypoxaemia persists once control of apnoea and nocturnal hypoventilation has been optimised by CPAP or non-invasive ventilation.

For a short explanation of why the committee made these recommendations see the rationale and impact section on treatments for COPD–OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review F: different types of positive airway pressure therapy and evidence review I: supplemental oxygen therapy.

3.6 Managing rhinitis in people with COPD–OSAHS overlap syndrome

3.6.1 For people with COPD–OSAHS overlap syndrome, follow the recommendations on managing rhinitis in people with OSAHS.

3.7 Follow-up and monitoring for people with COPD–OSAHS overlap syndrome

3.7.1 Tailor follow-up to the person's overall treatment plan, which may include lifestyle changes and treating comorbidities. It may also include discussions about care planning (for example, COPD exacerbation action plan and advance care planning) for those with severe COPD. See the recommendations on self management in the NICE guideline on chronic obstructive pulmonary disease in over 16s and tailoring healthcare services for each patient in the NICE guideline on patient experience in adult NHS services.

Follow-up for people using CPAP or non-invasive ventilation

3.7.2 Offer face-to-face, video or phone consultations, including review of telemonitoring data (if available), to people with COPD–OSAHS overlap syndrome having non-invasive ventilation or CPAP. This should include:

- an initial consultation within 1 month **and**
- subsequent follow-up according to the person's needs and until optimal control of symptoms, apnoea–hypopnoea index (AHI), oxygenation and hypercapnia is achieved.

3.7.3 When non-invasive ventilation or CPAP (with or without oxygen therapy) has been optimised for people with COPD–OSAHS overlap syndrome and their symptoms are controlled, consider 6-monthly to annual follow-up according to the person's needs.

3.7.4 Offer people with COPD–OSAHS overlap syndrome having non-invasive ventilation or CPAP access to a sleep and ventilation service for advice, support and equipment between follow-up appointments.

Follow-up for drivers with excessive sleepiness

3.7.5 Ensure follow-up is in line with Driver and Vehicle Licensing Agency guidance on assessing fitness to drive.

For a short explanation of why the committee made these recommendations see the rationale and impact section on follow-up for people with COPD-OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review L: monitoring.

Monitoring treatment efficacy for people with COPD–OSAHS overlap syndrome

3.7.6 Assess the effectiveness of treatment with CPAP or non-invasive ventilation in people with COPD–OSAHS overlap syndrome by reviewing the following:

- symptoms of OSAHS and nocturnal hypoventilation, including the Epworth sleepiness scale
- severity of OSAHS, using AHI
- improvement in oxygenation and hypercapnia while awake and asleep
- adherence to therapy
- telemonitoring or download information from the device (if available).

3.7.7 Explore with the person their understanding and experience of treatment, and review the following:

- mask fit, including checking for leaks
- nasal and mouth dryness, and need for humidification
- other factors affecting sleep disturbance such as insomnia, restless legs and shift work
- sleep hygiene
- cleaning and maintenance of equipment.

3.7.8 Be aware that some symptoms associated with COPD such as cough and wheeze, and certain medications such as theophyllines, may adversely affect sleep quality.

3.7.9 Review the need for oxygen therapy in people with COPD–OSAHS overlap syndrome who are having supplemental oxygen therapy, after treatment with non-invasive ventilation or CPAP has been optimised.

3.7.10 Consider stopping CPAP or non-invasive ventilation and using a symptom-management approach with people with COPD–OSAHS overlap syndrome who have severe COPD if, despite treatment optimisation, CPAP or non-invasive ventilation does not improve their symptoms or quality of life or adds to the burden of therapy.

For a short explanation of why the committee made these recommendations see the rationale and impact section on monitoring treatment efficacy for people with COPD–OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review M: demonstration of efficacy.

3.8 Supporting adherence to treatment for COPD–OSAHS overlap syndrome

3.8.1 Offer people with COPD–OSAHS overlap syndrome educational or supportive interventions, or a combination of these, tailored to the person's needs and preferences, to improve adherence to CPAP and non-invasive ventilation.

3.8.2 Interventions to support adherence to treatment for COPD–OSAHS overlap syndrome should be given by trained specialist staff when treatment is started and as needed at follow-up.

For a short explanation of why the committee made these recommendations see the rationale and impact section on supporting adherence to treatment for COPD–OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review N: adherence to treatment.

4 Information for people with OSAHS, OHS or COPD–OSAHS overlap syndrome

4.1.1 For people with suspected OSAHS, OHS or COPD–OSAHS overlap syndrome who are being referred to a sleep service, provide information on:

- the underlying causes of their condition
- what sleep studies involve
- why treatment is important
- what treatments are available
- the impact of excessive sleepiness on safe driving and occupational risk
- the Driver and Vehicle Licensing Agency guidance on excessive sleepiness and driving and when there is a legal requirement for the person to notify the DVLA of their condition
- lifestyle changes, including weight loss, increasing physical activity, and avoiding alcohol excess and sedatives before sleep
- other sources of patient support.

4.1.2 For people who have been diagnosed with OSAHS, OHS or COPD–OSAHS overlap syndrome, repeat the information provided at referral (see recommendation 4.1.1) and give additional information on:

- choosing the best treatment for the person
- the practicalities of travel.

4.1.3 For people starting treatment with CPAP or non-invasive ventilation, provide information on:

- why it is used and how it works
- the benefits of continuing with treatment and advice on encouraging adherence
- how to get support for technical and clinical problems, and obtain replacement masks and other parts
- different masks or other interface options and how to manage problems with masks
- how often to expect follow-up appointments
- how to clean and maintain their equipment
- taking short breaks from treatment
- making arrangements for travelling with CPAP or non-invasive ventilation.

4.1.4 Advise people using CPAP and non-invasive ventilation that these are aerosol generating procedures and they should take appropriate precautions if there is a risk that they may have an airborne infection such as COVID-19.

For more information, see the UK government guidance on COVID-19: infection prevention and control and local guidance.

4.1.5 For people starting treatment with a mandibular advancement splint, provide information on:

- possible short-term side effects, such as mild discomfort, hypersalivation and altered bite
- possible long-term side effects, such as problems with dental occlusion
- adjusting the device to ensure maximum benefit
- how to clean and maintain the device
- maintaining good oral health
- who to contact for help with problems, for example, if the device breaks or the fit becomes poor

- how often to expect follow-up appointments.

For a short explanation of why the committee made these recommendations see the rationale and impact section on information for people with OSAHS, OHS and COPD-OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review O: information and support.

Terms used in this guideline

This section defines terms that have been used in a particular way for this guideline.

Apnoea

A complete pause in breathing, defined as lasting 10 seconds or more on a sleep study. An obstructive apnoea is caused by blockage of the upper airway, whereas a central apnoea occurs when there is no respiratory effort.

Apnoea-hypopnoea index (AHI)

The number of apnoeas and hypopnoeas per hour, measured during a multi-channel sleep study.

Hypopnoea

A reduction in breathing, defined as lasting for 10 seconds or more on a sleep study. An obstructive hypopnoea is caused by partial obstruction of the upper airway.

Mandibular advancement split

An oral device used to treat sleep-related breathing disorders. It is worn over the upper and lower teeth, and holds the lower jaw forward, thereby increasing space at the back of the mouth and decreasing snoring and sleep apnoea. A custom-made mandibular advancement splint is fitted by a suitably trained general dental practitioner.

Nocturnal hypoventilation

Decreased breathing or under breathing during sleep, which can lead to varying severities of ventilatory failure (low oxygen levels and raised carbon dioxide). It can be caused by obesity, underlying lung disease, neuromuscular weakness and some medications such as opiates. Severe hypercapnia can be caused by nocturnal hypoventilation.

Positional modifier

An intervention to encourage patients not to sleep on their backs.

Positional OSAHS

A type of OSAHS that is affected by the person's sleep position. People with positional OSAHS have an apnoea-hypopnea index (AHI) at least twice as high when lying face up (supine) as lying on their side (laterally).

Severity of OSAHS

This is determined using the AHI value, as follows:

- Mild OSAHS: AHI of 5 or more to less than 15
- Moderate OSAHS: AHI of 15 or more to less than 30
- Severe OSAHS: AHI of 30 or more.

Sleep study

A test used to diagnose sleep disorders by recording multiple channels during sleep, such as brain activity, breathing rate, blood oxygen level, heart rate, and eye and leg movements. There are several different types of sleep study:

- oximetry measures arterial oxygen saturation and heart rate while the person is asleep
- respiratory polygraphy includes at least 4 channels such as oximetry, breathing rate, apnoeas and hyponoeas, snoring and body position
- polysomnography, which is more detailed and includes respiratory polygraphy measures combined with assessment of sleep quality and duration using additional brain activity, eye movement and muscle tone signals.

Telemonitoring

The use of information and communication technologies to monitor patients remotely and transmit data related to their health. It is used to provide information including respiratory events, pressure requirements, mask leak and adherence.

Recommendations for research

The guideline committee has made the following recommendations for research.

Key recommendations for research

1 Interventions to improve CPAP adherence

Which interventions, including behavioural interventions, are most clinically and cost effective to improve adherence to CPAP in people with OSAHS, OHS and COPD–OSAHS overlap syndrome who have difficulty using CPAP?

For a short explanation of why the committee made this recommendation see the rationale section on supporting adherence to treatment for OSAHS.

Full details of the evidence and the committee's discussion are in evidence review N: adherence to treatment.

2 Mandibular advancement splints for mild symptomatic OSAHS and moderate OSAHS

In mild symptomatic OSAHS and moderate OSAHS, which clinical and physiological phenotypes predict treatment response to customised mandibular advancement splints?

For a short explanation of why the committee made this recommendation see the rationale section on treatments for mild OSAHS.

Full details of the evidence and the committee's discussion are in evidence review G: oral devices.

3 Oxygen therapy for OSAHS

What is the clinical and cost effectiveness of nocturnal oxygen compared with placebo in people with OSAHS unable to tolerate CPAP?

For a short explanation of why the committee made this recommendation see the rationale section on oxygen therapy for OSAHS.

Full details of the evidence and the committee's discussion are in evidence review I: supplemental oxygen therapy.

4 Mandibular advancement splints for severe OSAHS

What is the clinical and cost effectiveness of mandibular advancement splints for managing severe OSAHS?

For a short explanation of why the committee made this recommendation see the rationale section on treatments for moderate and severe OSAHS.

Full details of the evidence and the committee's discussion are in evidence review G: oral devices.

5 Treatment for people with COPD–OSAHS overlap syndrome

What is the optimal treatment for people with COPD–OSAHS overlap syndrome – non-invasive ventilation or CPAP?

For a short explanation of why the committee made this recommendation see the rationale section on treatments for COPD-OSAHS overlap syndrome.

Full details of the evidence and the committee's discussion are in evidence review F: different types of positive airway pressure therapy.

Other recommendations for research

Upper airway surgery in people unable to tolerate or adhere to CPAP

What is the clinical and cost effectiveness of upper airway surgical interventions for people with OSAHS who are unable to tolerate or adhere to CPAP?

For a short explanation of why the committee made this recommendation see the rationale section on surgery for OSAHS.

Full details of the evidence and the committee's discussion are in evidence review J: upper airway surgery.

Rationale and impact

These sections briefly explain why the committee made the recommendations and how they might affect practice.

When to suspect OSAHS

Recommendations 1.1.1 and 1.1.2

Why the committee made the recommendations

There was limited evidence for identifying who to assess for OSAHS, so the committee also used their clinical knowledge and experience to make the recommendations.

The committee agreed that, after taking a sleep history, further assessment for OSAHS should be carried out in people presenting with common symptoms and features of OSAHS, such as unexplained excessive sleepiness, snoring, apnoeas observed during sleep and choking during sleep, but that a broader range of symptoms should also be recognised, such as sleep fragmentation, insomnia, and fatigue in people without excessive sleepiness. The committee agreed that a single symptom alone, such as snoring, is not sufficient for further investigation and that 2 or more features should be identified to warrant assessment. Based on evidence and experience, the committee listed conditions associated with OSAHS that should alert healthcare professionals to the possibility of OSAHS.

How the recommendations might affect practice

The recommendations aim to raise awareness of symptoms and associated conditions that should raise suspicion of OSAHS, as well as prompting assessment. This could increase the number of people being assessed and referred to sleep services.

Return to recommendations

Assessment scales for suspected OSAHS

Recommendations 1.1.3 and 1.1.4

Why the committee made the recommendations

The Epworth sleepiness scale is intended to assess for sleepiness rather than to diagnose OSAHS, and the limited evidence reflected this, showing that it performed poorly both for sensitivity and specificity in diagnosing OSAHS. The committee noted that some people with OSAHS do not have excessive sleepiness and that not all healthcare professionals are aware of this. However, they agreed that it has a useful role in assessment and monitoring, and noted that when healthcare professionals are requested by the DVLA to complete assessment of a driver with OSAHS this includes the Epworth sleepiness scale. They therefore agreed that it should be used, but not as the sole means of assessing the presence of OSAHS or sole basis for referral.

Limited evidence showed that the STOP-Bang questionnaire had high sensitivity and low specificity for diagnosing OSAHS. Sensitivity is a priority for questionnaires used for initial assessment. The committee had some concerns about its accuracy in people with less common presentations and in women, but agreed that it could have a role in assessment alongside the Epworth sleepiness scale to inform the preliminary understanding of the persons' symptoms and concerns. The Epworth questionnaire is used to assess only sleepiness whereas STOP-Bang questionnaire is used to assess risk of having OSAHS and includes parameters such as: snoring, tiredness, history of high blood pressure, BMI, age, neck size and gender. With this in mind the committee recommended using the Epworth questionnaire and to consider using the STOP-Bang questionnaire.

How the recommendations might affect practice

The recommended questionnaires are widely used in current practice, so the recommendations are not expected to involve a change in practice.

Return to recommendations

Prioritising people for rapid assessment by a sleep service

Recommendations 1.2.1 and 1.2.2

Why the committee made the recommendations

There was limited evidence available on who to prioritise for referral, and the committee noted that service provision and waiting times vary across sleep services and regions in England. Therefore, the committee used their knowledge and experience to identify groups that would benefit most from prompt assessment and treatment.

The committee agreed that priority access to a sleep study and treatment should be offered to people in whom vigilance and alertness are vital to occupational safety, particularly those with problematic sleepiness, and to people with pre-existing conditions who are at increased risk of adverse events.

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. The committee noted that Driver and Vehicle Licensing Agency guidance on assessing fitness to drive 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 need assessment and treatment from a sleep specialist.

The committee 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 agreed that priority should be given to pregnant women because OSAHS in pregnancy is associated with increased risks for the mother and baby.

The committee agreed that people with a high probability of OSAHS who need major surgery should be prioritised to avoid delaying surgery.

The committee also agreed that the risk of sudden blindness in patients with non-arteritic anterior ischaemic optic neuropathy warrants urgent referral because of its possible association with OSAHS.

To ensure that people are prioritised appropriately by sleep services and to allow fast-tracking directly to a sleep study the committee agreed on key details, based on their experience, that should be included in referral letters.

How the recommendations might affect practice

In current practice, specific groups are not always prioritised for referral, so there is likely to be 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 for and providing 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.

Return to recommendations

Diagnostic tests for OSAHS

Recommendations 1.3.1 to 1.3.5

Why the committee made the recommendations

The evidence on diagnostic tests for OSAHS was not consistent. The studies reviewed looked at diagnostic devices with a variety of monitoring channels and included different patient groups. The committee also noted that diagnostic equipment has evolved and improved over time. The committee used their clinical knowledge and experience supported by the published evidence and by the economic model developed for this guideline to make the recommendations.

Home respiratory polygraphy was more cost effective than both hospital (inpatient) respiratory polygraphy and home oximetry. The committee noted that respiratory polygraphy has the added benefit of aiding the diagnosis of other conditions such as

central sleep apnoea and nocturnal hypoventilation and it is better than oximetry alone in identifying artefacts in the recordings.

Hospital respiratory polygraphy was the next most cost-effective strategy. This may sometimes be needed when investigating alternative diagnoses alongside OSAHS, because extra monitoring channels can be used. It might also be an option if home respiratory polygraphy is impractical, for example for people who need help with the monitoring equipment, or need to travel long distances to pick up and return devices, or when a number of inpatient investigations need to be combined.

The use of oximetry alone, or oximetry followed by home respiratory polygraphy if initial oximetry is negative, was less cost effective than these other options. Oximetry may be particularly inaccurate in people with conditions such as heart failure or chronic lung disease, which can result in desaturation without the presence of OSAHS. In addition, oximetry cannot reliably distinguish between obstructive or central apnoeas and nocturnal hypoventilation, which is important to help determine treatment. However, diagnostic strategies incorporating oximetry are still used, for example by services with limited availability of home polygraphy equipment. The committee recognised that it might take time to change practice, and noted that when suspicion of OSAHS is low normal oximetry provides further evidence against the diagnosis. Therefore they did not think it appropriate to recommend definitively against its use, but agreed that it was important to highlight the potential problems of reliance on oximetry.

The committee agreed that further investigation with polysomnography, which is more accurate and more expensive than respiratory polygraphy, should be an option to provide more detail on sleep fragmentation and respiratory events for people with symptoms of OSAHS who have a negative respiratory polygraphy result but continue to have suggestive symptoms. This may help distinguish between OSAHS and other disorders such as narcolepsy, REM sleep behaviour disorder, periodic limb movement disorders, idiopathic hypersomnolence or parasomnias which are suspected as a more likely diagnosis for the person’s symptoms, or help diagnose these disorders when they are suspected in addition to OSAHS.

How the recommendations might affect practice

Current practice is variable, with some sleep services offering oximetry as the first-line test and others offering home respiratory polygraphy. The recommendations will reduce this variation. Some services will need to provide more home respiratory equipment and less home oximetry but this should lead to fewer repeat tests and optimal treatment.

The use of polysomnography for those who still have symptoms despite negative respiratory polygraphy results reflects current practice for this small population.

Return to recommendations

Lifestyle advice for all severities of OSAHS

Recommendation 1.4.1

Why the committee made the recommendation

Evidence for lifestyle advice was not reviewed because it is covered by other NICE guidelines.

The committee agreed that all people with OSAHS should discuss lifestyle changes with their healthcare professional. This should be tailored to the person's needs and the chosen treatment method. It may include advice on weight loss, preventing excess weight gain, stopping smoking and reducing alcohol intake, as appropriate.

Lifestyle changes are important because obesity increases the prevalence and severity of OSAHS, smoking causes upper airway inflammation, which can exacerbate symptoms, and excess alcohol before sleep reduces upper airway tone, increasing apnoeas, and reduces sleep quality. Advice on sleep hygiene may include ensuring adequate sleep time, avoiding caffeine and stimulants that interfere with sleep before bedtime, exercising regularly, having a quiet, comfortable, darkened bedroom, and winding down before sleep.

Return to recommendation

Treatments for mild OSAHS

Recommendations 1.5.1 to 1.5.7

Why the committee made the recommendations

Lifestyle advice alone

From their experience the committee agreed that for many people with mild OSAHS who have no symptoms or symptoms that do not affect usual daytime activites, lifestyle changes alone can prevent OSAHS worsening and improve their quality of life. Lifestyle and sleep hygiene advice should be tailored to the person's circumstances. The committee noted that people without symptoms may come to the attention of a specialist because their partner has witnessed apnoeas and overt snoring.

Continuous positive airway pressure (CPAP)

For people with mild OSAHS whose symptoms affect their quality of life and usual daytime activities, the evidence suggested that CPAP was more clinically and cost effective than conservative management (including lifestyle changes and sleep hygiene). However, the quality of the evidence means that there is some uncertainty about the cost effectiveness. CPAP was found to be beneficial in improving sleepiness, fatigue, vitality and quality of life, which confirmed the committee's experience that there are benefits to giving CPAP to people with symptomatic mild OSAHS. While some people could try lifestyle modification first, they noted that these changes take time to work and may not always be effective.

Delaying offering CPAP to people with any of the priority factors listed in recommendation 1.2.1 could adversely affect quality of life, associated medical conditions, or the person's ability to carry out their work, by failing to control their symptoms. The committee agreed that in their experience offering CPAP to these groups helped control their symptoms and reduced the risks described in the rationale section for prioritising people for rapid assessment by a sleep service. Therefore, the committee agreed that for these people, CPAP should be offered as a first-line treatment alongside lifestyle changes, as soon as mild OSAHS is diagnosed. They also agreed that CPAP would be beneficial to control symptoms in people for whom lifestyle changes alone are unsuccessful or are not appropriate.

The committee also discussed the benefits of telemonitoring, described in more detail in the rationale section on follow-up for people with OSAHS. They agreed that

the costs varied between sleep centres and, in the committee's experience, telemonitoring is included in the price of the machine for 12 months. Based on this, the committee recommended it should be offered alongside CPAP for up to 12 months, and considered beyond 12 months if optimal control of symptoms and AHI has not been achieved, or to help with solving problems that people with OSAHS might experience.

Telemonitoring has allowed remote assessment of patients during the coronavirus pandemic and has become a standard follow-up option in most sleep services. This use is likely to continue long term, because it is convenient for patients, enables them to assess progress themselves and allows access to efficacy and adherence data whenever needed, for example for problem solving, routine follow-up and to complete DVLA reports.

The evidence showed fixed-level CPAP and auto-CPAP to be equally effective, and auto-CPAP to be more costly. Therefore, the committee agreed to recommend fixed-level CPAP as the first-choice treatment. However, some people, particularly those in whom high pressures are only needed part of the time, find auto-CPAP more comfortable and effective than fixed-level CPAP. For others, telemonitoring may not be possible because of technological constraints such as the lack of availability of internet or poor internet connection. The committee agreed that auto-CPAP should be available in these cases. The committee were also aware that some hospitals get significant discount on auto-CPAP devices and that this might make them cost effective.

Based on their experience of current practice, the committee agreed that using humidification with CPAP in people with nasal symptoms can reduce side effects associated with upper airway dryness and this may improve adherence and treatment effectiveness.

Mandibular advancement splints

There was very little evidence for non-customised oral devices in people with mild OSAHS. Most of the evidence was for customised mandibular advancement splints and no evidence was found for tongue-retaining devices or tongue-stabilising devices. One study showed little benefit of mandibular advancement splints

compared with no treatment in people with mild symptomatic OSAHS, but the committee agreed that the duration of the study was not sufficient for the true benefit to be assessed. Indirect evidence from studies in people with moderate OSAHS did show clinical benefit compared with placebo, and also showed better ease of use and patient preference scores than for CPAP.

An economic analysis showed that CPAP was slightly more cost effective than customised mandibular advancement splints but the committee agreed the difference was small and they did not want to exclude these devices as an option, bearing in mind that some people find CPAP unacceptable. Based on this and their experience, the committee agreed that mandibular advancement splints should be considered as a treatment for people with mild OSAHS who have symptoms that affect their usual daytime activities if they are unable to tolerate or decline to try CPAP, or have mild symptoms such as insomnia or sleep fragmentation.

The evidence was unclear about the best type of mandibular advancement splint, but from their experience, the committee agreed that devices that are custom made and fitted by a suitably trained dentist are superior to semi-customised and ready-made (also called 'boil and bite') splints. Despite higher initial costs to make and fit, customised devices are more durable and longer lasting than the other devices, and they were shown to be more cost effective. They are also preferred by patients. Ready-made or semi-customised devices may be inappropriate for people with missing teeth or poor dentition and for people with generalised tonic-clonic seizures. Mandibular advancement splints are not suitable for people under 18 because they may adversely affect development of dentition.

The committee observed that careful patient selection is vital and further research is needed to determine which patients with mild OSAHS would benefit most from mandibular advancement splint therapy. They developed a research recommendation on treating mild OSAHS with a mandibular advancement splint to inform future guidance.

How the recommendations might affect practice

Some people with mild OSAHS currently use CPAP, for example people with symptoms that affect their ability to do daily activities, and when other treatment

options and lifestyle advice have been unsuccessful or are considered inappropriate. It is expected that there will be increased uptake of CPAP for mild OSAHS, and therefore a resource increase to the NHS from this recommendation especially as the estimate of prevalence of mild OSAHS has increased, and more patients are referred and diagnosed. For sleep services currently using auto-CPAP as the first-choice treatment, switching to fixed-level CPAP for new patients starting CPAP would be expected to be cost saving.

Some people with mild OSAHS currently use mandibular advancement splints. Many of these will be using less effective ready-made devices that they will have bought themselves. It is expected that there will be increased uptake of customised mandibular advancement splints and therefore a resource increase from this recommendation. NHS provision of dental services producing mandibular advancement splints is currently limited. Mandibular advancement splints need replacing at regular intervals and people using them need follow-up to assess efficacy.

Return to recommendations

Treatments for moderate and severe OSAHS

Recommendations 1.6.1 to 1.6.6

Why the committee made the recommendations

CPAP for moderate and severe OSAHS

The NICE technology appraisal guidance on continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome recommends CPAP as a treatment option for moderate and severe OSAHS.

The committee discussed the benefits of telemonitoring, described in more detail in the rationale section on follow-up for people with OSAHS. They agreed that the costs varied between sleep centres and, in the committee's experience, telemonitoring is included in the price of the machine for 12 months. Based on this they recommend it should be offered alongside CPAP for up to 12 months, and considered beyond

12 months if optimal control of symptoms and AHI has not been achieved, or to help with solving problems that people with OSAHS might experience.

Telemonitoring has allowed remote assessment of patients during the coronavirus pandemic and has become a standard follow-up option in most sleep services. This use is likely to continue long term, because it is convenient for patients, enables them to assess progress themselves and allows access to efficacy and adherence data whenever needed, for example for problem solving, routine follow-up and to complete DVLA reports.

The evidence showed fixed-level CPAP and auto-CPAP to be equally effective, and auto-CPAP to be more costly. Therefore the committee agreed to recommend fixed-level CPAP as the first-choice treatment. However, some people, particularly those in whom high pressures are only needed part of the time, find auto-CPAP more comfortable and effective than fixed-level CPAP. For others, telemonitoring may not be possible because of technological constraints such as the lack of availability of internet or poor internet connection. The committee agreed that auto-CPAP should be available in these cases. The committee were also aware that some hospitals get significant discount on auto-CPAP devices and that this might make them cost effective.

Based on its experience of current practice, the committee agreed that using humidification with CPAP may reduce side effects causing upper airway symptoms and subsequently improve adherence and treatment effectiveness.

Mandibular advancement splints for moderate OSAHS

Although CPAP is the treatment of choice for people with moderate and or severe OSAHS, some people are unable to tolerate it in any form. The evidence showed that mandibular advancement splints are of benefit to people with moderate OSAHS and the committee agreed that they should consider an alternative treatment if CPAP is not tolerated, or people decide not try it. There was a lack of evidence for mandibular advancement splints in people with severe OSAHS and the committee were not able to make a consensus recommendation for this population. Therefore, the committee made a research recommendation on mandibular advancement splints for severe OSAHS.

The evidence was unclear about the best type of mandibular advancement splint, but from their experience, the committee agreed that devices that are custom made and fitted by a suitably trained dentist are superior to semi-customised and ready-made (also called 'boil and bite') splints. Despite higher initial costs to make and fit, customised devices are more durable and longer lasting than the other devices, and they were shown to be more cost effective. They are also preferred by patients. Ready-made or semi-customised devices may be inappropriate for people with missing teeth or poor dentition and for people with generalised tonic-clonic seizures. Mandibular advancement splints are not suitable for children and young people under 18 because they may adversely affect development of dentition.

How the recommendations might affect practice

The recommendations for CPAP reflect current practice in most sleep services. In those currently using auto-CPAP as the first-choice treatment, switching to fixed-level CPAP for new patients starting CPAP would be expected to be cost saving.

It is expected that there will be increased uptake of customised mandibular advancement splints and therefore a resource increase from this recommendation. Mandibular advancement splints need replacing at regular intervals and people using them need follow-up to assess efficacy and dentition.

Return to recommendations

Positional modifiers for OSAHS

Recommendations 1.7.1 and 1.7.2

Why the committee made the recommendations

There was limited evidence on positional modifiers to treat OSAHS and the available studies were small with limited follow-up. The committee agreed that the evidence did not support their use as a first-choice treatment over CPAP and mandibular advancement splints in patients with mild or moderate positional OSAHS. However, there was some evidence of a reduction of OSAHS severity in supine sleep and an associated fall in the number of apnoeas compared with no treatment, with no evidence of adverse effects, so the committee agreed that they could be an option if other treatments were unsuccessful or not tolerated. It is estimated that more than

half of people with OSAHS have positional OSAHS, so this recommendation will give more choice and offer an alternative option for the many people who find CPAP and mandibular advancement splints difficult to tolerate or unsuitable.

The committee did not support the use of positional modifiers in people with severe OSAHS, because these people usually continue to have obstructive events even when lying on their side. The committee were also aware of evidence that suggested an increase in the number of apnoeas with the use of positional modifiers in this population.

The studies looked at a variety of different positional modifiers, including the tennis ball technique and an electronic sleep position trainer, but the committee noted that that they did not include other devices such as lumbar or abdominal binders, semi-rigid backpacks and full-length pillows. The committee agreed that the evidence for different types of positional modifiers was insufficient to recommend a specific device.

The committee did not make a research recommendation because it was aware of several relevant research trials already in progress.

How the recommendations might affect practice

Positional modifiers are not used commonly in current practice so the recommendation would involve a change in practice by most providers. Currently people tend to buy their own positional devices, often after not tolerating CPAP or mandibular advancement splints. However, it is only an option if CPAP and mandibular advancement splints are unsuccessful so increased uptake of these devices and resource impact is likely to be small.

Return to recommendations

Surgery for OSAHS

Recommendations 1.7.3 and 1.7.4

Why the committee made the recommendations

The evidence showed that oropharyngeal surgery (including tonsillectomy) was effective in some people with moderate or severe OSAHS.

Based on their knowledge and experience the committee agreed that tonsillectomy should be prioritised in people with large obstructive tonsils, and that people with a BMI of 35 kg/m^2 or above are less likely to benefit from surgery because they are more likely to have multi-level upper airway obstruction. There was no direct evidence for people with mild OSAHS but the committee agreed that tonsillectomy should be applicable to all severities when tonsils are clearly causing obstruction.

Based on the evidence and their knowledge and experience the committee agreed that other types of oropharyngeal surgery could be an option for some people with severe OSAHS who have been unable to tolerate CPAP and a customised mandibular advancement splint. Although the evidence included people with moderate or severe OSAHS, most were in the severe category and the committee agreed that benefit was more likely in this group. There are no other treatment options for people with severe OSAHS who cannot tolerate CPAP and mandibular advancement splints, and the committee agreed that surgery for the right people would improve their quality of life. They noted that the economic analysis showed that this surgery could be cost effective if the treatment effects are maintained for 2.4 years or more. On that basis, the committee agreed that referral for oropharyngeal surgery is cost effective for carefully selected people with severe OSAHS who have been unable to tolerate other treatments.

The committee stressed that before considering referral for surgery, people should have fully explored other treatment options under medical supervision for a sufficient period of time. The committee also noted the potential risks of surgical intervention in people with severe OSAHS, and stressed that a personalised approach to patient selection is needed. This includes an assessment of anaesthetic risk and of the type and extent of surgery, which is critical because the outcome will depend on the anatomical and physiological phenotype of OSAHS. They therefore made a recommendation for referral for surgical consideration rather than surgery itself, acknowledging that precise individual assessment by the surgical team would be needed.

Because of a lack of sufficient evidence, the committee did not make any recommendations for nasal or skeletal framework surgery. They made a research recommendation on upper airway surgical interventions for people with OSAHS who

are unable to tolerate or adhere to CPAP because there was limited evidence for the applicability of this approach.

How the recommendations might affect practice

The recommendation for tonsillectomy is broadly in line with current practice.

People who are unable to tolerate or adhere to CPAP and mandibular advancement splints are not usually referred for oropharyngeal surgery, so there is likely to be a change in practice for some providers. This recommendation is likely to only affect a small minority of people with severe OSAHS who are not helped by other treatments, have few comorbidities and for whom surgery is a suitable option.

Return to recommendations

Oxygen therapy for OSAHS

There was no evidence for oxygen therapy as an adjunct to CPAP for people with OSAHS.

There was also a lack of convincing evidence in favour of oxygen therapy alone for people with moderate OSAHS and no evidence for people with mild and severe OSAHS. Therefore, the committee decided that because there is a cost associated with this treatment and no evidence of benefit they could not make a consensus recommendation for oxygen therapy for anyone with OSAHS. They agreed that a research recommendation on oxygen therapy, specifically looking at the clinical effectiveness of oxygen therapy compared with a placebo in people with OSAHS unable to tolerate CPAP would help to inform future guidance.

Managing rhinitis in people with OSAHS

Recommendations 1.8.1 to 1.8.4

Why the committee made the recommendations

There was limited evidence to demonstrate the benefits of treating rhinitis. However, the committee agreed, based on their knowledge and experience, that treating rhinitis and other causes of nasal obstruction is important and may help people use CPAP more comfortably and has a positive impact on sleep disorders. Changing the

interface from a nasal to an orofacial mask and adding humidification can also help. The committee advised that current practice should be followed for initial treatment, and that referral to an ear, nose and throat specialist may be needed for further assessment of persistent symptoms.

How the recommendations might affect practice

The recommendations reflect current practice in most NHS centres, so there is likely to be little change in practice.

Return to recommendations

Follow-up for people with OSAHS

Recommendations 1.9.1 to 1.9.8

Why the committee made the recommendations

There was limited evidence on follow-up, so the committee also used their clinical knowledge and experience to make the recommendations.

The committee noted that CPAP is just one aspect of treatment for OSAHS, and that follow-up should be tailored to the person's overall treatment plan. This may include lifestyle changes, such as weight management, modifying use of sedative drugs and alcohol, and stopping smoking, and treating underlying lung disease and other comorbidities.

Follow-up for people using CPAP

CPAP adherence patterns are usually established in the first week of therapy, therefore the committee agreed that early assessment of CPAP (within 1 month) is helpful to check adherence, for initial problem solving and to provide support. There was no evidence to suggest a difference between face-to-face, phone and video consultations, so the committee agreed that these could all be options for follow-up. The evidence also suggested that consultations with telemonitoring were as effective as those without telemonitoring. However, there was some evidence available for people with severe OSAHS that suggested adherence is improved by including telemonitoring and the committee agreed that the data could be extrapolated to people with mild and moderate OSAHS.

The committee agreed that although the available evidence did not show much benefit, in their experience telemonitoring offers significant advantages over not using telemonitoring to both clinician and the person using CPAP. These include early night-by-night access to data, which can lead to early detection of problems such as mask leaks or persistent respiratory events of sleep apnoea, and the ability to monitor control of OSAHS and adherence to therapy.

Telemonitoring makes managing a person's OSAHS more efficient for healthcare professionals because they have ready access to the person's data when needed. For example, to help identify a problem (such as, mask leak or inadequate pressure) and take action without a scheduled appointment.

The committee agreed that video and phone consultations along with telemonitoring are also advantageous in reducing the number of in-person visits needed to the sleep service. This can be particularly beneficial to people who have difficulty getting to clinics, for example, those who live in remote areas or have poor mobility. The reduction in the number of face-to-face consultations will also help reduce the risk of infection during the COVID-19 pandemic. Based on their experience, the committee agreed that subsequent follow-up should be personalised until effective CPAP treatment is established.

The committee discussed the benefits of longer term follow-up comparing annual with a 2-yearly follow-up interval once CPAP is established. They agreed that annual follow-up should be considered because it allows the opportunity to review progress, symptom control, assess adherence and effectiveness, and review the need to continue therapy. The committee also agreed that support between appointments was important in case of problems, and for providing advice, equipment and consumables.

Follow-up for people using mandibular advancement splints

No evidence was identified on monitoring for people using mandibular advancement splints. Based on experience, the committee agreed that early face-to-face follow-up, video or phone consultation is advisable for people using a mandibular advancement splint to review symptom improvement and make further adjustments to the device.

Subsequent follow-up should be personalised and include assessment of side effects and the impact on dentition and bite.

Follow-up for people using positional devices

There was no evidence on monitoring for people using positional devices, but the committee also agreed that early face-to-face follow-up, video or phone consultation is beneficial to assess symptom control and determine whether respiratory events are controlled.

Follow-up for people who have had surgery

For people who have had surgery for OSAHS, the committee agreed that follow-up should happen within 3 months and include respiratory polygraphy. Wound healing and any early inflammation should be resolved before this is considered.

Follow-up for drivers

The committee noted that annual review is required by the DVLA for Group 2 licence holders (lorry and bus drivers) with moderate or severe OSAHS and excessive sleepiness at diagnosis. For Group 1 license holders (car and motorcycle drivers) with OSAHS and excessive sleepiness, review is required at least every 3 years. For more information see the Driver and Vehicle Licensing Agency guidance on assessing fitness to drive.

How the recommendations might affect practice

Current practice includes a mixture of face-to-face, phone and video consultations and telemonitoring. The increasing number of people being offered CPAP means that providing regular outpatient follow-up has become increasingly difficult. The use of telemonitoring may increase, which is likely to reduce the need for face-to-face consultations and may reduce pressure on outpatient clinics. Increasing web- and app-based access to telemonitoring data will allow patients to access their own results and encourage self-management.

The committee noted that there has been a significant move to video and phone consultations to reduce the risk of infection during the COVID-19 pandemic, and this shift in practice is likely to persist.

The committee stressed that telemonitoring crucially involves feedback to patients and time should be available for sleep service staff to review data, act on this and share with the person using CPAP. Current practice already includes ready access to advice and CPAP equipment from sleep services.

Recommendations on monitoring for positional modifiers, mandibular advancement splints and surgery are considered to be current practice in many areas and are not expected to lead to major changes in practice.

Return to recommendations

Monitoring treatment efficacy in people with OSAHS

Recommendations 1.9.9 and 1.9.10

Why the committee made the recommendations

No evidence was available on the efficacy of treatment for OSAHS, so the recommendations are based on the committee's knowledge and experience.

The effectiveness of treatment can be confirmed by control of symptoms and AHI, and uptake and adherence to therapy. The committee identified several factors that commonly cause problems with CPAP that should be routinely reviewed if treatment is not working.

How the recommendations might affect practice

These recommendations reflect current practice and are not expected to lead to a change in practice.

Return to recommendations

Supporting adherence to treatment for OSAHS

Recommendations 1.10.1 and 1.10.2

Why the committee made the recommendations

The committee considered behavioural, supportive and educational interventions and made recommendations based on the evidence and their experience.

The evidence suggested that all types of interventions to support adherence (educational, behavioural, supportive and mixed) increased CPAP use in people starting CPAP for the first time with moderate or severe OSAHS. There was no evidence available for people with mild OSAHS, but the committee agreed that these recommendations would be applicable to all people having treatment for OSAHS.The committee agreed that educational or supportive interventions, or a combination of these, provided by specialist staff, would help to improve adherence to CPAP. Educational interventions include providing information about OSAHS, its treatment and outcomes, which can be delivered using a variety of different sessions and formats. Whereas supportive interventions involve additional clinical follow-up (for example, extra clinic visits, video or teleconsultations or use of telemonitoring) to provide support. The nature of behavioural interventions varied widely, making it difficult to identify the most effective components. Therefore, the committee could not recommend any specific behavioural interventions.

Optimal adherence to CPAP therapy is conventionally considered to be 4 hours or more per night or use for an average of more than 4 hours per night for 70% or more nights. Early adherence studies focused on control of sleepiness but there is evidence that increased CPAP use of more than 5 hours a night in OSAHS benefits other aspects of health such as control of blood pressure and cardiovascular risk. However, it is recognised that people can gain some benefit from a shorter period of use, and individual response is variable. People should be encouraged to maximise their CPAP use to achieve optimal control of their symptoms, underlying conditions, sleep quality and quality of life.

There was no evidence available for improving adherence to mandibular advancement splint and positional modifiers in OSAHS. However, the committee agreed that evidence for improving adherence for CPAP could be applied to other treatments.

Because there was no evidence for people who have difficulty using CPAP, the committee made a research recommendation on interventions to improve CPAP adherence to inform future guidance.

How the recommendations might affect practice

The recommendations reflect best practice, but current provision varies across NHS settings. Therefore, the recommendations will involve a change of practice for some providers.

Return to recommendations

When to suspect OHS

Recommendation 2.1.1

Why the committee made the recommendation

No evidence was available on identifying who to assess for OHS, so the recommendations are based on the committee's knowledge and experience.

The committee agreed that further assessment for OHS should be carried out in people with obesity together with symptoms of OSAHS or features of nocturnal hypoventilation. These criteria were chosen because some people with OHS have OSAHS, some have nocturnal hypoventilation alone, and others have combination of both. A low arterial oxygen saturation value or polycythaemia may be indicative of OHS, but raised $PaCO_2$ is needed for diagnosis (for more information see the rationale and impact section for diagnostic tests for OHS).

How the recommendation might affect practice

In current practice, not all people with the listed symptoms and features are considered for further assessment for OHS, so this recommendation may result in a change of practice for the majority of providers, leading to more testing and treatment. This will be magnified by the rising prevalence of obesity in the general population.

Return to recommendation

Assessment scales for suspected OHS

Recommendations 2.1.2 and 2.1.3

Why the committee made the recommendations

No evidence was found on assessment tools for suspected OHS, so the committee based the recommendation on their knowledge and experience. They agreed that the Epworth sleepiness scale has a useful role in monitoring and assessment of sleepiness in people with OHS. However, they noted that not all people with OHS have excessive sleepiness and that healthcare professionals may not always be aware of this.

The evidence for STOP-Bang questionnaire was limited to OSAHS only and there was no validation for its use in OHS. The committee agreed that the STOP-Bang is not used in practice for OHS so they did not make a recommendation for this.

How the recommendations might affect practice

The Epworth sleepiness scale is widely used in current practice, so the recommendations are not expected to involve a change in practice.

Return to recommendations

Prioritising people for rapid assessment by a sleep service

Recommendations 2.2.1 and 2.2.2

Why the committee made the recommendations

No evidence was available for prioritising people with OHS for referral, so the committee used their knowledge and experience to identify groups that would benefit most from prompt assessment and treatment.

The committee noted that people with a BMI over 30 kg/m^2 and severe hypercapnia or hypoxaemia should have urgent referral because they have chronic ventilatory failure and are at risk of acute decompensated ventilatory failure, both of which carry a poor prognosis.

The committee agreed that priority access to a sleep study and treatment should be offered to people in whom vigilance and alertness are vital to occupational safety, particularly those with problematic sleepiness and to people with pre-existing conditions who are at increased risk of adverse events.

The committee discussed the effect on work performance and safety for people with suspected OHS who also have OSAHS. 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. They noted that Driver and Vehicle Licensing Agency guidance on assessing fitness to drive 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 need assessment and treatment from a sleep specialist.

Pregnant women need to be referred urgently for sleep study and treatment, because uncontrolled OHS may adversely affect both the mother and baby.

The committee agreed that people with unstable cardiovascular disease should be offered early investigation and treatment, because cardiovascular complications are a major cause of mortality and morbidity in people with OHS.

The committee agreed that people with a high probability of OHS who need major surgery should be prioritised to avoid delaying surgery.

The committee also agreed that the risk of sudden blindness in patients with non-arteritic anterior ischaemic optic neuropathy warrants urgent referral because of its possible association with OHS.

To ensure that patients are prioritised appropriately by sleep services and to allow fast-tracking directly to a sleep study the committee agreed on key details, based on their experience, that should be included in referral letters.

How the recommendations might affect practice

In current practice, specific groups are not always prioritised for referral, so there is likely to be 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 providing 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.

Return to recommendations

Diagnostic tests for OHS

Recommendations 2.3.1 to 2.3.6

Why the committee made the recommendations

The committee noted that OHS is defined by the presence of $PaCO_2$ greater than 6.0 kPa while awake in people with a BMI of 30 kg/m^2 or more. There was no evidence for diagnostic tests to identify the presence of OSAHS or nocturnal hypoventilation in people with suspected OHS, so the committee also used their clinical knowledge and experience to make the recommendations.

Diagnosing OHS and assessing ventilatory failure

OHS is a specific form of chronic ventilatory failure, and by definition a measurement of $PaCO_2$ from arterial or arterialised capillary blood gas, taken while the person with suspected OHS is awake, is needed to establish the diagnosis and to assess the extent of chronic ventilatory failure. It is current practice to measure these and, although they are invasive tests, obtaining the samples is generally straightforward.

Serum venous bicarbonate indirectly reflects medium and long-term $PaCO_2$ levels. It is a simpler test to perform and a normal level is helpful in ruling out OHS if the pre-test probability of the diagnosis low. The committee therefore agreed that it could be recommended in such cases, but noted that this alone will not completely rule out OHS and that other tests are needed when clinical suspicion is high.

People with any form of chronic ventilatory failure can readily develop acute ventilatory failure if, for example, they have an intercurrent respiratory tract infection. Acute ventilatory failure is a medical emergency needing urgent treatment, and the committee agreed it is important to state that this should take priority over full investigation of any underlying chronic disease.

Diagnosing OSAHS or nocturnal hypoventilation in OHS

Diagnosis of coexisting OSAHS is needed to ensure optimal choice of treatment, and the committee agreed this should be with either hospital or home respiratory polygraphy, based on their experience and the evidence for diagnosis of OSAHS in

people without OHS (see the rationale for diagnostic tests for OSAHS). The committee agreed that transcutaneous CO_2 monitoring with respiratory polygraphy should also be considered at the same time, to help establish the severity of nocturnal hypoventilation. A markedly raised CO_2 level suggests non-invasive ventilation may be the treatment of choice rather than CPAP.

Oximetry alone is insufficient for diagnosis because it does not clearly distinguish between obstructive apnoeas and nocturnal hypoventilation.

How the recommendations might affect practice

The recommendations reflect current practice and would therefore not be expected to increase NHS cost.

Return to recommendations

Lifestyle advice for OHS

Recommendation 2.4.1

Why the committee made the recommendation

Evidence for lifestyle advice was not reviewed because it is covered by other NICE guidelines.

The committee agreed that all people with OHS should discuss lifestyle changes with their healthcare professional. This should focus on weight loss and be tailored to the person's needs and the chosen treatment method.

Lifestyle changes are important because obesity increases the prevalence and severity of OHS, smoking causes upper airway inflammation, which can exacerbate symptoms, and excess alcohol before sleep reduces upper airway tone, increasing apnoeas, and reduces sleep quality. Advice on sleep hygiene may include ensuring adequate sleep time, avoiding caffeine and stimulants that interfere with sleep before bedtime, exercising regularly, having a quiet, comfortable, darkened bedroom, and winding down before sleep.

Return to recommendation

Treatments for OHS

Recommendations 2.5.1 to 2.5.8

Why the committee made the recommendations

CPAP and non-invasive ventilation

The evidence was limited to people with OHS and severe OSAHS without acute ventilatory failure. It showed that both CPAP and non-invasive ventilation are beneficial compared with lifestyle changes, and that there was little difference in effectiveness between these treatments. There was no evidence for people with acute ventilatory failure.

Based on evidence and their experience, the committee agreed that CPAP should be offered as a first-line treatment for people with OHS and severe OSAHS who do not have acute ventilatory failure because it is more cost effective, simpler to set up and may be better tolerated than non-invasive ventilation. If symptoms do not improve, severe hypercapnia persists, AHI is not sufficiently reduced or CPAP is poorly tolerated, the committee agreed that treatment should be changed to non-invasive ventilation to control nocturnal hypoventilation.

In line with current practice, the committee agreed that non-invasive ventilation should be considered as first-line treatment for people with OHS in the absence of severe OSAHS.

Although there was no direct evidence available, the committee were clear that non-invasive ventilation should be the first-line treatment for people with OHS and acute ventilatory failure because rapid improvement in hypercapnia is a priority. A trial without non-invasive ventilation may be suitable for people in whom hypercapnia resolves. In this instance, they should remain under review in case hypercapnia recurs, and should be assessed with respiratory polygraphy on recovery to determine if long-term treatment with CPAP or non-invasive ventilation is needed. The committee agreed that people with residual OSAHS but minimal hypoventilation when stable can be switched to CPAP.

Oxygen therapy

No evidence was available for oxygen therapy in people with OHS. The committee agreed that, although optimal CPAP or non-invasive ventilation will usually be sufficient to correct ventilatory failure, some people with OHS may remain hypoxaemic during sleep despite control of AHI and nocturnal hypercapnia on CPAP or non-invasive ventilation. This would be shown on oximetry measures or on arterial blood gas during sleep. Addition of supplemental oxygen therapy to the CPAP or non-invasive ventilation during sleep may be needed to correct this hypoxia. Usually only a low flow rate such as 1 to 2 litres/minute would be needed. Repeating oximetry or arterial blood gas would allow the response to this oxygen therapy to be evaluated and any further adjustments to oxygen prescription to be made.

How the recommendations might affect practice

The use of CPAP for people with OHS is a change in practice that is likely to result in less non-invasive ventilation use.

The recommendations on oxygen therapy reflect current practice in most NHS centres, so there is likely to be little impact on practice.

Return to recommendations

Managing rhinitis in people with OHS

Recommendations 2.6.1 to 2.6.4

Why the committee made the recommendations

No evidence was available on managing rhinitis for people with OHS. The committee agreed that recommendations for OSAHS are applicable to people with OHS as well. They agreed, based on their knowledge and experience, that treating rhinitis and other causes of nasal obstruction is important and may help people use CPAP more comfortably and has a positive impact on sleep disorders. Changing the interface from a nasal to an orofacial mask and adding humidification can also help. The committee advised that current practice should be followed for initial treatment, and that referral to an ear, nose and throat specialist may be needed for further assessment of persistent symptoms.

How the recommendations might affect practice

The recommendations reflect current practice in most NHS centres, so there is likely to be little change in practice.

Return to recommendations

Follow-up for people with OHS

Recommendations 2.7.1 to 2.7.5

Why the committee made the recommendations

The committee noted that CPAP and non-invasive ventilation are just part of treatment for OHS, and that follow-up should be tailored to the person's overall treatment plan. This should also include lifestyle changes, such as weight management, modifying use of sedative drugs and alcohol, and stopping smoking, and treating underlying lung disease and other comorbidities.

Based on their knowledge and experience, the committee agreed that for people with OHS starting CPAP or non-invasive ventilation, early follow-up at 1 month is advisable to review control of symptoms, sleep disordered breathing and adherence. Problem solving can be achieved by face-to-face, video or phone consultations, and include review of telemonitoring data if available. The committee also agreed that although most studies of telemonitoring are in patients with OSAHS, and that there is not yet the ability to assess hypercapnia through telemonitoring, it is still of value for monitoring in people with OHS who also have OSAHS.

In addition to annual review, people with OSAHS and OHS having CPAP or non-invasive ventilation therapy need to be able to access a sleep service for advice and provision of consumables such as masks, circuitry and filters.

Follow-up for drivers

The committee noted that annual review is required by the DVLA for Group 2 licence holders (lorry and bus drivers) with moderate or severe OSAHS and excessive sleepiness at diagnosis. For Group 1 license holders (car and motorcycle drivers) with OSAHS and excessive sleepiness, review is required at least every 3 years. For

more information see the Driver and Vehicle Licensing Agency guidance on assessing fitness to drive.

How the recommendations might affect practice

Current practice includes a mixture of face-to-face, phone and video consultations and telemonitoring. The increasing number of people being offered CPAP means that providing regular outpatient follow-up has become increasingly difficult. In addition, a more personalised approach enables attention to be focused on people with problems adapting to therapy. Telemonitoring is included in the overall cost of CPAP devices by some manufacturers for variable periods, and is increasingly available for non-invasive ventilators. The committee discussed that routine use of telemonitoring should reduce the need for face-to-face consultations, and reduce pressure on outpatient clinics, but feedback and discussion with patients is still needed. Increasing web- and app-based access to telemonitoring data will allow patients to access their own results to aid self-care.

The committee noted that there has been a significant move to video and phone consultations to reduce the risk of infection during the COVID-19 pandemic, and this shift in practice is likely to persist.

Return to recommendations

Monitoring treatment efficacy for people with OHS

Recommendations 2.7.6 to 2.7.8

Why the committee made the recommendations

No evidence was available for demonstrating efficacy of treatment for OHS, so the recommendations are based on the committee's knowledge and experience.

In OHS, control of nocturnal hypoventilation is demonstrated by improvement of symptoms, hypercapnia when awake and asleep, and oxygenation. It is important to optimise these to improve wellbeing and prognosis, and to reduce the risk of hospital admission.

The committee agreed that clinical effectiveness of CPAP and non-invasive ventilation in people with OHS should be assessed by reviewing symptoms of

OSAHS and nocturnal hypoventilation including Epworth sleepiness score, AHI, adherence to therapy, improvement in oxygenation and hypercapnia while awake and asleep, and telemonitoring or download information from the CPAP or non-invasive ventilation device.

The committee agreed that the understanding and experience of people having CPAP or non-invasive ventilation should be explored, and factors that commonly cause problems should be reviewed.

The committee highlighted that in people with OHS, the need for oxygen therapy and adherence to this should be reviewed after treatment with non-invasive ventilation or CPAP has been optimised.

How the recommendations might affect practice

These recommendations reflect current practice and are not expected to lead to major changes in practice.

Return to recommendations

Supporting adherence to treatment for OHS

Recommendations 2.8.1 and 2.8.2

Why the committee made the recommendations

There was no evidence available for people with OHS. The committee agreed that the evidence reviewed for supporting adherence to CPAP in people with OSAHS could be extrapolated to treatments in people with OHS.

How the recommendations might affect practice

The recommendations reflect best practice but are currently implemented to varying degrees across NHS settings and will involve a change of practice for some providers.

Return to recommendations

When to suspect COPD–OSAHS overlap syndrome

Recommendation 3.1.1

Why the committee made the recommendation

No evidence was available for when to suspect COPD–OSAHS overlap syndrome, so the recommendations are based on the committee's knowledge and experience.

COPD–OSAHS overlap syndrome describes the combination of COPD and OSAHS. These are 2 of the most prevalent pulmonary conditions and therefore the combination is likely to be common. Hypoxaemia due to COPD is exacerbated during sleep by OSAHS, which may worsen prognosis and symptom burden. The committee agreed that a sleep history should be taken and further assessment for OSAHS carried out in people with COPD presenting with common symptoms and features of either OSAHS or nocturnal hypoventilation. The type of symptoms, nature of sleep disordered breathing and outcome will be affected by the relative severity of COPD and OSAHS.

How the recommendation might affect practice

It is estimated that COPD–OSAHS overlap syndrome has a prevalence of approximately 1% and is currently under recognised. In current practice, not all people with the symptoms and features of OSAHS listed in the recommendation are considered for further assessment for COPD–OSAHS overlap syndrome, hence implementation of these recommendations may change practice for the majority of providers. A growth in referrals for sleep study is anticipated with an increased understanding of the impact of COPD–OSAHS overlap syndrome. As a result of increased diagnosis, CPAP and non-invasive ventilation use may increase. Treatment in turn may reduce acute admissions and long-term complications.

Return to recommendation

Assessment scales and tests for suspected COPD–OSAHS overlap syndrome

Recommendations 3.1.2 to 3.1.5

Why the committee made the recommendations

There was limited evidence on assessment tools for suspected COPD–OSAHS overlap syndrome, so the committee also used their knowledge and collective experience to make the recommendations.

The Epworth sleepiness scale is intended to assess for sleepiness and the limited evidence reflected this, showing that it had moderate sensitivity and low specificity for diagnosing COPD–OSAHS overlap syndrome. The committee noted that some people with this syndrome do not have excessive sleepiness and that not all healthcare professionals are aware of this. However, they agreed that it has a useful role in assessment and monitoring, and noted that when healthcare professionals are requested by the DVLA to complete assessment of a driver with OSAHS (which will include those with COPD–OSAHS overlap syndrome) this includes the Epworth sleepiness scale.

Limited evidence showed that STOP-Bang questionnaire had high sensitivity and low specificity for diagnosing COPD–OSAHS overlap syndrome. Sensitivity is a priority for questionnaires used for initial assessment. The committee had some concerns about its accuracy in people with less common presentations and in women, but agreed that it could have a role in assessment, alongside the Epworth sleepiness scale, to inform the preliminary understanding of the persons' symptoms and concerns. The Epworth questionnaire is used to assess only sleepiness whereas STOP-Bang questionnaire is used to assess risk of having OSAHS and includes parameters such as: snoring, tiredness, history of high blood pressure, BMI, age, neck size and gender. With this in mind the committee recommended using the Epworth questionnaire and to consider using the STOP-Bang questionnaire.

Spirometry is routinely measured in clinical practice to assess the severity of COPD, and aids the understanding of the relative contribution of COPD and OSAHS to symptom load and pathophysiology.

How the recommendations might affect practice

The Epworth sleepiness scale and STOP-Bang questionnaire are widely used in current practice, and spirometry is routinely used in the assessment of COPD, so the recommendations are not expected to involve a change in practice.

Return to recommendations

Prioritising people for rapid assessment by a sleep service

Recommendations 3.2.1 and 3.2.2

Why the committee made the recommendations

No evidence was available for prioritising people with COPD–OSAHS overlap syndrome for referral, so the committee used their knowledge and experience to identify groups that would benefit most from prompt assessment and treatment.

The committee noted that people with suspected COPD–OSAHS overlap syndrome who have severe hypercapnia or hypoxaemia should have early referral because they have chronic ventilatory failure, and are at risk of acute decompensated ventilatory failure, both of which carry a poor prognosis.

The committee agreed that priority access to a sleep study and treatment should be offered to people in whom vigilance and alertness are vital to occupational safety, particularly those with problematic sleepiness and to people with pre-existing conditions who are at increased risk of adverse events.

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. The committee noted that Driver and Vehicle Licensing Agency guidance on assessing fitness to drive 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 need assessment and treatment from a sleep specialist.

Pregnant women with suspected COPD–OSAHS overlap syndrome need to be referred urgently for early sleep study and treatment because overlap syndrome may be associated with poor outcomes for mothers and babies.

People with suspected COPD–OSAHS overlap syndrome and unstable cardiovascular disease need early investigation and treatment, because cardiovascular complications may be a major cause of mortality and morbidity in overlap syndrome.

The committee agreed that people with a high probability of COPD–OSAHS overlap syndrome who need major surgery should be prioritised to avoid delaying surgery.

The committee also agreed that the risk of sudden blindness in patients with non-arteritic anterior ischaemic optic neuropathy warrants urgent referral because of its possible association with COPD–OSAHS overlap syndrome.

To ensure that patients are prioritised appropriately by sleep services and to allow fast-tracking directly to a sleep study the committee agreed on key details, based on their experience, that should be included in referral letters.

How the recommendations might affect practice

In current practice, specific groups are not always prioritised for referral, so there is likely to be 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 providing 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.

Return to recommendations

Diagnostic tests for COPD–OSAHS overlap syndrome

Recommendations 3.3.1 to 3.3.5

Why the committee made the recommendations

There was little evidence for diagnostic tests in people with COPD–OSAHS overlap syndrome, so the committee used their clinical knowledge and experience, and the evidence on testing for OSAHS, to make the recommendations.

Diagnosing ventilatory failure

The committee agreed that arterial or arterialised capillary blood gas measurement is needed to assess for ventilatory failure. People with any form of chronic ventilatory failure can readily develop acute ventilatory failure if, for example, they have an intercurrent respiratory tract infection. Acute ventilatory failure is a medical emergency needing urgent treatment, and the committee agreed it important to state that this should take priority over full investigation of any underlying chronic disease.

The committee agreed that arterial blood gas and arterialised capillary blood gas measurements give precise information about oxygen and carbon dioxide levels and information about acid–base balance at the point in time they are taken. It is current practice to use them and they are generally straightforward to measure.

Diagnosing OSAHS or nocturnal hypoventilation in COPD–OSAHS overlap syndrome

Respiratory polygraphy (either in hospital or at home) is recommended to establish the presence and severity of OSAHS and nocturnal hypoventilation, and help determine the most suitable treatment (such as non-invasive ventilation or CPAP). The committee agreed that transcutaneous CO_2 monitoring with respiratory polygraphy should also be considered to help confirm nocturnal hypoventilation and severity of hypercapnia. Adding transcutaneous CO_2 monitoring with respiratory polygraphy may also help to define the relative contributions of COPD and OSAHS and therefore guide treatment choices and titration of settings. The person needs to have stable COPD, without recent exacerbations, before a clear diagnosis can be established.

Oximetry alone should not be used to diagnose OSAHS in this population because people with COPD are more likely to have a degree of hypoxaemia when awake, and therefore more easily exhibit falls in oxygen saturation level during sleep, making identification of apnoea episodes more difficult.

How the recommendations might affect practice

The recommendations reflect current practice.

Return to recommendations

Treatments for COPD–OSAHS overlap syndrome

Recommendations 3.5.1 to 3.5.5

Why the committee made the recommendations

CPAP and non-invasive ventilation

No evidence was identified for CPAP or non-invasive ventilation for people with COPD–OSAHS overlap syndrome, so the recommendations are based on the committee's knowledge and experience.

The committee agreed that treatment for this population depends on the level of hypercapnia when awake and asleep. People with more severe daytime hypercapnia ($PaCO_2$ greater than 7 kPa) caused by nocturnal hypoventilation, are likely to need non-invasive ventilation. This is based on extrapolation from data, not reviewed for this guideline but known to the committee from on people with COPD without OSAHS. In these people, definite benefit of non-invasive ventilation has not been demonstrated when hypercapnia is modest ($PaCO_2$ between 6 and 7 kPa, and not associated with exacerbation of COPD). The committee therefore recommended that CPAP should be considered in people with COPD–OSAHS overlap syndrome if they have confirmed OSAHS from a sleep study and if their $PaCO_2$ is less than or equal to 7.0 kPa, and non-invasive ventilation should be considered if the $PaCO_2$ is higher.

The committee also made a research recommendation on the optimal treatment for people with COPD–OSAHS overlap syndrome to inform future guidance.

Based on their experience of current practice, the committee agreed that using humidification with CPAP for people with COPD–OSAHS overlap syndrome who have nasal symptoms may reduce side effects associated with upper airway dryness and this may improve adherence and treatment effectiveness.

For all treatments the committee highlighted the importance of assessing response to treatment.

Oxygen therapy

No evidence was available for oxygen therapy in people with COPD–OSAHS overlap syndrome. Some people will be established users of long-term oxygen therapy, in

which case their supplemental oxygen can be given by CPAP or non-invasive ventilation while sleeping, with oxygen flow rate and non-invasive ventilation or CPAP settings titrated during respiratory polygraphy, according to individual need.

People with COPD–OSAHS overlap syndrome are subject to greater falls in oxygen saturation while sleeping than those with COPD alone, and the committee therefore agreed that people with COPD–OSAHS overlap syndrome who do not fulfil the criteria for long-term oxygen therapy may need supplemental oxygen therapy during sleep if they remain hypoxaemic despite control of AHI and nocturnal hypercapnia on CPAP or non-invasive ventilation.

How the recommendations might affect practice

The recommendations reflect current practice.

Return to recommendations

Mandibular advancement splints for people with COPD–OSAHS overlap syndrome

There was no evidence for the use of mandibular advancement splints in people with COPD–OSAHS overlap syndrome. The committee discussed whether evidence from people with OSAHS could be used for people with COPD–OSAHS overlap syndrome, but they agreed that the differences between these 2 groups are too great to allow them to make a consensus recommendation based on this evidence.

The committee were also aware of the potential risks of the long-term use of mandibular advancement splints. People with COPD–OSAHS overlap syndrome are generally older and have poorer dentition which makes mandibular advancement splints less likely to be effective. They also agreed that people with COPD–OSAHS overlap syndrome are also at risk of, or have ventilatory failure and mandibular advancements splints are not appropriate in those circumstances.

Full details of the evidence and the committee's discussion are in evidence review G: oral devices.

Follow up for people with COPD–OSAHS overlap syndrome

Recommendations 3.7.1 to 3.7.5

Why the committee made the recommendations

The committee noted that CPAP and non-invasive ventilation are just part of treatment for COPD–OSAHS overlap syndrome, and that follow-up should be tailored to the person's overall treatment plan. This should also include lifestyle changes, such as weight management, modifying use of sedative drugs and alcohol, and stopping smoking, and treating underlying lung disease and other comorbidities. For some people, it may also include discussions about care planning (for example COPD exacerbation action plan and advance care planning) for those with severe COPD.

Based on their knowledge and experience, the committee agreed that for people with COPD–OSAHS overlap syndrome starting CPAP or non-invasive ventilation, early follow-up is advisable to review control of symptoms, sleep disordered breathing and adherence. Problem solving can be achieved by face-to-face consultations, video or phone consultations, and include review of telemonitoring data if available. The committee also agreed that although most studies of telemonitoring are in people with OSAHS, and that there is not yet the ability to assess hypercapnia through telemonitoring, it is still of value for monitoring in people with COPD–OSAHS overlap syndrome.

In addition to their 6-monthly or annual review, people with COPD–OSAHS overlap syndrome having CPAP or non-invasive ventilation need to be able to access to a sleep service for advice, and provision of consumables such as masks, circuitry and filters.

Follow-up for drivers

The committee noted that annual review is required by the DVLA for Group 2 licence holders (lorry and bus drivers) with moderate or severe OSAHS and excessive sleepiness at diagnosis. For Group 1 license holders (car and motorcycle drivers) with OSAHS and excessive sleepiness, review is required at least every 3 years. For

more information see the Driver and Vehicle Licensing Agency guidance on assessing fitness to drive.

How the recommendations might affect practice

Current practice includes a mixture of face-to-face, phone, video consultations and telemonitoring. The increasing number of people being offered CPAP and non-invasive ventilation means that regular outpatient follow-up becomes difficult for sleep services to provide. In addition, a more personalised approach enables attention to be focused on people with problems adapting to therapy. Telemonitoring is included in the overall cost of CPAP devices by some manufacturers for variable periods. The committee discussed that routine use of telemonitoring should reduce the need for face-to-face consultations, and reduce pressure on outpatient clinics, but feedback and discussion with patients is still needed. Increasing web- and app-based access to telemonitoring data will allow patients to access their own results to aid self-care.

The committee noted that there has been a significant move to video and phone consultations to reduce the risk of infection during the COVID-19 pandemic, and this shift in practice is likely to persist.

Return to recommendations

Monitoring treatment efficacy for people with COPD–OSAHS overlap syndrome

Recommendations 3.7.6 to 3.7.10

Why the committee made the recommendations

No evidence was available on efficacy of treatment for COPD–OSAHS overlap syndrome, so the recommendations are based on the committee's knowledge and experience.

In COPD–OSAHS overlap syndrome, control of nocturnal hypoventilation is demonstrated by normalisation of daytime and night time oxygenation and hypercapnia; this is important to improve prognosis.

The committee agreed that clinical effectiveness of CPAP and non-invasive ventilation in people with COPD–OSAHS overlap syndrome should be assessed by reviewing symptoms of OSAHS and nocturnal hypoventilation including Epworth sleepiness score, AHI, adherence to therapy, improvement in oxygenation and hypercapnia (if present) while awake and asleep, and telemonitoring or download information from CPAP or non-invasive ventilation device. The committee agreed that the understanding and experience of people having CPAP and non-invasive ventilation should be explored, and factors that commonly cause problems should be reviewed. They noted that sleep quality may be poor in COPD patients, with disruption from cough, wheeze, restless legs and medication.

The committee highlighted that in people with COPD–OSAHS overlap syndrome who are already having supplemental oxygen therapy, the need for oxygen therapy should be reviewed after treatment with non-invasive ventilation or CPAP has been optimised. Effective treatment with CPAP or non-invasive ventilation may improve the person's condition to the extent that they no longer fulfil the critieria for supplemental oxygen.

In some patients with severe COPD and COPD–OSAHS overlap syndrome, optimised treatment of the OSAHS may produce an objective improvement in indices such as the AHI or oxygen desaturation during sleep, but fail to improve symptoms or quality of life for the person. This would usually be because the severity of the person's COPD has the overriding influence on quality of life. Because use of non-invasive ventilation or CPAP equipment adds to the burden of therapy, consideration should be given to stopping these and using a symptom-management approach. This needs careful discussion with the person and their family or carers, including consideringf what they would like to do for COPD exacerbations and advance care planning when appropriate.

How the recommendations might affect practice

These recommendations reflect current practice and are not expected to lead to major changes in practice.

Return to recommendations

Supporting adherence to treatment for people with COPD–OSAHS overlap syndrome

Recommendations 3.8.1 and 3.8.2

Why the committee made the recommendations

There was no evidence available for people with COPD–OSAHS overlap syndrome. The committee agreed that the evidence reviewed for supporting adherence to CPAP in people with OSAHS could be extrapolated to treatments in people with COPD–OSAHS overlap syndrome.

How the recommendations might affect practice

The recommendations reflect best practice but are currently implemented to varying degrees across NHS settings and will involve a change of practice for some providers.

Return to recommendations

Information for people with OSAHS, OHS and COPD–OSAHS overlap syndrome

Recommendations 4.1.1 to 4.1.5

Why the committee made the recommendations

There was limited evidence from clinical studies on the information and support needs of people with OSAHS, and no evidence for people with OHS and COPD–OSAHS overlap syndrome, so the committee also used their clinical knowledge and experience to make the recommendations.

The committee discussed that providing appropriate information for people with OSAHS, OHS and COPD–OSAHS overlap syndrome is essential to help them understand their condition and access support and treatment. Attendance for sleep investigation, such as respiratory polygraphy, is likely to be higher if patients understand why these are being performed and what they entail.

The committee agreed that information about all aspects of treatment is likely to increase uptake and therefore effectiveness.

The committee noted that different sleep services provide their own information and were aware of useful resources produced by a number of organisations providing support to patients.

How the recommendations might affect practice

The recommendations reflect current best practice.

Return to recommendations

Context

This guideline covers obstructive sleep apnoea/hypopnoea syndrome (OSAHS), obesity hypoventilation syndrome (OHS) and COPD–OSAHS overlap syndrome, providing advice on investigating and managing these related conditions.

OSAHS is a common, but frequently unrecognised cause of serious disability that has important health and social consequences. It is characterised by recurrent episodes of complete or partial upper airway obstruction during sleep resulting in dips in oxygen level, autonomic dysfunction and sleep fragmentation. There are a number of clinical and physiological variants (phenotypes) of the condition which may influence treatment response.

OHS occurs when people who are obese are unable to breathe rapidly or deeply enough, resulting in low oxygen levels and high blood carbon dioxide levels. It is usually associated with OSAHS or nocturnal hypoventilation, and people with OHS often have cardiovascular complications and other comorbidities.

COPD–OSAHS overlap syndrome is the coexistence of OSAHS and chronic obstructive pulmonary disease (COPD), which combined can cause a greater degree of oxygen deficiency, and increased morbidity, compared with either condition alone.

These conditions can have a profound impact on people's lives, causing excessive sleepiness or sleep disturbance that affects social activities, work performance, the ability to drive safely and quality of life. Undiagnosed, these conditions are closely associated with serious health problems, including hypertension, diabetes, stroke and heart disease, and can shorten life expectancy.

High numbers of the population are affected by these conditions, and they are often undiagnosed; it is estimated that 5% of adults in the UK have undiagnosed OSAHS. Both COPD and OSAHS are common conditions and are estimated to coexist, as overlap syndrome, in about 1% of the adult UK population. OHS is of particular concern because of rising obesity; it is already estimated to affect 0.3% to 0.4% of the UK population, with prevalence likely to grow.

The availability of services for investigation and management is variable. Failure to treat these conditions can result in increased use of services and may leave people with reduced quality of life. Highly effective treatment, in the form of continuous positive airway pressure (CPAP), is available. But approaches to CPAP therapy differ and there is a lack of guidance on when other forms of treatment, such as non-invasive ventilation, oral devices, lifestyle changes and surgery are effective. Adherence to therapy is known to be low, so advice on interventions to help with adherence is also a priority for this guideline.

This guideline is needed to improve recognition and management of OSAHS, OHS and COPD–OSAHS overlap syndrome, and ensure consistent provision of care. It gives advice to healthcare professionals on when and how to investigate, and how to manage each of these conditions. It also gives guidance on supporting people to adhere to treatment and providing follow-up.

Finding more information and committee details

To find NICE guidance on related topics, including guidance in development, see the NICE webpage on sleep and sleep conditions.

For details of the guideline committee see the committee member list.